1.1.2 The institution adheres to the academic calendar including for the conduct of CIE

ACADEMIC YEAR 2022-2023

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INSTITUTION ACADEMIC CALENDAR FOR THE ODD SEMESTER 2022 - 2023

DATE	DAY	PARTICULARS
01-Jun-22	Wednesday	
02-Jun-22	Thursday	
03-Jun-22	Friday	
04-Jun-22	Saturday	
05-Jun-22	Sunday	Holiday
06-Jun-22	Monday	
07-Jun-22	Tuesday	
08-Jun-22	Wednesday	
09-Jun-22	Thursday	INTERNAL ASSESSMENT – II (UG IV SEM & PG (MCA, MBA & ME)
10-Jun-22	Friday	International Yoga Day 2022 conducted by EEE Department / INTERNAL ASSESSMENT – II (UG IV SEM & PG (MCA, MBA & ME)
11-Jun-22	Saturday	INTERNAL ASSESSMENT – II (UG IV SEM & PG (MCA, MBA & ME)
12-Jun-22	Sunday	Holiday
13-Jun-22	Monday	INTERNAL ASSESSMENT – II (UG II & III Year)
14-Jun-22	Tuesday	INTERNAL ASSESSMENT – II (UG II & III Year)
15-Jun-22	Wednesday	INTERNAL ASSESSMENT – II (UG II & III Year)
16-Jun-22	Thursday	
17-Jun-22	Friday	
18-Jun-22	Saturday	
19-Jun-22	Sunday	Holiday
20-Jun-22	Monday	
21-Jun-22	Tuesday	
22-Jun-22	Wednesday	
23-Jun-22	Thursday	
24-Jun-22	Thursday	
25-Jun-22	Saturday	
26-Jun-22	Sunday	Holiday
27-Jun-22	Monday	Commencement of EVEN Semester Classes For PG (ME) I Year II Sem
28-Jun-22	Tuesday	
29-Jun-22	Wednesday	
30-Jun-22	Thursday	INTERNAL ASSESSMENT – III (UG IV SEM & PG (MCA, MBA & ME) / INTERNAL ASSESSMENT – II (UG II SEM
01-Jul-22	Friday	INTERNAL ASSESSMENT – III (UG IV SEM & PG (MCA, MBA & ME) / INTERNAL ASSESSMENT – II (UG II SEM
02-Jul-22	Saturday	INTERNAL ASSESSMENT – III (UG IV SEM & PG (MCA, MBA & ME) / INTERNAL ASSESSMENT – II (UG II SEM
03-Jul-22	Sunday	Holiday
04-Jul-22	Monday	
05-Jul-22	Tuesday	

DATE	DAY	PARTICULARS
06-Jul-22	Wednesday	
07-Jul-22	Thursday	
08-Jul-22	Friday	
09-Jul-22	Saturday	Holiday
10-Jul-22	Sunday	Holiday
11-Jul-22	Monday	
12-Jul-22	Tuesday	
13-Jul-22	Wednesday	
14-Jul-22	Thursday	
15-Jul-22	Friday	
16-Jul-22	Saturday	
17-Jul-22	Sunday	Holiday
18-Jul-22	Monday	
19-Jul-22	Tuesday	
20-Jul-22	Wednesday	
21-Jul-22	Thursday	
22-Jul-22	Friday	
23-Jul-22	Saturday	
24-Jul-22	Sunday	Holiday
25-Jul-22	Monday	
26-Jul-22	Tuesday	
27-Jul-22	Wednesday	
28-Jul-22	Thursday	
29-Jul-22	Friday	
30-Jul-22	Saturday	
31-Jul-22	Sunday	Holiday
01-Aug-22	Monday	
02-Aug-22	Tuesday	
03-Aug-22	Wednesday	Holiday (AADI Festival)
04-Aug-22	Thursday	
05-Aug-22	Friday	INTERNAL ASSESSMENT – I (PG ME II SEM)
06-Aug-22	Saturday	Holiday
07-Aug-22	Sunday	Holiday
08-Aug-22	Monday	INTERNAL ASSESSMENT – I (PG ME II SEM)
09-Aug-22	Tuesday	Holiday (Muharram)

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DATE	DAY	PARTICULARS
10-Aug-22	Wednesday	Commencement of ODD Semester Classes For UG (III Year V Sem & IV Year VII Sem) / INTERNAL ASSESSMENT – I (PG ME II SEM) / 75TH Independence Day 2022 conducted by LITERARY CLUB
11-Aug-22	Thursday	INTERNAL ASSESSMENT – I (PG ME II SEM)
12-Aug-22	Friday	INTERNAL ASSESSMENT – I (PG ME II SEM)
13-Aug-22	Saturday	
14-Aug-22	Sunday	Holiday
15-Aug-22	Monday	Holiday (Independence Day)
16-Aug-22	Tuesday	
17-Aug-22	Wednesday	
18-Aug-22	Thursday	
19-Aug-22	Friday	Holiday (Krishna Jayanthi)
20-Aug-22	Saturday	Holiday
21-Aug-22	Sunday	Holiday
22-Aug-22	Monday	Commencement of ODD Semester Classes For UG (II Year III Sem)
23-Aug-22	Tuesday	
24-Aug-22	Wednesday	NATIONAL PHOTOGRAPHY DAY Conducted By Photography Club / Civil Department
25-Aug-22	Thursday	
26-Aug-22	Friday	Local Holiday
27-Aug-22	Saturday	FINE ARTS CLUB Inauguration Conducted By CSE & IT Department
28-Aug-22	Sunday	Holiday
29-Aug-22	Monday	
30-Aug-22	Tuesday	
31-Aug-22	Wednesday	Holiday (Vinayakar Chaturthi)
01-Sep-22	Thursday	Commencement of ODD Semester Classes For MBA III Sem
02-Sep-22	Friday	
03-Sep-22	Saturday	
04-Sep-22	Sunday	Holiday
05-Sep-22	Monday	
06-Sep-22	Tuesday	
07-Sep-22	Wednesday	
08-Sep-22	Thursday	
09-Sep-22	Friday	
10-Sep-22	Saturday	
11-Sep-22	Sunday	Holiday
12-Sep-22	Monday	
13-Sep-22	Tuesday	
14-Sep-22	Wednesday	
15-Sep-22	Thursday	
16-Sep-22	Friday	
17-Sep-22	Saturday	
18-Sep-22	Sunday	Holiday
19-Sep-22	Monday	
20-Sep-22	Tuesday	
21-Sep-22	Wednesday	
22-Sep-22	Thursday	
23-Sep-22	Friday	
24-Sep-22	Saturday	
25-Sep-22	Sunday	Holiday
26-Sep-22	Monday	INTERNAL ASSESSMENT – II (PG ME II SEM) / INTERNAL ASSESSMENT – I (UG III Year & IV Year)
27-Sep-22	Tuesday	INTERNAL ASSESSMENT – II (PG ME II SEM) / INTERNAL ASSESSMENT – I (UG III Year & IV Year)
28-Sep-22	Wednesday	INTERNAL ASSESSMENT – II (PG ME II SEM) / INTERNAL ASSESSMENT – I (UG III Year & IV Year)
29-Sep-22	Thursday	INTERNAL ASSESSMENT – II (PG ME II SEM)
30-Sep-22	Friday	INTERNAL ASSESSMENT – II (PG ME II SEM)
01-Oct-22	Saturday	Holiday (Pooja)
02-Oct-22	Sunday	
03-Oct-22	Monday	
04-Oct-22	Tuesday	

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DATE	DAY	PARTICULARS
05-Oct-22	Wednesday	Holiday (Pooja)
06-Oct-22	Thursday	
07-Oct-22	Friday	
08-Oct-22	Saturday	
09-Oct-22	Sunday	Holiday
10-Oct-22	Monday	INTERNAL ASSESSMENT – I (UG II Year III Sem) / POSTER MAKING COMPETITION Conducted By ELECTORAL LITERACY CLUB / EEE Department / Commencement of ODD Semester Classes For PG (ME & MBA I Year)
11-Oct-22	Tuesday	INTERNAL ASSESSMENT – I (UG II Year III Sem)
12-Oct-22	Wednesday	INTERNAL ASSESSMENT – I (UG II Year III Sem)
13-Oct-22	Thursday	INTERNAL ASSESSMENT – I (UG II Year III Sem)
14-Oct-22	Friday	INTERNAL ASSESSMENT – I (UG II Year III Sem)
15-Oct-22	Saturday	INTERNAL ASSESSMENT – I (UG II Year III Sem)
16-Oct-22	Sunday	Holiday
17-Oct-22	Monday	
18-Oct-22	Tuesday	
19-Oct-22	Wednesday	INTERNAL ASSESSMENT – I (PG MBA II Year III Sem) / Commencement of ODD Semester Classes For PG (MCA I Year & II Year)
20-Oct-22	Thursday	INTERNAL ASSESSMENT – II (UG III Year & IV Year) / INTERNAL ASSESSMENT – I (PG MBA III Sem)
21-Oct-22	Friday	INTERNAL ASSESSMENT – II (UG III Year & IV Year) / INTERNAL ASSESSMENT – I (PG MBA III Sem)
22-Oct-22	Saturday	Holiday (Diwali)
23-Oct-22	Sunday	
24-Oct-22	Monday	
25-Oct-22	Tuesday	
26-Oct-22	Wednesday	INTERNAL ASSESSMENT – II (UG III Year & IV Year) / INTERNAL ASSESSMENT – I (PG MBA III Sem)
27-Oct-22	Thursday	
28-Oct-22	Friday	
29-Oct-22	Saturday	
30-Oct-22	Sunday	Holiday
31-Oct-22	Monday	
01-Nov-22	Tuesday	
02-Nov-22	Wednesday	

DATE	DAY	PARTICULARS
03-Nov-22	Thursday	
04-Nov-22	Friday	WOMEN'S EMPOWERMENT PROGRAMME Conducted By WEC Club
05-Nov-22	Saturday	Holiday
06-Nov-22	Sunday	Holiday
07-Nov-22	Monday	
08-Nov-22	Tuesday	
09-Nov-22	Wednesday	
10-Nov-22	Thursday	
11-Nov-22	Friday	
12-Nov-22	Saturday	
13-Nov-22	Sunday	Holiday
14-Nov-22	Monday	
15-Nov-22	Tuesday	
16-Nov-22	Wednesday	
17-Nov-22	Thursday	INTERNAL ASSESSMENT – III (UG III Year & IV Year)
18-Nov-22	Friday	INTERNAL ASSESSMENT – III (UG III Year & IV Year)
19-Nov-22	Saturday	INTERNAL ASSESSMENT – III (UG III Year & IV Year)
20-Nov-22	Sunday	Holiday
21-Nov-22	Monday	Commencement of Practical Examinations for UG III Year & IV Year
22-Nov-22	Tuesday	
23-Nov-22	Wednesday	
24-Nov-22	Thursday	
25-Nov-22	Friday	
26-Nov-22	Saturday	
27-Nov-22	Sunday	Holiday
28-Nov-22	Monday	INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E) / Commencement of ODD Semester Classes For UG I Year
29-Nov-22	Tuesday	INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)
30-Nov-22	Wednesday	INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)
01-Dec-22	Thursday	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)

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DATE	DAY	PARTICULARS
02-Dec-22	Friday	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)
03-Dec-22	Saturday	Holiday
04-Dec-22	Sunday	Holiday
05-Dec-22	Monday	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I & II Year MCA)
06-Dec-22	Tuesday	INTERNAL ASSESSMENT – II (UG II Year III Sem) / Last Working Day for UG III Year & IV Year / INTERNAL ASSESSMENT – I (PG I & II Year / MCA)
07-Dec-22	Wednesday	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I & II Year / MCA)
08-Dec-22	Thursday	INTERNAL ASSESSMENT – I (PG I & II Year / MCA)
09-Dec-22	Friday	INTERNAL ASSESSMENT – I (PG I & II Year / MCA)
10-Dec-22	Saturday	INTERNAL ASSESSMENT – I (PG I & II Year / MCA)
11-Dec-22	Sunday	Holiday
12-Dec-22	Monday	Commencement of ODD Semester Classes For PG (ME II Year III SEM)
13-Dec-22	Tuesday	
14-Dec-22	Wednesday	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)
15-Dec-22	Thursday	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)
16-Dec-22	Friday	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)
17-Dec-22	Saturday	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)
18-Dec-22	Sunday	Holiday
19-Dec-22	Monday	Last Working Day For MBA II Year
20-Dec-22	Tuesday	
21-Dec-22	Wednesday	
22-Dec-22	Thursday	
23-Dec-22	Friday	
24-Dec-22	Saturday	
25-Dec-22	Sunday	Holiday
26-Dec-22	Monday	
27-Dec-22	Tuesday	Last Working Day For UG (II Year)
28-Dec-22	Wednesday	

DATE	DAY	PARTICULARS
29-Dec-22	Thursday	
30-Dec-22	Friday	
31-Dec-22	Saturday	
01-Jan-23	Sunday	Holiday
02-Jan-23	Monday	
03-Jan-23	Tuesday	
04-Jan-23	Wednesday	
05-Jan-23	Thursday	
06-Jan-23	Friday	
07-Jan-23	Saturday	
08-Jan-23	Sunday	Holiday
09-Jan-23	Monday	
10-Jan-23	Tuesday	
11-Jan-23	Wednesday	
12-Jan-23	Thursday	
13-Jan-23	Friday	
14-Jan-23	Saturday	Holiday (Pongal)
15-Jan-23	Sunday	
16-Jan-23	Monday	
17-Jan-23	Tuesday	
18-Jan-23	Wednesday	
19-Jan-23	Thursday	Commencement of Practical Examinations For UG II YEAR & PG MBA II YEAR
20-Jan-23	Friday	INTERNAL ASSESSMENT – I (UG I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)
21-Jan-23	Saturday	INTERNAL ASSESSMENT – I (UG I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)
22-Jan-23	Sunday	Holiday
23-Jan-23	Monday	INTERNAL ASSESSMENT – I (UG I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)
24-Jan-23	Tuesday	INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)

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INSTITUTION ACADEMIC CALENDAR FOR THE EVEN SEMESTER 2022 - 2023

DATE	DAY	PARTICULARS
25-Jan-23	Wednesday	Last Working Day For PG (MBA & M>E I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)
26-Jan-23	Thursday	Holiday (Republic Day)
27-Jan-23	Friday	Commencement of Practical Examinations for MBA & M.E I Year / INTERNAL ASSESSMENT – I (PG II Year - M.E)
28-Jan-23	Saturday	INTERNAL ASSESSMENT – I (PG II Year - M.E)
29-Jan-23	Sunday	Holiday
30-Jan-23	Monday	INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)
31-Jan-23	Tuesday	INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)
01-Feb-23	Wednesday	Commencement of EVEN Semester Classes For UG (II , III Year & IV Year / IV/VI/VIII - SEM) / INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)
02-Feb-23	Thursday	INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)
03-Feb-23	Friday	Last Working Day for MCA ODD SEM - I & III / INTERNAL ASSESSMENT – II (PG I & II Year / MCA)
04-Feb-23	Saturday	Holiday
05-Feb-23	Sunday	Holiday
06-Feb-23	Monday	Commencement of Practical Examinations for MCA I Year & II Year
07-Feb-23	Tuesday	
08-Feb-23	Wednesday	
09-Feb-23	Thursday	
10-Feb-23	Friday	
11-Feb-23	Saturday	
12-Feb-23	Sunday	Holiday
13-Feb-23	Monday	SPEECH COMPETITION for World Radio Station Day By ECE Department
14-Feb-23	Tuesday	
15-Feb-23	Wednesday	
16-Feb-23	Thursday	
17-Feb-23	Friday	
18-Feb-23	Saturday	
19-Feb-23	Sunday	Holiday

DATE	DAY	PARTICULARS
20-Feb-23	Monday	
21-Feb-23	Tuesday	
22-Feb-23	Wednesday	
23-Feb-23	Thursday	
24-Feb-23	Friday	
25-Feb-23	Saturday	
26-Feb-23	Sunday	Holiday
27-Feb-23	Monday	
28-Feb-23	Tuesday	
01-Mar-23	Wednesday	
02-Mar-23	Thursday	
03-Mar-23	Friday	
04-Mar-23	Saturday	
05-Mar-23	Sunday	Holiday
06-Mar-23	Monday	
07-Mar-23	Tuesday	
08-Mar-23	Wednesday	Several Competitions (Singing, Dance & Speech) Conducted by Womens Empowerment Cell
09-Mar-23	Thursday	
10-Mar-23	Friday	Short Film Conducted By PHOTOGRAPHY CLUB
11-Mar-23	Saturday	
12-Mar-23	Sunday	Holiday
13-Mar-23	Monday	Commencement of EVEN Semester Classes For PG (ME & MBA I Year & MCA II Year)
14-Mar-23	Tuesday	
15-Mar-23	Wednesday	
16-Mar-23	Thursday	INTERNAL ASSESSMENT – II (UG I Year)
17-Mar-23	Friday	INTERNAL ASSESSMENT – II (UG I Year) / INTERNAL ASSESSMENT – II (PG II Year - M.E)

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DATE	DAY	PARTICULARS
18-Mar-23	Saturday	INTERNAL ASSESSMENT – II (UG I Year) / INTERNAL ASSESSMENT – II (PG II Year - M.E)
19-Mar-23	Sunday	Holiday
20-Mar-23	Monday	INTERNAL ASSESSMENT – II (PG II Year - M.E)
21-Mar-23	Tuesday	INTERNAL ASSESSMENT – II (PG II Year - M.E)
22-Mar-23	Wednesday	Holiday (Ugadi)
23-Mar-23	Thursday	Commencement of EVEN Semester Classes For PG (MCA I Year) / INTERNAL ASSESSMENT – I (UG II Year / III Year & IV Year / MBA II Year IV SEM) / Last Working Day for UG I SEM & PG III SEM/ INTERNAL ASSESSMENT – II (PG II Year - M.E)
24-Mar-23	Friday	INTERNAL ASSESSMENT – I (UG II Year , III Year & IV Year / MBA II Year IV SEM)
25-Mar-23	Saturday	INTERNAL ASSESSMENT – I (UG II Year , III Year & IV Year / MBA II Year IV SEM) / Commencement of Practical Examinations For UG I YEAR & & PG III SEM
26-Mar-23	Sunday	Holiday
27-Mar-23	Monday	
28-Mar-23	Tuesday	
29-Mar-23	Wednesday	
30-Mar-23	Thursday	
31-Mar-23	Friday	
01-Apr-23	Saturday	
02-Apr-23	Sunday	Holiday
03-Apr-23	Monday	
04-Apr-23	Tuesday	Holiday (Mahavir Jayanti)
05-Apr-23	Wednesday	Commencement of Theory Examinations for UG I SEM & PG III SEM
06-Apr-23	Thursday	
07-Apr-23	Friday	Holiday (Good Friday)
08-Apr-23	Saturday	Holiday
09-Apr-23	Sunday	Holiday
10-Apr-23	Monday	
11-Apr-23	Tuesday	
12-Apr-23	Wednesday	

DATE	DAY	PARTICULARS
13-Apr-23	Thursday	MASTER HEALTH CHECK UP Conducted By Faculty Welfare Club
14-Apr-23	Friday	Holiday (Tamil New Year)
15-Apr-23	Saturday	
16-Apr-23	Sunday	Holiday
17-Apr-23	Monday	
18-Apr-23	Tuesday	
19-Apr-23	Wednesday	INTERNAL ASSESSMENT – II (UG III Year & IV Year)
20-Apr-23	Thursday	INTERNAL ASSESSMENT – II (UG III Year & IV Year)
21-Apr-23	Friday	INTERNAL ASSESSMENT – II (UG III Year & IV Year)
22-Apr-23	Saturday	Holiday
23-Apr-23	Sunday	Holiday
24-Apr-23	Monday	
25-Apr-23	Tuesday	FUNDAMENTALS OF INFORMATION LITERARY Conducted By Womens Empowerment Cell
26-Apr-23	Wednesday	
27-Apr-23	Thursday	
28-Apr-23	Friday	
29-Apr-23	Saturday	Holiday
30-Apr-23	Sunday	Holiday
01-May-23	Monday	Holiday
02-May-23	Tuesday	
03-May-23	Wednesday	
04-May-23	Thursday	Fine Arts Club Conducted By CSE Department
05-May-23	Friday	YOGA CLASS Conducted By Faculty Welfare Club for all faculty members
06-May-23	Saturday	
07-May-23	Sunday	Holiday
08-May-23	Monday	

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INSTITUTION ACADEMIC CALENDAR FOR THE EVEN SEMESTER 2022 - 2023

DATE	DAY	PARTICULARS
09-May-23	Tuesday	INTERNAL ASSESSMENT – II (UG II Year/ MBA II Year IV SEM) / INTERNAL ASSESSMENT – III (UG III Year & IV Year)
10-May-23	Wednesday	INTERNAL ASSESSMENT – II (UG II Year/ MBA II Year IV SEM) / INTERNAL ASSESSMENT – III (UG III Year & IV Year) / Commencement of EVEN Semester Classes For UG (I Year II SEM)
11-May-23	Thursday	INTERNAL ASSESSMENT – II (UG II Year/ MBA II Year IV SEM) / INTERNAL ASSESSMENT – III (UG III Year & IV Year)
12-May-23	Friday	Last Working Day for EVEN Semester Classes For UG (II , III Year & IV Year / IV/VI/VIII - SEM)
13-May-23	Saturday	
14-May-23	Sunday	Holiday
15-May-23	Monday	INTERNAL ASSESSMENT – I (PG MCA I Year II SEM) / Commencement of Practical Examinations For UG II, III & IV YEAR
16-May-23	Tuesday	INTERNAL ASSESSMENT – I (PG MCA I Year II SEM) / SHORT FILM EVENT Conducted By Photography Club On behalf of "INTERNATIONAL DAY OF LIGHT"/ Faculty Development Program on STRESS MANAGEMENT Conducted By Faculty Welfare Club
17-May-23	Wednesday	INTERNAL ASSESSMENT – I (PG MCA I Year II SEM)
18-May-23	Thursday	
19-May-23	Friday	
20-May-23	Saturday	
21-May-23	Sunday	Holiday
22-May-23	Monday	
23-May-23	Tuesday	
24-May-23	Wednesday	
25-May-23	Thursday	
26-May-23	Friday	
27-May-23	Saturday	
28-May-23	Sunday	Holiday
29-May-23	Monday	
30-May-23	Tuesday	Seminar on (MICROSOFT OFFICE, OPERATING SYSTEM INSTALLATION & REPAIR) Conducted By Faculty Welfare Club
31-May-23	Wednesday	
01-Jun-23	Thursday	
02-Jun-23	Friday	
03-Jun-23	Saturday	
04-Jun-23	Sunday	Holiday

DATE	DAY	PARTICULARS
05-Jun-23	Monday	
06-Jun-23	Tuesday	
07-Jun-23	Wednesday	
08-Jun-23	Thursday	
09-Jun-23	Friday	
10-Jun-23	Saturday	
11-Jun-23	Sunday	Holiday
12-Jun-23	Monday	
13-Jun-23	Tuesday	
14-Jun-23	Wednesday	
15-Jun-23	Thursday	
16-Jun-23	Friday	
17-Jun-23	Saturday	
18-Jun-23	Sunday	Holiday
19-Jun-23	Monday	
20-Jun-23	Tuesday	
21-Jun-23	Wednesday	
22-Jun-23	Thursday	
23-Jun-23	Friday	
24-Jun-23	Saturday	Holiday
25-Jun-23	Sunday	Holiday
26-Jun-23	Monday	INTERNAL ASSESSMENT – II (PG MCA I Year II SEM) / INTERNAL ASSESSMENT – I (UG I Year II SEM)
27-Jun-23	Tuesday	INTERNAL ASSESSMENT – II (PG MCA I Year II SEM) / INTERNAL ASSESSMENT – I (UG I Year II SEM)
28-Jun-23	Wednesday	INTERNAL ASSESSMENT – II (PG MCA I Year II SEM) / INTERNAL ASSESSMENT – I (UG I Year II SEM)
29-Jun-23	Thursday	Holiday (Bakrid)
30-Jun-23	Friday	INTERNAL ASSESSMENT – I (UG I Year II SEM)

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GOBI (Tk), ERODE (Dt).

Date: 21.07.2022

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON AUTONOMOUS AFFILIATED COLLEGES

August 2022 – December 2022 (ODD SEMESTER – Except Semester III)

UG Programmes

Sl. No.	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	B.E. / B.Tech.(Full-Time)	V, VII	10.08.2022	19.11.2022**	21.11.2022	01.12.2022
2.	B.E. / B.Tech (Part-Time)	V, VII				
3.	B.Arch. (Full-Time)	V, VII, IX				

RE - OPENING DAY FOR THE NEXT SEMESTER: 26.12.2022 (Monday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

** In order to ensure minimum no. of working days, the following Saturdays are declared as working days.

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1.	20.08.2022	Monday
2.	03.09.2022	Friday
3.	17.09.2022	Wednesday
4.	15.10.2022	Tuesday

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
5.	29.10.2022	Wednesday
6.	05.11.2022	Monday
7.	12.11.2022	Tuesday
8.	19.11.2022	Wednesday

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

21.07.2022

DIRECTOR
ACADEMIC COURSES

DAC - SB

REVISED

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON AUTONOMOUS AFFILIATED COLLEGES

August 2022 – December 2022 (ODD SEMESTER – Except Semester III)

UG Programmes

Sl. No	Programme	Semester	Commencement of Classes	Last working day		Commencement of Practical Examinations		Commencement of End Semester Examinations	
				Existing	Revised	Existing	Revised	Existing	Revised
1.	B.E. / B.Tech.(Full-Time)	V, VII	10.08.2022	19.11.2022	06.12.2022**	21.11.2022	08.12.2022	01.12.2022	15.12.2022
2.	B.E. / B.Tech (Part-Time)	V, VII		19.11.2022	-	21.11.2022	-	01.12.2022	-
3.	B.Arch. (Full-Time)	V, VII, IX							

RE - OPENING DAY FOR THE NEXT SEMESTER: 09.01.2023 (Monday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

** In order to ensure minimum no. of working days, the following Saturdays are declared as working days.

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1.	20.08.2022	Monday
2.	03.09.2022	Friday
3.	17.09.2022	Wednesday
4.	15.10.2022	Tuesday
5.	29.10.2022	Wednesday

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
5.	05.11.2022	Monday
6.	12.11.2022	Tuesday
7.	19.11.2022	Wednesday
8.	26.11.2022**	Thursday
9.	03.12.2022**	Friday

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

DIRECTOR (CAC)

DAC - SB

Date: 02.11.2022

REVISED

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

August 2022 – December 2022 (ODD SEMESTER – Except Semester III)

UG Programmes

Sl. No	Programme	Semester	Commencement of Classes	Last working day		Commencement of Practical Examinations		Commencement of End Semester Examinations	
				Existing	Revised	Existing	Revised	Existing	Revised
1.	B.E. / B.Tech.(Full-Time)	V, VII	10.08.2022	19.11.2022	06.12.2022**	21.11.2022	18.01.2023	01.12.2022	08.12.2022
2.	B.E. / B.Tech (Part-Time)	V, VII	10.08.2022	19.11.2022	-	21.11.2022	-	01.12.2022	-
3.	B.Arch. (Full-Time)	V, VII, IX							

RE - OPENING DAY FOR THE NEXT SEMESTER: 30.01.2023 (Monday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

** In order to ensure minimum no. of working days, the following Saturdays are declared as working days.

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1.	20.08.2022	Monday
2.	03.09.2022	Friday
3.	17.09.2022	Wednesday
4.	15.10.2022	Tuesday
5.	29.10.2022	Wednesday

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
6.	05.11.2022	Monday
7.	12.11.2022	Tuesday
8.	19.11.2022	Wednesday
9.	26.11.2022**	Thursday
10.	03.12.2022**	Friday

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

02/11/2022

DIRECTOR
ACADEMIC COURSES

DAC - SB

Date: 17.08.2022

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

August 2022 – December 2022 (Semester III)

UG (FT/PT) & PG (FT/PT) Degree Programmes

Sl. No.	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	B.E. / B.Tech.(Full-Time)	III	22.08.2022	08.12.2022	10.12.2022	21.12.2022
2.	B.Arch. (Full-Time)	III				
3.	B.E. / B.Tech (Part-Time)	III				
4.	M.B.A. (Full-Time & Part-Time)	III				
5.	M.B.A. (5 Yrs-Integrated)	III				

RE - OPENING DAY FOR THE NEXT SEMESTER: 23.01.2023 (Monday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

17/8/2022

DIRECTOR
ACADEMIC COURSES

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

DAC - SB -

Date: 22.08.2022

REVISED

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

August 2022 – December 2022 (Semester III)

UG (FT/PT) & PG (FT/PT) Degree Programmes

Sl. No.	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	B.E. / B.Tech.(Full-Time)	III	22.08.2022	08.12.2022	10.12.2022	21.12.2022
2.	B.Arch. (Full-Time)	III				
3.	B.E. / B.Tech (Part-Time)	III				
4.	M.B.A. (5 Yrs-Integrated)	III				
5.	M.B.A. (Full-Time & Part-Time)	III	01.09.2022	19.12.2022	21.12.2022	02.01.2023

RE - OPENING DAY FOR THE NEXT SEMESTER: 30.01.2023 (Monday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

22/08/2022

DIRECTOR
ACADEMIC COURSES

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

DAC - SB

Date: 02.11.2022

REVISED - I

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

August 2022 – December 2022 (Semester III)

UG (FT/PT) & PG (FT/PT) Degree Programmes

Sl. No.	Programme	Semester	Commencement of Classes	Last working day		Commencement of Practical Examinations		Commencement of End Semester Examinations	
				Existing	Revised	Existing	Revised	Existing	Revised
1.	B.E. / B.Tech. (Full-Time)	III	22.08.2022	08.12.2022	27.12.2022	10.12.2022	18.01.2023	21.12.2022	29.12.2022
2.	B.Arch. (Full-Time)	III	22.08.2022	08.12.2022	-	10.12.2022	18.01.2023	21.12.2022	29.12.2022
3.	B.E. / B.Tech (Part-Time)	III							
4.	M.B.A. (5 Yrs-Integrated)	III							
5.	M.B.A. (Full-Time & Part-Time)	III	01.09.2022	19.12.2022	-	21.12.2022	18.01.2023	02.01.2023	29.12.2022

RE - OPENING DAY FOR THE NEXT SEMESTER: 01.02.2023 (Wednesday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
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GOBI (Tk), ERODE (Dt).

02/11/2022

DIRECTOR
ACADEMIC COURSES

DAC - SB

ANNA UNIVERSITY:: CHENNAI 600 025

Internal Assessment Schedule for Non Autonomous Affiliated Institutions

AUGUST 2022 – DECEMBER 2022 - (SEMESTER - III)

UG (FT&PT) & PG(M.B.A) (5yrs integrated) Degree Programmes

Report No	Report Period	Test Period	Report Entry Period
I	22-08-2022 – 15-10-2022	10-10-2022 – 15-10-2022	15-10-2022 – 21-10-2022
II	17-10-2022 -- 08-12-2022	02-12-2022 -- 08-12-2022	08-12-2022 – 10-12-2022

Saturdays may be included as working days to make good the Shortages, if any.

P. Santhiveel
19.09.2022

CONTROLLER OF EXAMINATIONS

19.09.22

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY:: CHENNAI 600 025

Internal Assessment Schedule for Non Autonomous Affiliated Institutions

AUGUST2022 - DECEMBER 2022 - For all UG - Programmes (ODD SEMESTER-EXCEPT III SEMESTER)

Report No	Report Period	Test Period	Report Entry Period
I	10-08-2022 –23-08-2022	----	29-09-2022 – 06-10-2022
II	24-08-2022 -- 21-09-2022	16-09-2022 -- 21-09-2022	29-09-2022 -- 06-10-2022
III	22-09-2022 -- 21-10-2022	17-10-2022 -- 21-10-2022	21-10-2022 --29-10-2022
IV	22-10-2022 -- 19-11-2022	14-11-2022 -- 19-11-2022	19-11-2022 -- 21-11-2022

Saturdays may be included as working days to make good the Shortages, if any.

19.09.2022

CONTROLLER OF EXAMINATIONS

19-09-22

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Date: 20.09.2022

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

September 2022 – February 2023 (ODD SEMESTER –Semester III)

M.C.A. (FT) Degree Programme

Sl. No	Programme	Semester	Commencement of Regular MCA Classes (Students undergoing Bridge Courses)		Continuation of Classes (for both Regular and Students undergoing Bridge Courses)	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
			From	To				
1.	M.C.A (FT)	III	28.09.2022	18.10.2022	19.10.2022	04.02.2023	06.02.2023	13.02.2023

RE-OPENING DAY FOR THE NEXT SEMESTER: 08.03.2023 (Wednesday)

1. Theory and Practical Examination schedules will be published in due course. (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

20/9/2022
DIRECTOR
ACADEMIC COURSES

DAC - SB

Date: 27.09.2022

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

September 2022 – February 2023 (ODD SEMESTER –Semester I)

M.C.A. (FT) Degree Programme

Sl. No	Programme	Semester	Commencement of Regular MCA Classes (Students undergoing Bridge Courses)		Continuation of Classes (for both Regular and Students undergoing Bridge Courses)	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
			From	To				
1.	M.C.A (FT)	I	28.09.2022	18.10.2022	19.10.2022	04.02.2023	06.02.2023	13.02.2023

RE-OPENING DAY FOR THE NEXT SEMESTER: 13.03.2023 (Monday)

1. Theory and Practical Examination schedules will be published in due course. (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI.(Tk), ERODE (Dt).

27.9.2022

DIRECTOR
ACADEMIC COURSES

DAC - SB

ANNA UNIVERSITY:: CHENNAI 600 025

Internal Assessment Schedule for Non Autonomous Affiliated Institutions

SEPTEMBER 2022 – DECEMBER 2022 - (SEMESTER - III)

PG (FT&PT) Degree Programmes - M.B.A.

Report No	Report Period	Test Period	Report Entry Period
I	01-09-2022 – 26-10-2022	19-10-2022 – 26-10-2022	26-10-2022 – 01-11-2022
II	27-10-2022 -- 19-12-2022	13-12-2022 – 19-12-2022	19-12-2022 -- 21-12-2022

Saturdays may be included as working days to make good the Shortages, if any.

19.09.2022

CONTROLLER OF EXAMINATIONS

19-09-22

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Date: 06.10.2022

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

October 2022 – February 2023 (SEMESTER I)

PG (FT/PT) Degree Programmes

Sl. No	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	M.B.A. (Full-Time & Part-Time)	I	10.10.2022	25.01.2023	27.01.2023	06.02.2023
2.	M.B.A. (5 Yrs-Integrated)					

RE-OPENING DAY FOR THE NEXT SEMESTER: 08.03.2023 (Wednesday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course. (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

DIRECTOR i/c
ACADEMIC COURSES

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

DAC - SB

Date: 06.10.2022

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

October 2022 – February 2023 (Odd Semester – Semester I)

PG (FT) Degree Programmes

Sl. No	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	M.E. / M. Tech. / M. Arch.(FT)	I	10.10.2022	25.01.2023	27.01.2023	06.02.2023

RE-OPENING DAY FOR THE NEXT SEMESTER: 08.03.2023 (Wednesday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course. (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk). ERODE (Dt).

DIRECTOR i/c
ACADEMIC COURSES

DAC - SB

ANNA UNIVERSITY:: CHENNAI 600 025

Internal Assessment Schedule for Non Autonomous Affiliated Institutions

OCTOBER 2022 – JANUARY 2023 - (SEMESTER – I)

PG (FT&PT) Degree Programmes - M.B.A&M.BA(INTEGRATED)

Report No	Report Period	Test Period	Report Entry Period
I	10-10-2022 – 02-12-2022	28-11-2022 – 02-12-2022	19-12-2022 – 23-12-2022
II	03-12-2022 -- 25-01-2023	20-01-2023 -- 25-01-2023	25-01-2023 -- 27-01-2023

Saturdays may be included as working days to make good the Shortages, if any.

19-12-2022

CONTROLLER OF EXAMINATIONS

19-12-2022.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY:: CHENNAI 600 025

Internal Assessment Schedule for Non Autonomous Affiliated Institutions

OCTOBER 2022 – JANUARY 2023 - (SEMESTER – I)

PG (FT) Degree Programmes - M.E. / M.Tech. / M.Arch.

Report No	Report Period	Test Period	Report Entry Period
I	10-10-2022 – 02-12-2022	28-11-2022 – 02-12-2022	19-12-2022 – 23-12-2022
II	03-12-2022 – 25-01-2023	20-01-2023 – 25-01-2023	25-01-2023 – 27-01-2023

Saturdays may be included as working days to make good the Shortages, if any.

P. Sankaralingam 16-12-2022

CONTROLLER OF EXAMINATIONS

16/12/2022 16-12-2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY:: CHENNAI 600 025

Internal Assessment Schedule for Non Autonomous Affiliated Institutions

OCTOBER 2022 – FEBRUARY 2023 - (SEMESTER – III)

PG (FT) Degree Programmes - M.C.A.

Report No	Report Period	Test Period	Report Entry Period
I	19-10-2022 – 10-12-2022	05-12-2022 – 10-12-2022	19-12-2022 – 23-12-2022
II	12-12-2022 -- 04-02-2023	30-01-2023 -- 04-02-2023	04-02-2023 -- 06-02-2023

Saturdays may be included as working days to make good the Shortages, if any.

16.12.2022

CONTROLLER OF EXAMINATIONS

16/12/2022

16-12-2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
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T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY:: CHENNAI 600 025

Internal Assessment Schedule for Non Autonomous Affiliated Institutions

OCTOBER 2022 – FEBRUARY 2023 - (SEMESTER – I)

PG (FT) Degree Programmes - M.C.A.

Report No	Report Period	Test Period	Report Entry Period
I	19-10-2022 – 10-12-2022	05-12-2022 – 10-12-2022	19-12-2022 – 23-12-2022
II	12-12-2022 -- 04-02-2023	30-01-2023 -- 04-02-2023	04-02-2023 -- 06-02-2023

Saturdays may be included as working days to make good the Shortages, if any.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
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T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

19-12-2022

CONTROLLER OF EXAMINATIONS

Date: 02.11.2022

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

November 2022 – April 2023 (SEMESTER I)

UG (FT/PT) Degree Programmes

Sl. No.	Programme	Semester	Commencement of Induction Programme	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	B.E. / B.Tech. (Full Time)	I	14.11.2022	28.11.2022	23.03.2023	25.03.2023	05.04.2023
2.	B.Arch.(Full Time)	I	14.11.2022	28.11.2022	15.03.2023	25.03.2023	05.04.2023
3.	B.E. / B.Tech. (Part Time)	I	-	14.11.2022	01.03.2023	25.03.2023	05.04.2023

RE-OPENING DAY FOR THE NEXT SEMESTER: 15.05.2023 (Monday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course. (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

02/11/2022

DIRECTOR
ACADEMIC COURSES

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

DAC - SB

ANNA UNIVERSITY:: CHENNAI 600 025

Internal Assessment Schedule for Non Autonomous Affiliated Institutions

NOVEMBER 2022 – MARCH 2023 - (SEMESTER – I)

UG (FT) Degree Programmes

Report No	Report Period	Test Period	Report Entry Period
I	28-11-2022 – 24-01-2023	18-01-2023 – 24-01-2023	25-01-2023 – 03-02-2023
II	25-01-2023 -- 23-03-2023	16-03-2023 -- 23-03-2023	23-03-2023 -- 25-03-2023

Saturdays may be included as working days to make good the Shortages, if any.

06.01.2023

CONTROLLER OF EXAMINATIONS

06-01-2023

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Date: 02.11.2022

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

December 2022 – April 2023 (Odd Semester –Semester III)

PG (FT) Degree Programmes

Sl. No	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	M.E. / M. Tech. / M. Arch.(FT)	III	12.12.2022	23.03.2023	25.03.2023	05.04.2023

RE-OPENING DAY FOR THE NEXT SEMESTER: 15.05.2023 (Monday)

** In order to ensure minimum no. of working days, the following Saturdays are declared as working days.

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1.	24.12.2022	Monday
2.	07.01.2023	Tuesday
3.	21.01.2023	Wednesday

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
4.	04.02.2023	Wednesday
5.	18.02.2023	Friday

1. Theory and Practical Examination schedules will be published in due course. (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

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GOBI (Tk), ERODE (Dt).

02/11/2022

DIRECTOR
ACADEMIC COURSES

DAC - SB

ANNA UNIVERSITY:: CHENNAI 600 025

Internal Assessment Schedule for Non Autonomous Affiliated Institutions

DECEMBER 2022 – MARCH 2023 - (SEMESTER – III)

PG (FT) Degree Programmes - M.E. / M.Tech. / M.Arch.

Report No	Report Period	Test Period	Report Entry Period
I	12-12-2022 – 01-02-2023	27-01-2023 – 01-02-2023	01-02-2023 – 07-02-2023
II	02-02-2023 -- 23-03-2023	17-03-2023 -- 23-03-2023	23-03-2023 -- 25-03-2023

Saturdays may be included as working days to make good the Shortages, if any.

P. Saravanan 29.12.2022

CONTROLLER OF EXAMINATIONS

29-12-2022

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ANNA UNIVERSITY:: CHENNAI – 600 025

REVISED NOTIFICATION

NOVEMBER/DECEMBER 2022 EXAMINATIONS

It is informed that the November/December 2022 Practical Examinations for B.E./B.Tech./B.Arch./M.Sc.(5Yrs.)/M.B.A./M.B.A.(5Yrs.)/M.C.A./M.E./M.Tech./M.Arch. Programmes are scheduled to be held as detailed below:-

B.E/B.Tech./B.Arch./B.E (Part time R2014)./ M.E/M.Tech./M.Arch./M.B.A/M.C.A programmes (Except R-2021)

Last working day for B.E./B.Tech.		: 06.12.2022
Last working day for B.Arch. & B.E./B.Tech. Part time only		: 19.11.2022
Commencement of Theory Examinations		: 08.12.2022
Practical Examinations	Slot – I	: 21.01.2023 to 25.01.2023
	Slot – II	: 27.01.2023 to 31.01.2023

B.E/B.Tech./B.Arch. (I to III Semester) programmes (R-2021) & B.E Part time III semester only

Last working day for B.E./B.Tech.		: 27.12.2022
Last working day for B.Arch. & B.E./B.Tech. Part time only		: 08.12.2022
Commencement of Theory Examinations		: 29.12.2022
Practical Examinations	Slot – I	: 21.01.2023 to 25.01.2023
	Slot – II	: 27.01.2023 to 31.01.2023

P. Sakthivel 15.12.2022

(Dr. P. SAKTHIVEL)
CONTROLLER OF EXAMINATIONS i/c

Chennai: 600 025
Dated : 15.12.2022

15.12.22

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ANNA UNIVERSITY:: CHENNAI – 600 025

NOTIFICATION

NOVEMBER/DECEMBER 2022 EXAMINATIONS

It is informed that the November/December 2022 Practical Examinations for M.B.A/M.E/M.Tech./M.Arch./M.C.A. Programmes are scheduled to be held as detailed below:-

M.B.A/M.E/M.Tech./M.Arch. programmes (R-2021)

Last working day for M.B.A, M.E/M.Tech./M.Arch [I[st] Semester]		: 25.01.2023
Commencement of Theory Examinations [I[st] Semester]		: 06.02.2023
Practical Examinations [For M.B.A – I to III Semester] [For M.E./M.Tech./M.Arch – I Semester only]	Slot – I	: 27.01.2023 to 30.01.2023
	Slot – II	: 31.01.2023 to 03.02.2023

M.CA programmes (R-2021)

Last working day for M.C.A [I & III Semester]		: 04.02.2023
Commencement of Theory Examinations	I Semester	: 13.02.2023
	III Semester	: 14.02.2023
Practical Examinations [I to III Semester]	Slot – I	: 06.02.2023 to 08.02.2023
	Slot – II	: 09.02.2023 to 11.02.2023

P. Sakthivel 25.01.2023

(Dr. P. SAKTHIVEL)
CONTROLLER OF EXAMINATIONS i/c

Chennai: 600 025
Dated : 25.01.2023

25-1-23

PRINCIPAL
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T.N. - 638 506.
(Dt).

Date: 28.01.2023

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

February 2023 – May 2023 (Even Semester – Except Semester II)

UG / PG (FT/PT) Degree Programmes

Sl. No.	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	B.E. / B.Tech.(Full-Time)	IV,VI,VIII	06.02.2023	12.05.2023**	15.05.2023	26.05.2023
2.	B.Arch. (Full-Time)	IV,VI,VIII,X				
3.	B.E. / B.Tech. (Part-Time)	IV,VI				
4.	M.B.A. (Full-Time & Part-Time)	IV				
5.	M.B.A. (5 Yrs-Integrated)	IV,VI,VIII,X				

RE - OPENING DAY FOR THE NEXT SEMESTER: 31.07.2023 (Monday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

** In order to ensure minimum no. of working days, the following Saturdays are declared as working days.

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1.	11.02.2023	Monday
2.	18.02.2023	Tuesday
3.	25.02.2023	Wednesday
4.	04.03.2023	Thursday
5.	11.03.2023	Friday

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
6.	18.03.2023	Monday
7.	25.03.2023	Tuesday
8.	01.04.2023	Wednesday
9.	29.04.2023	Thursday
10.	06.05.2023	Friday

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28.01.2023

DIRECTOR
ACADEMIC COURSES

DAC - SB

Date: 27.02.2023

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

March 2023 – July 2023 (Even Semester – Semester II)

M.C.A. (FT) Degree Programme

Sl. No	Programme	Semester	Commencement of Regular MCA Classes (Students undergoing Bridge Courses)		Continuation of Classes (for both Regular and Students undergoing Bridge Courses)	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
			From	To				
1.	M.C.A (FT)	II	06.03.2023	21.03.2023	23.03.2023	04.07.2023	06.07.2023	17.07.2023

RE-OPENING DAY FOR THE NEXT SEMESTER: 21.08.2023 (Monday)

1. Theory and Practical Examination schedules will be published in due course. (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

** In order to ensure minimum no. of working days, the following Saturdays are declared as working days.

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1.	11.03.2023	Monday
2.	18.03.2023	Tuesday
3.	01.04.2023	Wednesday
4.	29.04.2023	Thursday

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
5.	13.05.2023	Friday
6.	27.05.2023	Monday
7.	10.06.2023	Tuesday
8.	24.06.2023	Wednesday

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27/2/2023

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OFFICE OF THE CONTROLLER OF EXAMINATION

MARCH 2023 – JULY 2023 - (SEMESTER - II) – R-2021

FOR MCA PROGRAMMES

Report No	Report Period	Test Period	Report Entry Period
I	23-03-2023 – 16-05-2023	11-05-2023 – 16-05-2023	16-05-2023 – 22-05-2023
II	17-05-2023 – 04-07-2023	27-06-2023 – 04-07-2023	04-07-2023 – 05-07-2023

Saturdays may be included as working days to make good the Shortages, if any.

02-05-2023

CONTROLLER OF EXAMINATIONS

02/05/2023 02.05.23.

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OFFICE OF THE CONTROLLER OF EXAMINATION

MARCH 2023 – JULY 2023 - (SEMESTER – II & IV) – R-2021

FOR ALL PG (MBA(FT&PT) & Integrated)/ M.ARCH/ MCA PROGRAMMES

Report No	Report Period	Test Period	Report Entry Period
I	13-03-2023 – 10-05-2023	04-05-2023 – 10-05-2023	10-05-2023 – 18-05-2023
II	11-05-2023 – 03-07-2023	26-06-2023 – 03-07-2023	03-07-2023 – 05-07-2023

Saturdays may be included as working days to make good the Shortages, if any.

P. Gunasekaran 02.05.2023

CONTROLLER OF EXAMINATIONS

02/05/2023

02.05.23.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
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T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Date: 27.02.2023

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

March 2023 – July 2023 (Even Semester)

PG (FT) Degree Programmes

Sl. No	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	M.E. / M. Tech. / M. Arch.(FT)	II	13.03.2023	03.07.2023	06.07.2023	17.07.2023
2.	M.B.A. (Full-Time & Part-Time)	II				
3.	M.B.A. (5 years Integrated)	II				
4.	M.C.A.	IV				

RE-OPENING DAY FOR THE NEXT SEMESTER: 20.09.2023 (Wednesday)

1. Theory and Practical Examination schedules will be published in due course. (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

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27/2/2023
DIRECTOR
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DAC - SB

Date: 30.03.2023

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

REVISED

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

February 2023 – June 2023 (Even Semester – Except Semester II)

UG / PG (FT/PT) Degree Programmes

Sl. No.	Programme	Semester	Commencement of Classes	Last working day		Commencement of Practical Examinations		Commencement of End Semester Examinations	
				Existing	Revised	Existing	Revised*	Existing	Revised*
1.	B.E. / B.Tech.(Full-Time)	IV,VI	06.02.2023	12.05.2023	24.05.2023***	15.05.2023	26.05.2023	26.05.2023	05.06.2023
2.	B.E. / B.Tech.(Full-Time)	VIII	06.02.2023	12.05.2023**	-	15.05.2023	-	26.05.2023	-
3.	B.Arch. (Full-Time)	IV,VI,VIII,X							
4.	B.E. / B.Tech. (Part-Time)	IV,VI							
5.	M.B.A.(Full-Time & Part-Time)	IV							
6.	M.B.A. (5 Yrs-Integrated)	IV,VI,VIII,X							

RE - OPENING DAY FOR THE NEXT SEMESTER: 07.08.2023 (Monday)

* To provide additional classes for Skill Based Courses.

NOTE:

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

** In order to ensure minimum no. of working days, the following Saturdays are declared as working days.

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1.	11.02.2023	Monday
2.	18.02.2023	Tuesday
3.	25.02.2023	Wednesday
4.	04.03.2023	Thursday
5.	11.03.2023	Friday
6.	18.03.2023	Monday

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
7.	25.03.2023	Tuesday
8.	01.04.2023	Wednesday
9.	29.04.2023	Thursday
10.	06.05.2023	Friday
11.	13.05.2023	Monday***
12.	20.05.2023	Tuesday***

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30/3/2023

DIRECTOR
ACADEMIC COURSES

DAC - SB

Date: 04.05.2023

CENTRE FOR ACADEMIC COURSES

ANNA UNIVERSITY: : CHENNAI – 600 025

ACADEMIC SCHEDULE FOR NON-AUTONOMOUS AFFILIATED COLLEGES

May 2023 – August 2023 (Even Semester)

UG (FT/PT) & PG (FT) Degree Programmes

Sl. No.	Programme	Semester	Commencement of Classes	Last working day	Commencement of Practical Examinations	Commencement of End Semester Examinations
1.	B.E. / B.Tech.(Full-Time)	II	10.05.2023	07.08.2023**	09.08.2023	21.08.2023
2.	B.Arch. (Full-Time)	II				
3.	B.E. / B.Tech (Part-Time)	II				
4.	M.E. / M. Tech. / M. Arch. (FT)	IV				

RE - OPENING DAY FOR THE NEXT SEMESTER: 11.09.2023 (Monday)

NOTE:

1. The Theory and Practical Examination schedules will be published in due course (Practical Examinations will be conducted before the theory examinations).
2. If necessary, loss of classes due to various curricular / co-curricular activities of the department / college may be compensated by conducting classes on Saturdays.

**** In order to ensure minimum no. of working days, the following Saturdays are declared as working days.**

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
1.	13.05.2023	Friday
2.	20.05.2023	Monday
3.	27.05.2023	Tuesday
4.	03.06.2023	Wednesday
5.	10.06.2023	Thursday
6.	17.06.2023	Friday

Sl. No.	Working Days (Saturdays)	Time Table of the Week Day to be Followed
7.	24.06.2023	Monday
8.	01.07.2023	Tuesday
9.	08.07.2023	Wednesday
10.	15.07.2023	Thursday
11.	22.07.2023	Friday
12.	05.08.2023	Monday

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04/05/2023
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ANNA UNIVERSITY:: CHENNAI 600 025

OFFICE OF THE CONTROLLER OF EXAMINATION

May 2023 – August 2023 - (SEMESTER - II & IV) – R-2021

FOR ALL UG (B.E/B.TECH/B.ARCH (NON STUDIO) / PG PROGRAMMES

Report No	Report Period	Test Period	Report Entry Period
I	10-05-2023 – 22-06-2023	26-06-2023 – 30-06-2023	03-07-2023 – 07-07-2023
II	23-06-2023 – 07-08-2023	01-08-2023 – 07-08-2023	07-08-2023 – 08-08-2023

Saturdays may be included as working days to make good the Shortages, if any.

20.06.2023

CONTROLLER OF EXAMINATIONS

30/06/2023

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ANNA UNIVERSITY:: CHENNAI – 600 025

NOTIFICATION

APRIL/MAY 2023 EXAMINATIONS

It is informed that the April/May 2023 Practical and Project Viva Voce Examinations M.B.A./M.B.A.(5Yrs.)/M.C.A./M.E./M.Tech./M.Arch. Programmes are scheduled to be held as detailed below:-

M.B.A./M.B.A.(5Yrs.)./M.E./M.Tech./M.Arch. – II Semester and M.C.A, IV Semester Programmes (R2021) Examinations

Last working day for M.C.A II Sem		:	04.07.2023
Last working day for (M.E./M.Tech./M.Arch./M.B.A/ M.B.A 5 Yrs)- (II Semesters) /M.C.A (IV) Semester		:	03.07.2023
Commencement of Theory Examinations		:	17.07.2023
Practical Examinations	Slot I	:	06.07.2023 to 08.07.2023
	Slot II	:	10.07.2023 to 12.07.2023
Last date for Project work Submission M.C.A (IV) Semester		:	02.09.2023
Project Viva Voce Examinations M.C.A		:	04.09.2023

M.E./M.Tech. Programmes Part-Time R2017 Examinations VI Semester

Practical Examinations	Slot I	:	06.07.2023 to 08.07.2023
	Slot II	:	10.07.2023 to 12.07.2023
Last date for Project work Submission		:	02.09.2023
Project Viva Voce Examinations		:	04.09.2023

P. Sakthivel 30.06.2023

(Dr. P. SAKTHIVEL)
CONTROLLER OF EXAMINATIONS i/c

Chennai: 600 025
Dated : 30.6.2023

30.6.23

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GOBI (TK), ERODE (Dt).

COURSE FILE

SUBJECT CODE	:	**CS3391**
SUBJECT TITLE	:	**OBJECT ORIENTED PROGRAMMING**
DEPARTMENT	:	**INFORMATION TECHNOLOGY**
CLASS	:	**II-IT**
SEMESTER	:	**III**
HANDLED BY	:	**P.SANGEETHA M.E., AP/IT**

DEPARTMENT OF INFORMATION TECHNOLOGY

J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY.

CONTENTS

1. **INDIVIDUAL TIME TABLE**
2. **SYLLABUS**
3. **LESSON PLAN**
4. **I-V UNITS NOTES**
5. **QUESTION PAPERS**
6. **INTERNAL ASSESSMENT MARKLIST**
7. **UNIVERSITY QUESTION BANK**

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY T.N. PALAYAM, GOBI-638506

DEPARTMENT OF INFORMATION TECHNOLOGY

NAME OF THE STAFF : Mrs.SANGEETHA. P

III-SEMESTER/IT

TIME	9.30-10.15	10.15-11.00	11.00-11.10	11.10-11.55	11.55-12.40	12.40-01.25	01.25-2.05	2.05-2.45	2.24-2.55	2.55-3.35	3.35-4.15
DAY/HR	1	2		3	4		5	6		7	8
MON			BREAK		OOP	LUNCH			BREAK		
TUE	OOP										OOP
WED					OOP						
THU											
FRI											OOP

THEORY	OBJECT ORIENTED PROGRAMMING	5 hrs
Total		5 hrs

CS3391 OBJECT ORIENTED PROGRAMMING L T P C

3 0 0 3

COURSE OBJECTIVES:

- To understand Object Oriented Programming concepts and basics of Java programminglanguage
- To know the principles of packages, inheritance and interfaces
- To develop a java application with threads and generics classes
- To define exceptions and use I/O streams
- To design and build Graphical User Interface Application using JAVAFX

UNIT I INTRODUCTION TO OOP AND JAVA 9

Overview of OOP – Object oriented programming paradigms – Features of Object Oriented Programming – Java Buzzwords – Overview of Java – Data Types, Variables and Arrays – Operators – Control Statements – Programming Structures in Java – Defining classes in Java – Constructors-Methods -Access specifiers - Static members- JavaDoc comments

UNIT II INHERITANCE, PACKAGES AND INTERFACES 9

Overloading Methods – Objects as Parameters – Returning Objects –Static, Nested and Inner Classes. Inheritance: Basics– Types of Inheritance -Super keyword - Mcthod Overriding – Dynamic Method Dispatch –Abstract Classcs – final with Inheritance. Packages and Interfaces: Packages – Packages and Member Access –Importing Packages – Interfaces.

UNIT III EXCEPTION HANDLING AND MULTITHREADING 9

Exception Handling basics – Multiple catch Clauses – Nested try Statements – Java's Built-in Exceptions – User defined Exception. Multithreaded Programming: Java Thread Model–Creating a Thread and Multiple Threads – Priorities – Synchronization – Inter Thread Communication- Suspending –Resuming, and Stopping Threads –Multithreading. Wrappers – Auto boxing.

UNIT IV I/O, GENERICS, STRING HANDLING 9

I/O Basics – Reading and Writing Console I/O – Reading and Writing Files. Generics: Generic Programming – Generic classes – Generic Methods – Bounded Types – Restrictions and Limitations. Strings: Basic String class, methods and String Buffer Class..

UNIT V JAVAFX EVENT HANDLING, CONTROLS AND COMPONENTS 9

JAVAFX Events and Controls: Event Basics – Handling Key and Mouse Events. Controls: Checkbox, ToggleButton – RadioButtons – ListView – ComboBox – ChoiceBox – Text Controls – ScrollPane. Layouts – FlowPane – HBox and VBox – BorderPane – StackPane – GridPane. Menus

– Basics – Menu – Menu bars – MenuItem.

COURSE OUTCOMES:

On completion of this course, the students will be able to

CO1: Apply the concepts of classes and objects to solve simple problems

CO2: Develop programs using inheritance, packages and interfaces

CO3: Make use of exception handling mechanisms and multithreaded model to solve real worldproblems

CO4: Build Java applications with I/O packages, string classes, Collections and generics concepts **CO5:**Integrate the concepts of event handling and JavaFX components and controls for developingGUI based applications

TOTAL:45PERIOS

TEXT BOOKS:

1. Herbert Schildt, "Java: The Complete Reference", 11 th Edition, McGraw Hill Education, NewDelhi, 2019
2. Herbert Schildt, "Introducing JavaFX 8 Programming", 1 st Edition, McGraw Hill Education, NewDelhi, 2015

REFERENCE:

1. Cay S. Horstmann, "Core Java Fundamentals", Volume 1, 11 th Edition, Prentice Hall, 2018.

J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY

Approved by AICTE, New Delhi And Affiliated to Anna University, Chennai.

T.N.Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

B.TECH IT STUDENT NAMELIST

II YEAR/ III SEM

S.NO	REGISTER NO	NAME OF THE STUDENT
1	731221205003	BHUVANESWARAN M
2	731221205004	BOOPATHI C
3	731221205005	DEVIKA A
4	731221205006	DHANALAKSHMI C
5	731221205007	DHARSHINI P
6	731221205008	DHAYALAN R
7	731221205009	DINESH M
8	731221205010	DIVYA S
9	731221205011	KARTHICKRAJA G
10	731221205012	KAVIBHARATHI G
11	731221205013	KOWSALYA G
12	731221205015	KRISHNAN S
13	731221205016	MADHANKUMAR N
14	731221205017	MAHADEVAMMA S
15	731221205019	MANIGANDAN M
16	731221205020	MANILA K
17	731221205021	MANOJKUMAR S
18	731221205022	MAVURIYA D
19	731221205023	MEGALATHANGAMANI M

20	731221205026	MOTHIR L
21	731221205027	MOUNASAKTHI G
22	731221205028	NANDHINI S
23	731221205029	NAVEEN S
24	731221205030	PANDEESWARAN C K
25	731221205031	PARTHIBAN M
26	731221205032	RAKSHITHA B
27	731221205033	RATHNA R
28	731221205034	RAVIKUMAR M
29	731221205035	RITHIK S
30	731221205036	ROHITH V
31	731221205037	SHARANKUMAR M V
32	731221205038	SIDDAPPA S
33	731221205039	SUNDHARESWARI V
34	731221205040	SUYAMBURAJ C
35	731221205041	SWETHA S
36	731221205042	TAMILSELVAN M
37	731221205044	YUSWANTHRAA R
38	731221205301	AHALYA J C

FACULTY INCHARGE **HOD**

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY, T.N.PALAYAM

DEPARTMENT OF INFORMATION TECHNOLOGY

LESSON PLAN

FACULTY NAME : **P.SANGEETHA**
DESIGNATION : **AP/IT**
SUBJECT CODE / TITLE : **CS3391/ OBJECT ORIENTED PROGRAMMING**
BRANCH/SEMEMSTER : **IT/III**
YEAR : **II**

OBJECTIVES:

- To understand Object Oriented Programming concepts and basics of Java programming language.
- To know the principles of packages, inheritance and interfaces.
- To develop a java application with threads and generics classes.
- To define exceptions and use I/O streams.
- To design and build Graphical User Interface Application using JAVAFX.

HOURS	TOPICS TO BE COVERED	DATE	PERIOD	TEACHING METHODOLOGY	TEACHING AID	REMARKS
UNIT I INTRODUCTION TO OOP AND JAVA						
1	Overview of OOP & Object oriented programming paradigms	22/8/22 23/8/22	4 1.8	LECTURE	BOARD & CHALK	
2	Features of Object Oriented Programming & Java Buzzwords	24/8/22	4	LECTURE	BOARD & CHALK	
3	Overview of Java & Data Types, Variables and Array	27/8/22	8	LECTURE	BOARD & CHALK	

4	Operators	2/9/22	8	LECTURE	BOARD & CHALK	
5	Control Statements	3/9/22	4	LECTURE	BOARD & CHALK	
6	Programming Structures in Java & Defining classes in Java	5/9/22	4	LECTURE	BOARD & CHALK	
7	Constructors & Methods	7/9/22	4	LECTURE	BOARD & CHALK	
8	Access specifiers & Static members	9/9/22	8	LECTURE	BOARD & CHALK	
9	JavaDoc comments	16/9/22	1, 8	LECTURE	BOARD & CHALK	
UNIT II INHERITANCE, PACKAGES AND INTERFACES						
10	Overloading Methods & Objects as Parameters	17/9/22	4	LECTURE	BOARD & CHALK	
11	Returning Objects & Static, Nested and Inner Classes	19/9/22	4	LECTURE	BOARD & CHALK	
12	Inheritance: Basics & Types of Inheritance	20/9/22	1, 8	LECTURE	BOARD & CHALK	
13	Super keyword & Method Overriding	23, 24/9/22	8	LECTURE	BOARD & CHALK	
14	Dynamic Method Dispatch & Abstract Classes	26/9/22	4	LECTURE	BOARD & CHALK	
15	Final with Inheritance & Packages and Interfaces	27/9/22	1, 8	LECTURE	BOARD & CHALK	

16	Packages & Packages and Member Access	8/10/22	4	LECTURE	BOARD & CHALK	
17	Importing Packages	11/10/22	1,8	LECTURE	BOARD & CHALK	
18	Interfaces	12/10/22	4	LECTURE	BOARD & CHALK	
UNIT III EXCEPTION HANDLING AND MULTITHREADING						
19	Exception Handling basics & Multiple catch Clauses	14/10/22 15/10/22	8 1,8	LECTURE	BOARD & CHALK	
20	Nested try Statements	17/10/22	4	LECTURE	BOARD & CHALK	
21	Java's Built-in Exceptions & User defined Exception	18/10/22	1,8	LECTURE	BOARD & CHALK	
22	Multithreaded Programming: Java Thread Model	19/10/22	4	LECTURE	BOARD & CHALK	
23	Creating a Thread and Multiple Threads	25/10/22	4	LECTURE	BOARD & CHALK	
24	Priorities & Synchronization	28/10/22	8	LECTURE	BOARD & CHALK	
25	Inter Thread Communication	29/10/22	4	LECTURE	BOARD & CHALK	
26	Suspending & Resuming, and Stopping Threads	29/10/22	4	LECTURE	BOARD & CHALK	

27	Multithreading & Wrappers & Auto boxing.	31/10/22	4	LECTURE	BOARD & CHALK	
UNIT IV I/O, GENERICS, STRING HANDLING						
28	I/O Basics	4/11/22	8	LECTURE	BOARD & CHALK	
29	Reading and Writing Console I/O	7/11/22	4	LECTURE	BOARD & CHALK	
30	Reading and Writing Files	8/11/22	1/8	LECTURE	BOARD & CHALK	
31	Generics: Generic Programming	9/11/22	4	LECTURE	BOARD & CHALK	
32	Generic classes & Generic Methods	10/11/22	8	LECTURE	BOARD & CHALK	
33	Bounded Types	11/11/22	4	LECTURE	BOARD & CHALK	
34	Restrictions and Limitations	14/11/22	4	LECTURE	BOARD & CHALK	
35	Strings: Basic String class,	16/11/22	1/8	LECTURE	BOARD & CHALK	
36	Methods and String Buffer Class	18/11/22	8	LECTURE	BOARD & CHALK	
UNIT V JAVAFX EVENT HANDLING, CONTROLS AND COMPONENTS						
37	JAVAFX Events and Controls:Event Basics	22/11/22	1/8	LECTURE	BOARD & CHALK	
38	Handling Key and Mouse Events	23/11/22	4	LECTURE	BOARD & CHALK	

39	Controls: Checkbox & ToggleButton	25/11/22	8	LECTURE	BOARD & CHALK	
40	RadioButtons & ListView	28/11/22	4	LECTURE	BOARD & CHALK	
41	ComboBox & ChoiceBox	29/11/22	1.8	LECTURE	BOARD & CHALK	
42	Text Controls &ScrollPane.	30/11/22	4	LECTURE	BOARD & CHALK	
43	Layouts &FlowPane & HBox andVBox	5/12/22	8	LECTURE	BOARD & CHALK	
44	BorderPane &StackPane & GridPane.	7/12/22	1.4	LECTURE	BOARD & CHALK	
45	MenusBasics & Menu & Menu bars & MenuItem	12,13,14 16,17/12/22	8,4,1, 4,4,8	LECTURE	BOARD & CHALK	

TEXT BOOK:

1. Herbert Schildt, "Java: The Complete Reference", 11 th Edition, McGraw Hill Education, New Delhi, 2019
2. Herbert Schildt, "Introducing JavaFX 8 Programming", 1 st Edition, McGraw Hill Education, New Delhi, 2015

REFERENCES:

1. Cay S. Horstmann, "Core Java Fundamentals", Volume 1, 11 th Edition, Prentice Hall, 2018.
2. Padeepzhttps://padeepz.net
3. W3Schoolshttps://www.w3schools.com
4. Javatpointhttps://www.javatpoint.com

STAFF IN-CHARGE **HOD** **PRINCIPAL**

CS3391 Object Oriented Programming

UNIT - 1 Introduction To OOP and Java

1. Overview of OOP

Need of OOP

Major motivation of object Oriented programming is to overcome the limitations of Procedural programming.

OOP

OOP - Object Oriented Programming

OOP is a Programming Paradigms based on the Concept of objects. which may Contain data and Methods.

Data in the Form of field, known as attributes

Code in the Form of Procedure, known as Methods

List of OOP languages

C++, C#, COBOL, COBRA, J#, Java, LISP, Python, Scala, Smalltalk, Python, PHP, Visual Basic .NET, Ruby, Perl, Swift MATLAB.

1.2 Object Oriented Programming paradigms

OOP paradigm is a Programming methodology that Promotes the efficient design and development of s/w system.

This methods enable us to Create a set of objects that work together to produce s/w that is better understandable and models their problem domains than produced using traditional techniques.

The s/w Produced using oop Paradigm is easier to adapt to the changing requirements

Easier to Maintain

Create modules of functionality

Promote greater design

Be more robust &

Perform desired work efficiently.

1.3 Features of OOP

Features of OOP paradigm

→ Programs are divided into simple elements referred to as object.

→ Focus is on properties & functions rather than procedure.

→ Data is hidden from external functions

→ Functions operate on the properties of an object.

→ objects may Communicate with each other through a function called messaging.

→ follow the bottom-up approach in OOP design.

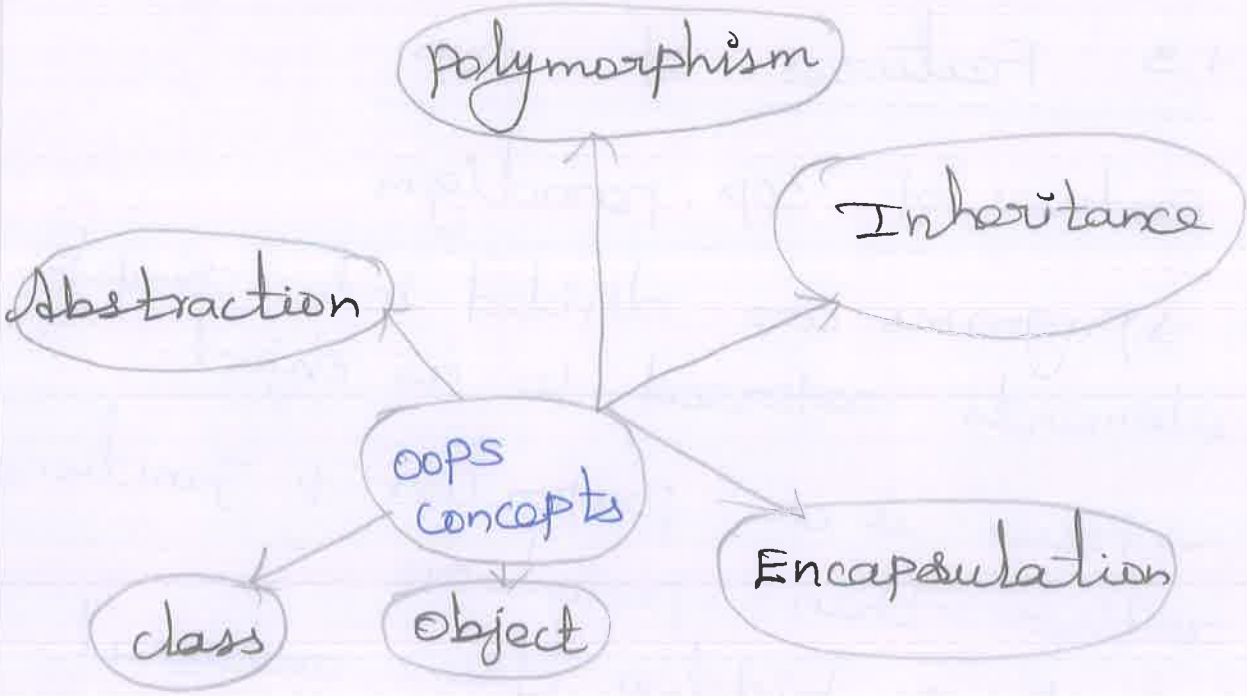
OOP Concepts

1. object 2. class 3. Abstraction 4. Encapsulation 5. Inheritance 6. Polymorphism 7. Method & Method passing

Object:

Pillars of OOPs

1. Abstraction
2. Encapsulation
3. Inheritance
4. Polymorphism < Compile-time, Runtime



Ex chair, bike, pen, table, car, mouse....

Object:

→ An object is a basic unit of oop that represents real-life entities.

→ An object is an instance of class which contains ~~both the data & functions~~ an address & takes up some space in memory.

An object mainly Consist of

1. state: It is represented by the attributes of an objects It also reflects the properties of an object.

2. Behaviors: It is represented by the methods of an object. It also reflects the response of an object to other objects.

3. Identity: It is a unique name given to the object that enables it to interact with

4. Method: A Method is a collection of statements that perform some specific task and return the result to the caller.

2. class:

→ A class is a user-defined blueprint or prototype from which objects are created.

→ Using classes you can create multiple objects with the same behavior instead of writing their code multiple times.

→ class declaration can include these component

1. Modifier 2. classname 3. superclass
4. Interfaces 5. Body {}.

object syntax

```
classname object = new classname();
```

Ex:

```
college mycollege = new college();
```

- college → Name of the class
- mycollege → object reference Variable
- = → assignment operator
- new → keyword
- college() → Constructor of the class

class syntax:

```
class <class_name>
{
 field;
 Method;
}
```

Ex:

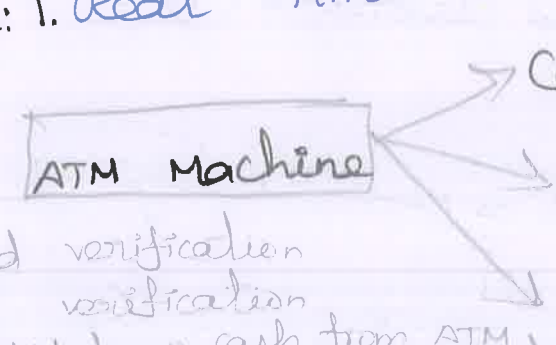
```
class user
{
string username;
string pwd;
string mailid;
register()
{
}
login()
{
}
}
```

3. Abstraction:

→ abstraction is the process of hiding certain details and showing only essential intmn to the user.

→ abstraction can be achieved with either abstract classes & Methods.

Ex: 1. Real Time Example: ATM Machine

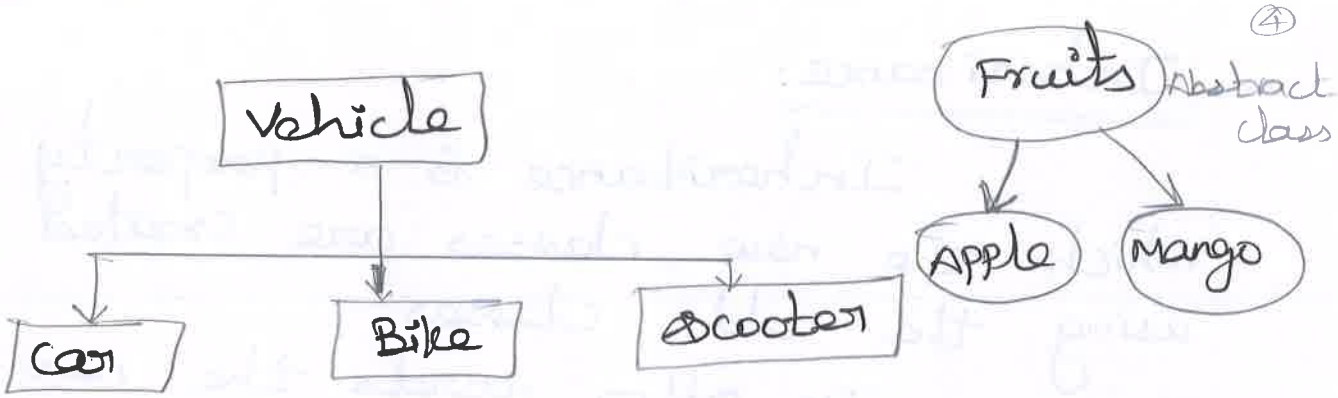


card verification
pin verification
To withdraw cash from ATM
validate the Amnt to be withdraw
update amount aftr withdraw

In our daily life all are using ATM, But we don't know internally what things are happening inside ATM machine.

2. SMS Sending

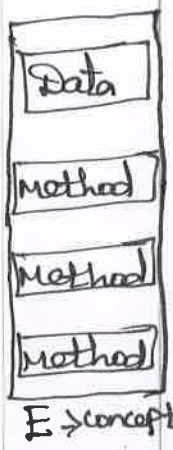
when you need to send SMS from your mobile, you only type the txt & send SMS. But you don't know the internal Processing of the message delivery



Encapsulation:

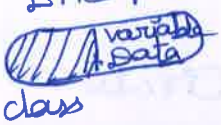
→ Encapsulation is the technique of wrapping of data & function into a single unit.

→ Binding variable & Methods under single entity.



Ex: capsule, school bag

Encapsulation



class

Advantages of Encapsulation:

→ Data Hiding → Increased Flexibility

→ Reusability → Testing code is easy

Polymorphism:

→ It is a Greek word. Poly refers many & Morphism refers forms.

→ It is the ability to take more than one form. (or)

It is the technique of using the same thing to perform different operations.

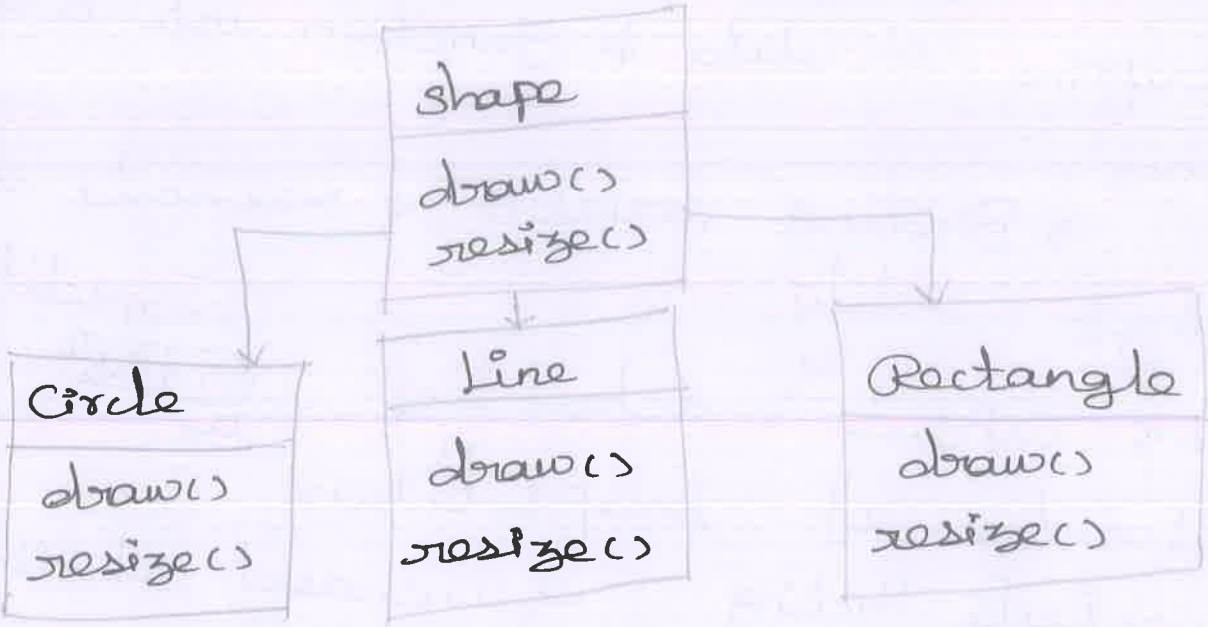
Types

1. Compile Time Polymorphism → Method overloading.
   Method overriding.

Inheritance:

Inheritance is a property by which the new classes are created using the old classes.

In other words the new classes can be developed using some of the properties of old classes.



superclass → parent class → Base class

sub class → child class → Derived class

Types

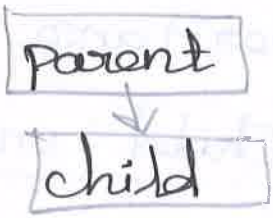
1. Single Inheritance
2. Multiple Inheritance
3. Multilevel Inheritance
4. Hierarchical Inheritance
5. Hybrid Inheritance.

Advantages:

→ It offers reusability
→ It is a technique of design & Code sharing
→ It support rapid development of S/w

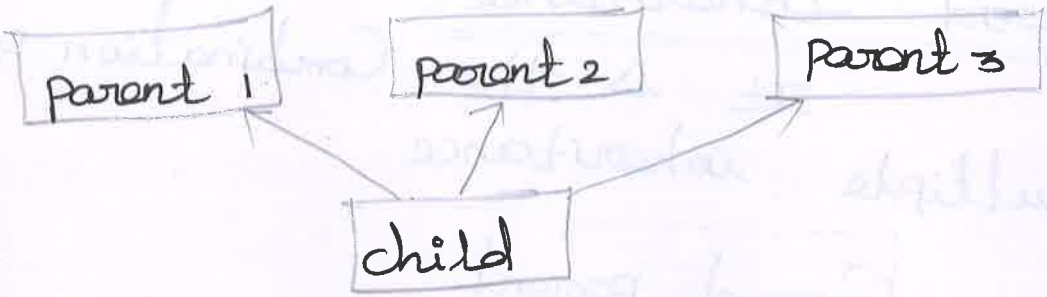
Single Inheritance:

→ If derived class have only one base class, then it is said to be single inheritance.



Multiple Inheritance:

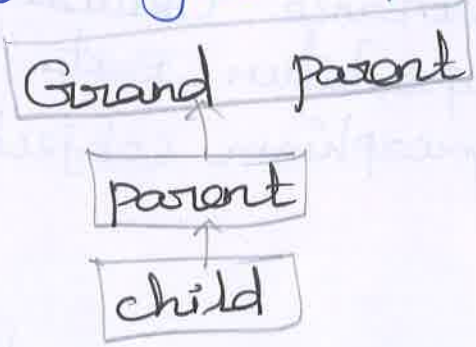
→ If derived class have more than one base class, it is said to be multiple Inheritance.



Multilevel Inheritance:

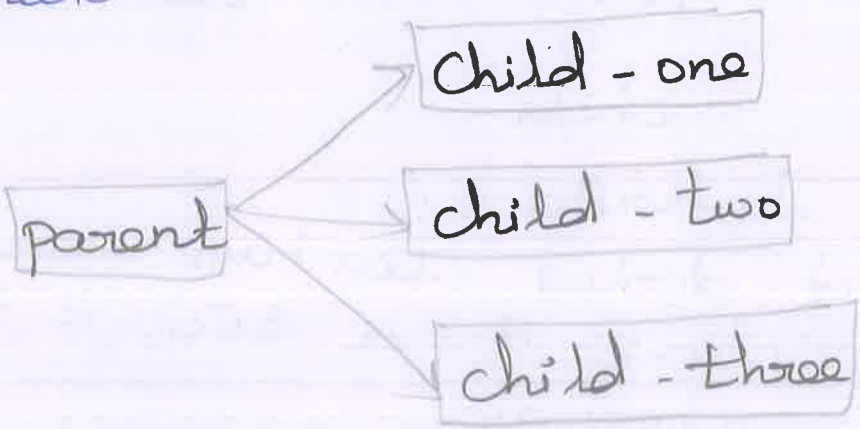
→ The derived class inherits the base class, which is turn inherits another class as its base class then it is said to be multilevel Inheritance.

→ The child class will inherits features from not only from parent, but also from grand parent.



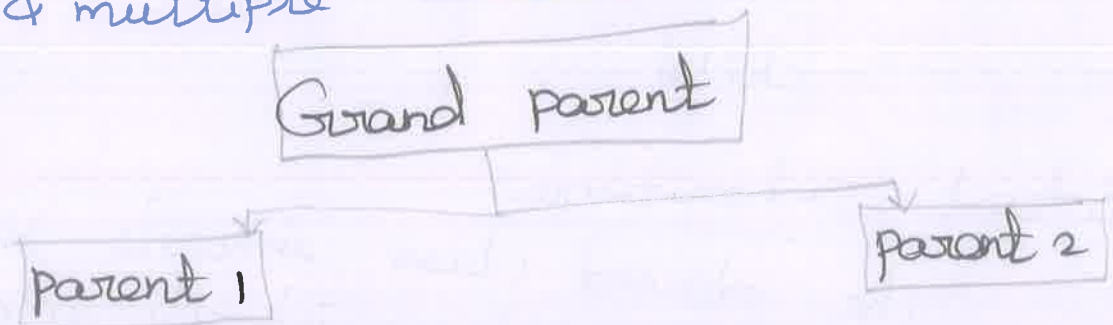
Hierarchical Inheritance:

It more than one derived classes are inherited from the same base class, then it is said to be hierarchical inheritance.



Hybrid Inheritance:

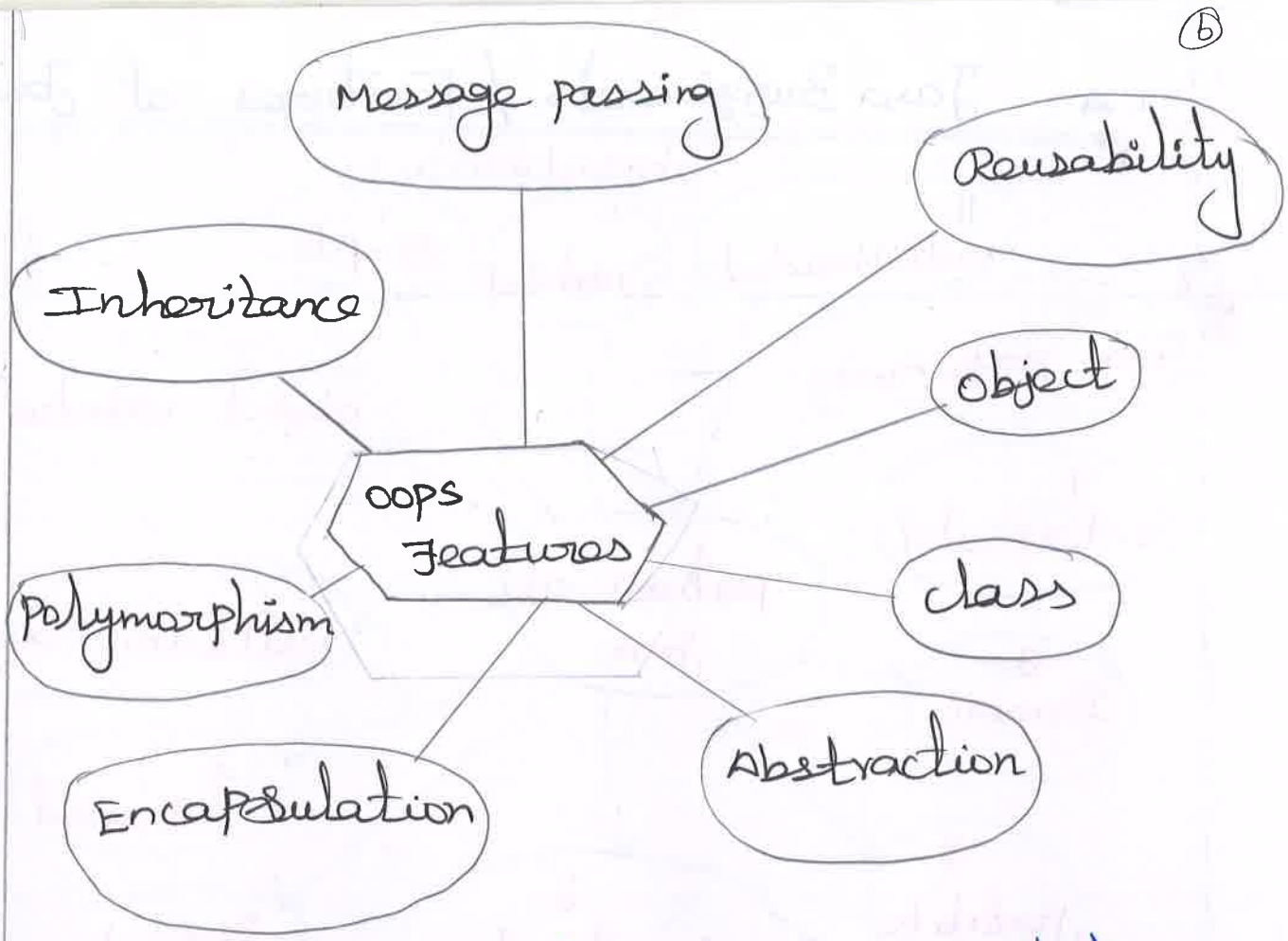
It is the Combination of multilevel & multiple inheritance.



1.3 Features of object oriented Programming

There are 3 major features in OOP.

1. Inheritance (Reusability)
2. Encapsulation (Data hiding & secure)
3. polymorphism (object to take many form)



→ Complex things are modeled as repeatable, basic structure in OOP.

→ OOP objects are reusable and maybe utilized in several applications

→ Modularity for easier trouble shooting

→ classes are easier to debug

→ Reuse of code through inheritance

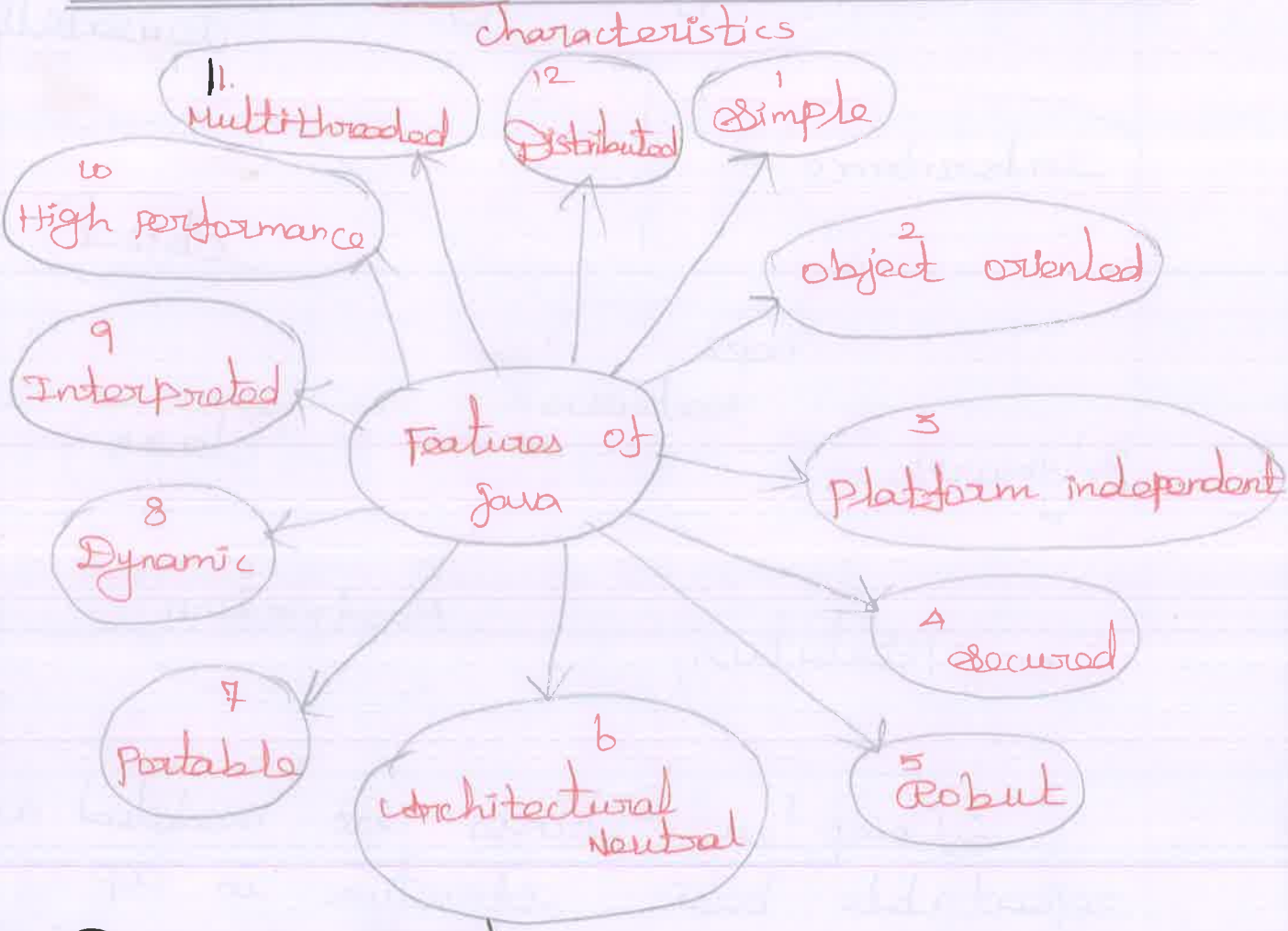
→ Bottom-up approach in Pgm design

→ Pgms organized around objects grouped in class.

→ Focus on data with methods to operate upon objects data.

→ Interaction b/w objects through

1.4 Java Buzzwords / Features of Java

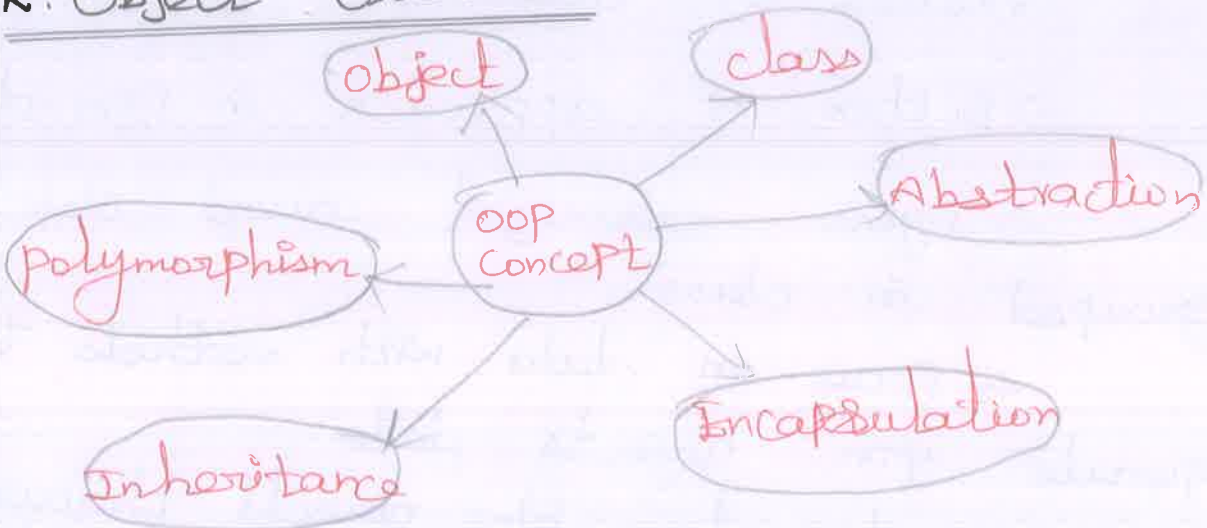


1. Java is Simple

→ Java syntax is simple and easy to understand.

→ No need to remove unreferenced objects because there is Automatic Garbage collection in java.

2. Object Oriented



→ oop based programming is ideally suited to big, Complicated & frequently updated (or) maintained projects.

3. Platform Independent

→ A platform is the h/w (or) s/w environment in which a program runs.

→ Java provides s/w based platform. It works across multiple platforms.

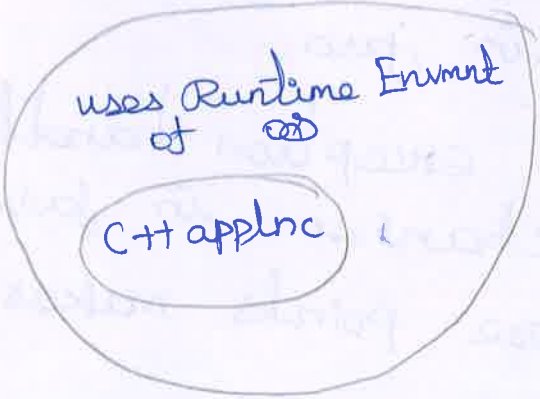
→ Java Code Can run on multiple platforms including windows, Linux, mac os & others.

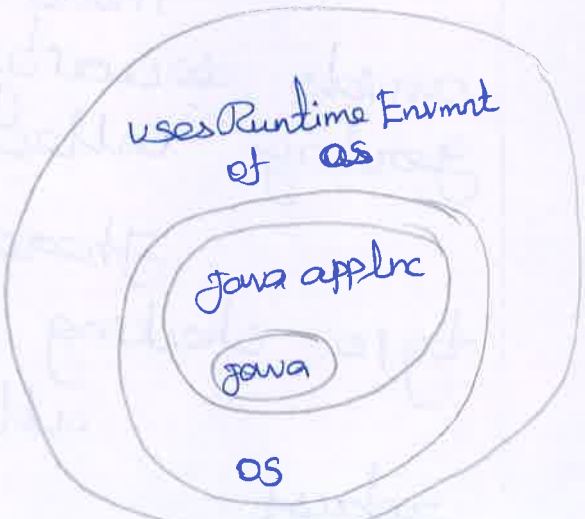
→ The Compiler Compiles java code & Convert it to byte code, because it Can operate on different sys, this byte code is platform independent (ie) write Once Run Anywhere (WORA)

4. Secure

Java is secured because

1. No explicit Pointer
2. Java Prgms run inside Virtual machine sandbox.





1. class loader 2. Bytecode verifier
3. Security Manager.

1. class loader:
adds security by separating the Package for the classes of the local files system from those that are imported from n/w sources.

2. Byte code Verifier:
checks the code fragments for illegal code that can violate access right to objects.

3. Security Manager:
It determines what resources a class can access such as reading & writing to the local disk.

5. Robust

Robust simply means strong. Java uses strong memory management. There are lack of pointers that avoids security problem. There is automatic garbage collection in java.

There is exception handling & type checking mechanism in java. all these points makes java robust.

6. Architectural Neutral:

There is no implementation dependent features eg size of primitive type is fixed.

In c programming, int data type occupies 2 bytes of memory for 32-bit architecture and 4 bytes of memory for 64-bit architecture.

But in java, it occupies 4 bytes of memory for both 32 and 64-bit architecture.

7. Portable:

Java pgms are portable because they are architecture independent. we may carry the java bytecode to any platform.

8. Dynamic:

Because of bytecode, java is considered dynamic.

It only loads the class file at runtime, as a result that occurs during runtime is dynamic

9. High Performance:

The performance of a java, bytecode Compiled java program is determined by how well the host JVM manages its given tasks & how well the

JVM utilizes the Computer h/w as is doing so.

10. Multi-Threaded

A thread is like a separate program, executing concurrently.

We can write Java programs that deal with many tasks at once by defining multiple threads.

The main advantage of multi-threading is that it doesn't occupy memory for each thread.

It shares a common memory area. Threads are important for multi-media, web applications etc.

11. Distributed:

We can create distributed applications in java.

RMI and EJB are used for creating distributed applications.

We may access files by calling the methods from any machine on the internet.

Mobile phones
Small projects
Games
Media app & browsers etc use the java language.

1.5 Overview of Java

→ James Gosling, Mike Sheridan & Patrick Naughton initiated the Java language Project in June 1991.

→ The small team of Sun engineers called "Green Team".

→ Initially it was designed for small, embedded sys in electronic appliances like set-top boxes.

→ Firstly, it was called "Greentalk" by james gosling & the file extension was .gt

→ After that, it was called Oak and was developed as a part of the Green project.

→ In 1995 oak was renamed as "Java" because it was already a trademark by oak technologies.

→ Initially developed by James Gosling at Sun Microsystem (which is now subidiary of Oracle Corporation) and released in 1995.

→ JDK 1.0 was released on Jan 23, 1996 After the first release of Java, there have been many additional features added to the language.

→ Java is being used in windows app, web app, enterprise app, mobile app, cards etc

Java Version History

Many java version have been released till now. The current stable release of java is java SE 10

1. JDK Alpha & Beta (1995)
2. JDK 1.0 (23rd Jan 1996)....
20. Java SE 18 (to be released by March 22)

Java is a Programming language and a platform.

Java is a high level, robust, OOP & secure pging language.

Platform:

Any H/w (or) S/w environmnt in which a pgms runs is known as a platform. Since Java has a runtime Environment (JRE) & API, it is called a platform.

Example

```
class Simple { public static void main
                (String args[]) {
System.out.println("Hello Java");
} }
```

Application: (3 billion devices run Java)

1. Desktop app such as media player, antivirus etc
2. web app such as irctc.co.in, javapoint.com etc
3. Enterprise app such as banking app
4. Mobile 5. Embedded sys 6. Smartcard 7. Robotics 8. Games etc

Java platforms / Editions

There are 4 platforms or editions of Java

1. Java SE (Java Standard Edition) (Desktop)
2. Java EE (Java Enterprise Edition) (web & enterpriseapp)
3. Java ME (Java Micro Edition) (Mobile App)
4. Java Fx (Internet app)

1.b Data types, Variables and Arrays

Data types specify the diffrnt sizes & values that can be stored in the variable.

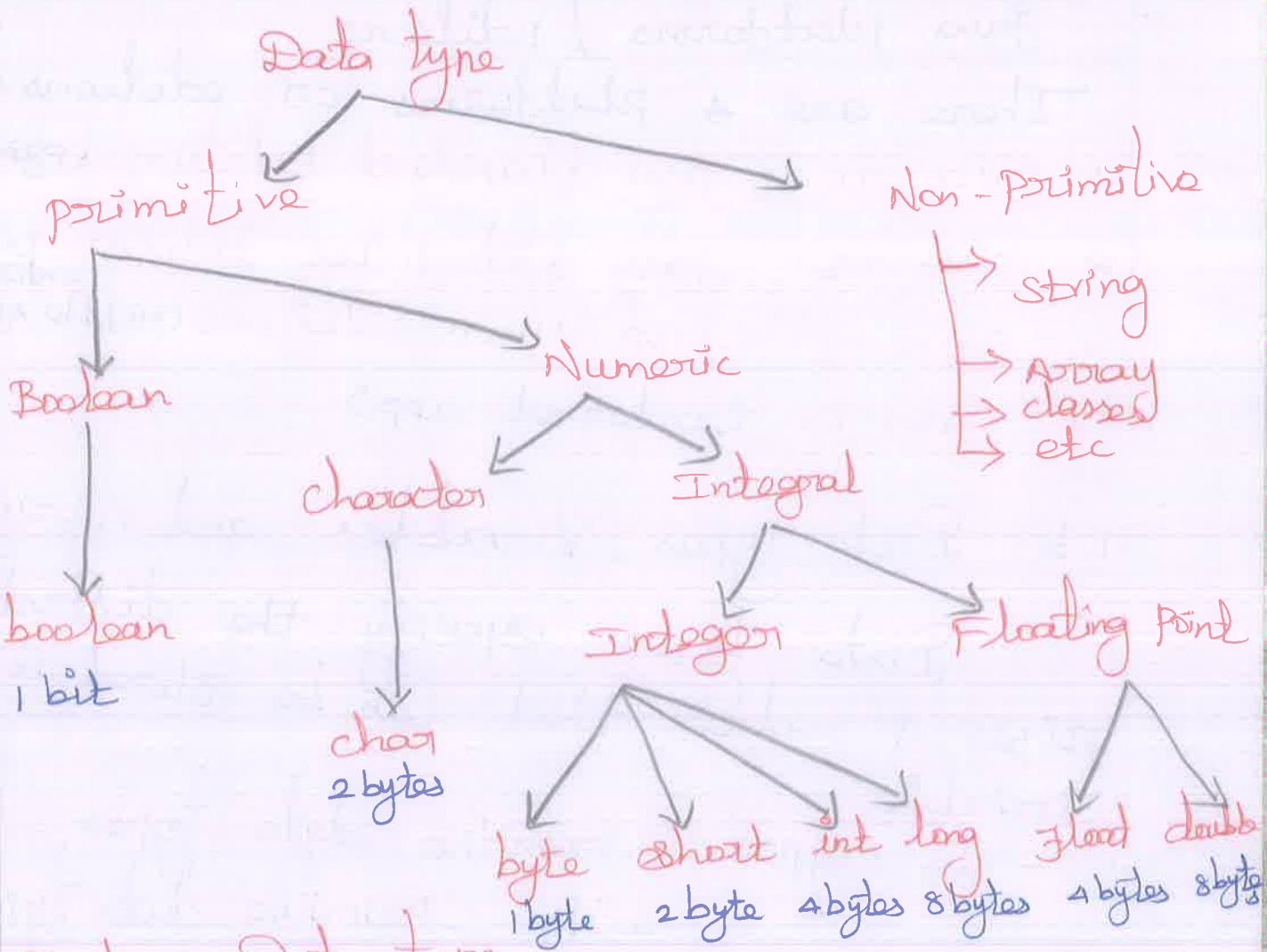
Two Types 1. primitive data types.
2. Non-primitive data types.

1. P.D.T

→ The primitive data types include Boolean, char, byte, short, int, long, float & double.

2. N.P.D.T

→ The Non-primitive data types include classes, interfaces & Arrays.



Boolean Data type

The Boolean data type is used to store only two possible values: True & False.

Ex: Boolean one = false.

Byte Data type

stores whole numbers from -128 to 127.

short stores whole numbers from -32,768 to 32,767

int stores whole numbers from -2,147,483,648 to 2,147,483,647.

long stores whole numbers from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,808

float stores fractional numbers. Sufficient for storing 6 to 7 decimal digits.

A floating point number can also be a scientific Num

double stores fractional numbers. sufficient for storing 15 decimal digits.
char stores a single character / letter (or) ASCII values.

byte

Ex: byte bNum = 100;
System.out.println(bNum);

short:

short sNum = 5000;
system.out.println(sNum);

Integer

int INum = 100000;
System.out.println(INum);

Float:

float f1 = 35e3f;
double d1 = 12E4d;
System.out.println(f1);
System.out.println(d1);

Variables

Variables are Containers for storing data values.

There are different types of variables

EX:
String - stores text, such as "Hello"
int - stores integers (whole numbers), int data = 50; // data is variable
float, char, boolean

Declaring (creating) variables

To create a variable, you must specify the type & assign it a value

Syntax:

```
type variableName = value;
```

- type → Data type
- variableName → Name of the variable
- = → equal sign is used to assign values to the variable.

Ex

① `String name = "John";`
`System.out.println(name);`

② `int myNum;`
`myNum = 15;`
`System.out.println(myNum);`

Types
1. local variable
2. instance variable
3. static variable

Types explⁿ (13) pge.

Display variables

The println() method is often used to display variables.

To combine both text and a variable use "+" character.

Ex:

```
String name = "John";
System.out.println("Hello" + name);
```

For numeric values, the + character works as a mathematical operator.

Ex:

```
int x=5; int y=6;
System.out.println(x+y);
```

Declare Many variables

To declare more than one variable of the same type.

Ex:

```
int x=5; int y=6; int z=50; System.Out.Println
                                (x+y+z);
```

One value to Multiple variables

you can also assign the same value to multiple variables

Ex:

```
int x, y, z;  x=y=z=50;
System.out.println (x+y+z);
```

Non-Primitive Data types

Non-P DT are called reference types because they refer to objects.

→ P.T are predefined (already defined) in Java.

→ N.P.T are created by the programmer & is not defined by java.

→ N.P.T can be used to call methods to perform certain operation.

→ A P.T has always a value, while non-primitive types can be null.

→ A P.T starts with a lowercase letter, while non-primitive types starts with an uppercase letter

→ The size of a P.T depends on the data type, while non-P.T types have all the same size.

Arrays A is a collection of similar type of elements which has contiguous m/y allocation.

→ Arrays are used to store multiple values in a single variable, instead of declaring separate variables for each value.

→ To declare an array, define the variable type with square brackets

```
String[] cars;
```

To insert values to it, we can use an array in a comma-separated list, inside curly braces.

```
String[] cars = {"volvo", "BMW", "Ford",
                 "Mazda"};
```

To create an array of integers

```
int[] myNum = {10, 20, 30, 40};
```

Access the Elements of an Array

Access an array element by referring to the index number.

```
String[] cars = {"volvo", "BMW", "Ford"};
System.out.println(cars[0]);
```

o/p = volvo

1) Local variable

A variable declare inside the body of the method is called local variable.

2) Instance variable

A V declared inside the class but outside the body of the method, is called an instance variable.

3) Static variable

A V that is declared as static is called a static variable. It cannot be local.

Ex:

```
public class A
{ static int m=100; //static variable
  void method()
  { int n=90; //local variable
  }
  public static void main (String args[])
  { int data =50; //instance variable
  }
}
```

Students workout

1. Add Two Numbers
2. widening
3. Narrowing (Typecasting)
4. overflow
5. Adding Lower Type

In Java array is an object of a dynamically generated class. Java array inherits the object class & implements the Serializable as well as Cloneable interfaces.

Java provides the feature of anonymous arrays which is not available in C/C++.

Advantages

1. Code optimization (retrieve or sort data efficiently)

2. Random access

Disadvantages

Size limit: we can store only the fixed size of elements in the array. To solve this problem, Collection framework is used in Java which grows automatically.

Types of Array in Java

1. Single Dimensional Array
2. Multi Dimensional Array

Single Dimensional Array

Syntx:

dataType [] arr; (or) datatype [] arr; (or)
datatype arr[];

Instantiation of an Array

```
arrayRefvar = new datatype[size];
```

Ex:

```
class Testarray
{
public static void main(String args[])
{
int a[] = new int[5]; //declaration & instantiation
a[0] = 10; //initialization
a[1] = 20;
a[2] = 70;
a[3] = 40;
a[4] = 50;
//Traversing Array
for(int i=0; i<a.length; i++) //length is the property of Array
System.out.println(a[i]);
}
}
```

o/p 10 20 30 40 50

Multidimensional Array in Java

In such case, data is stored in row and column based index (also known as matrix form)

Syntax:

```
dataType[][] arrayRefVar; (or)
dataType [][]arrayRefVar; (or)
dataType arrayRefVar[][]; (or) dataType [][]arrayRefVar;
```

Ex:

```
int[][] arr = new int[3][3]; //3 rows & 3 column
```

Initialize Multidimensional Array in Java

```
arr[0][0]=1; arr[0][1]=2; arr[0][2]=3;
arr[1][0]=4; arr[1][1]=5; arr[1][2]=6;
arr[2][0]=7; arr[2][1]=8; arr[2][2]=9;
```

1.7 Operators

Operator in java is a symbol that is used to perform operations.

Types

1. Unary Operator
2. Arithmetic operator
3. Shift operator
4. Relational operator
5. Bitwise operator
6. Logical operator
7. Ternary operator
8. Assignment Operator.

Java operator precedence.

operator Type	Category	precedence
Unary	postfix	exp++ exp--
	prefix	
Arithmetic	multiplicative	* / %
	additive	+ -
Shift	shift	<< >> >>>
Relational	Comparison	< > <= >= instanceof
	equality	== !=
Bitwise	bitwise AND	&
	Exclusive OR	^

Logical	Logical AND	&&
	Logical OR	||
Ternary	ternary	?:
Assignment	assignment	= += -= *= /= %= &= ^= |= <<= >>= >>>=

Java Unary operator

Unary operators are used to perform various operations i.e:-
incrementing / decrementing a value by one
negating an expression
inverting the value of a boolean

Ex:

```
public class OperatorEx
{
public static void main (String args[])
{
int x=10;
System.out.println (x++); // 10 (11)
System.out.println (++x); // 12
System.out.println (x--); // 12 (11)
System.out.println (--x); // 10
}}
```

O/P

```
10
12
12
10
```

Arithmetic operators

Java Arithmetic operators are used to perform addition, subtraction, Multiplication & division.

Ex:

```
public class operatorEx
{public static void main (String args[])
```

```
int a=10; int b=5;
System.out.println(a+b);
System.out.println(a-b);
System.out.println(a*b);
System.out.println(a/b);
System.out.println(a%b); }}
```

O/P

15
5
50
2
0

AND operator : Logical && and Bitwise &

The logical && operator doesn't check the second condition if the first condtn is false. It checks the second condition only if the first one is true.

The bitwise & operator always checks both conditions whether first condition is true (or) false.

```
public class OperatorEx
{
public static void main(String args[])
{
int a=10; int b=5; int c=20;
System.out.println(a<b && a<c);
System.out.println(a<b & a<c);
}}
```

O/P

false
false

OR operator: Logical || and Bitwise |

The logical || operator doesn't check the second condition if the first condition is true. It checks the 2nd Condition only if the first condition is true (or) false.

Ternary Operator (Conditional operator)

Java T.O is used as one line replacement for if-then-else stmnt & used a lot in java pgming. It is the only Conditional operator which takes three operands.

Ex:

```
public class OperatorEx
{
public static void main(String args[])
{
int a=2; int b=5;
int min = (a<b) ? a:b;
System.out.println(min);
}}
```

O/P
2

Assignment operator

A.O is one of the most common operators. It is used to assign the value on its right to the operand on its left

Ex:

```
public class OperatorEx
{
public static void main(String args[])
{
int a=10; int b=20; // a=a+4 (a=10+4)
a+=4; b-=4;
System.out.println(a);
System.out.println(b);
}}
```

O/P
14
16

1.8 Control statements

→ Java Compiler executes the code from top to bottom. The stmnts in the code are executed according to the order in which they appear & can be used to control the flow of java code.

→ Such stmnts are called control flow stmnts.

Types

1. Decision Making stmnts
   - → if stmnts
   - → switch stmnts
2. Loop Stmnts
   - → do while loop
   - → while loop
   - → for loop
   - → for each loop
3. Jump stmnts
   - → Break stmts
   - → Continue stmnts

Decision - Making stmnts:

→ Decision-making stmnts decide which stmnt to execute & when.

If stmnt:

If stmnt is used to evaluate a Condition. The control of the pgm is diverted depending upon the specific Condition.

The Condition of the If stmnt gives Boolean value, either true or false.

Types
1. Simple if stmnt
2. If - else stmnt
3. If - else - if ladder
4. Nested if - stmnt.

If Stmnt:

The if stmnt executes a block of Code only if the specified expression is true.

If the value is false, then the if block is skipped & execution continues with the rest of the pgm.

Syntax:

```
if (<conditional expression>)
    <statement action>
```

```
public class PgmIF
{
public static void main (String [] args)
{
int a=10, b=20;
if (a>b)
System.out.println ("a>b");
if (a<b)
System.out.println ("b<a");
}}
```

If-else stmnt

The if/else stmnt is an extension of the if stmnt.

If the condition in the if stmnt fails, the stmnts in the else block are executed.

syntax:

```
if (conditional expression)
    <stmnt action>
else
    <stmnt action>
```

Ex:

```
public class Program_If_Else
{
public static void main (String [] args)
{
int a=10, b=20;   if (a>b)
                  {
        System.out.println ("a>b");
                  }
             else
                  {
        System.out.println ("b<a");
                  }}}
```

Switch Case Stmnt:

The switch case stmnt is also called as multi-way branching stmnt with several stmnts choices.

If-else-if ladder:

The if-else-if stmnt contains the if-stmnt followed by multiple else-if stmnts.

Syntax:

```
if (condition)
{
 statement; //executes when Condtn 1 is tru
 }
 else if (condition 2)
 {
  stmnt 2; //executes when contn 2 is true
  }
 else
  {
   stmnt 3; // executes when all the condtns
                                are false.
   }
```

Ex:

```
public class Student
{
public static void main (String[] args)
{
String city = "Delhi";
if (city == "meerut")
{
System.out.println ("city is meerut");
}
else if (city == "Noida")
```

```
{
System.out.println("city is noida");
}
else if(city=="Agra")
{
System.out.println("city is agra");
}
else
{
System.out.println(city);
}}}
```

o/p

Delhi

Nested if-stmnt

In nested if-stmnts, the if stmnt can contain a if or if-else stmnt inside another if or else-if stmnt.

syntax:

```
if(condition 1)
{
stmnt 1; // executes when cndtn 1 is true
if(condition 2)
{
stmnt 2; // executes when cndtn 2 is true
}
else
{
stmnt 2; // executes when cndtn 2 is false.
}}
```

Ex:

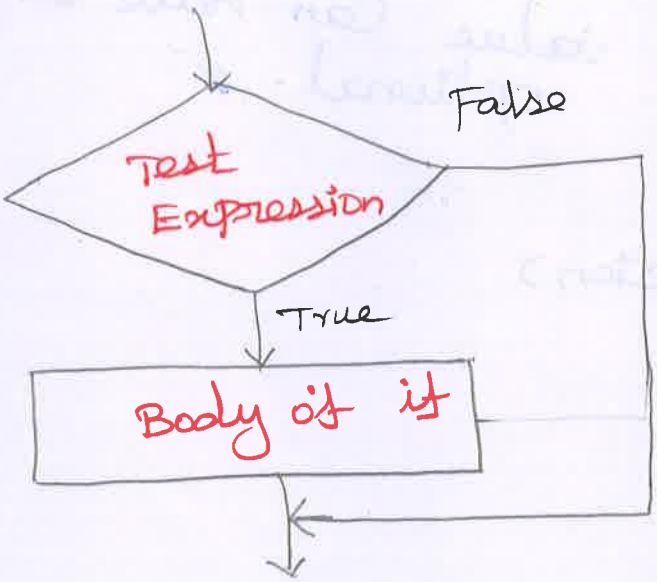
```
public class student
{
public static void main (String[] args)
{
String address = "";  int i = 10;
 if (i == 10)
 {
  if (i<15)
  System.out.println ("i is Smaller than 15");
  if (i<12)
  System.out.println ("i is Smaller than 12");
 else
  System.out. println ("i is greater than 15");
 } } }
```

o/p

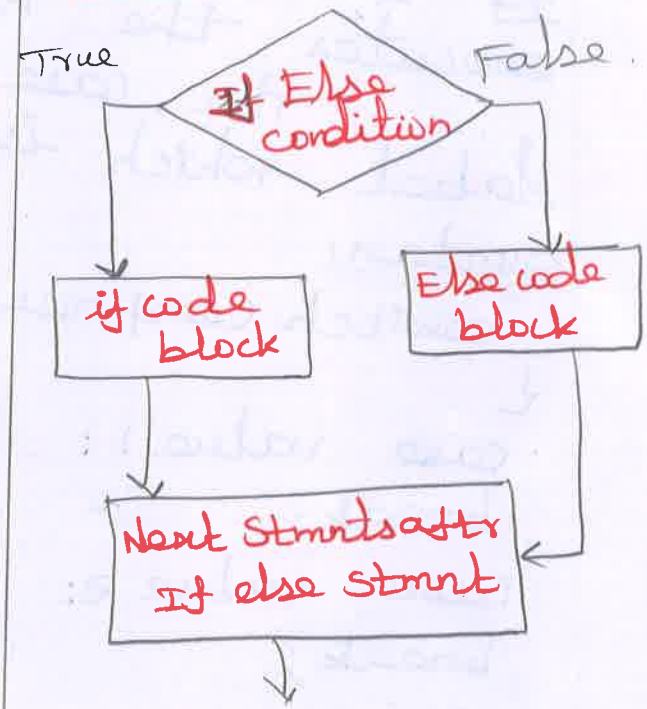
i is Smaller than 15

i is smaller than 12

if



if - else



Switch Stmnts:-

Switch stmnts are similar to if-else-if stmnts.

Java switch stmnt executes one stmnt from multiple Conditions.

There can be one or N number of Case values for a switch expression.

The case value must be literal or Constant. It does not allow Variables.

The case values must be unique. In case of duplicate value, it renders Compile-time error.

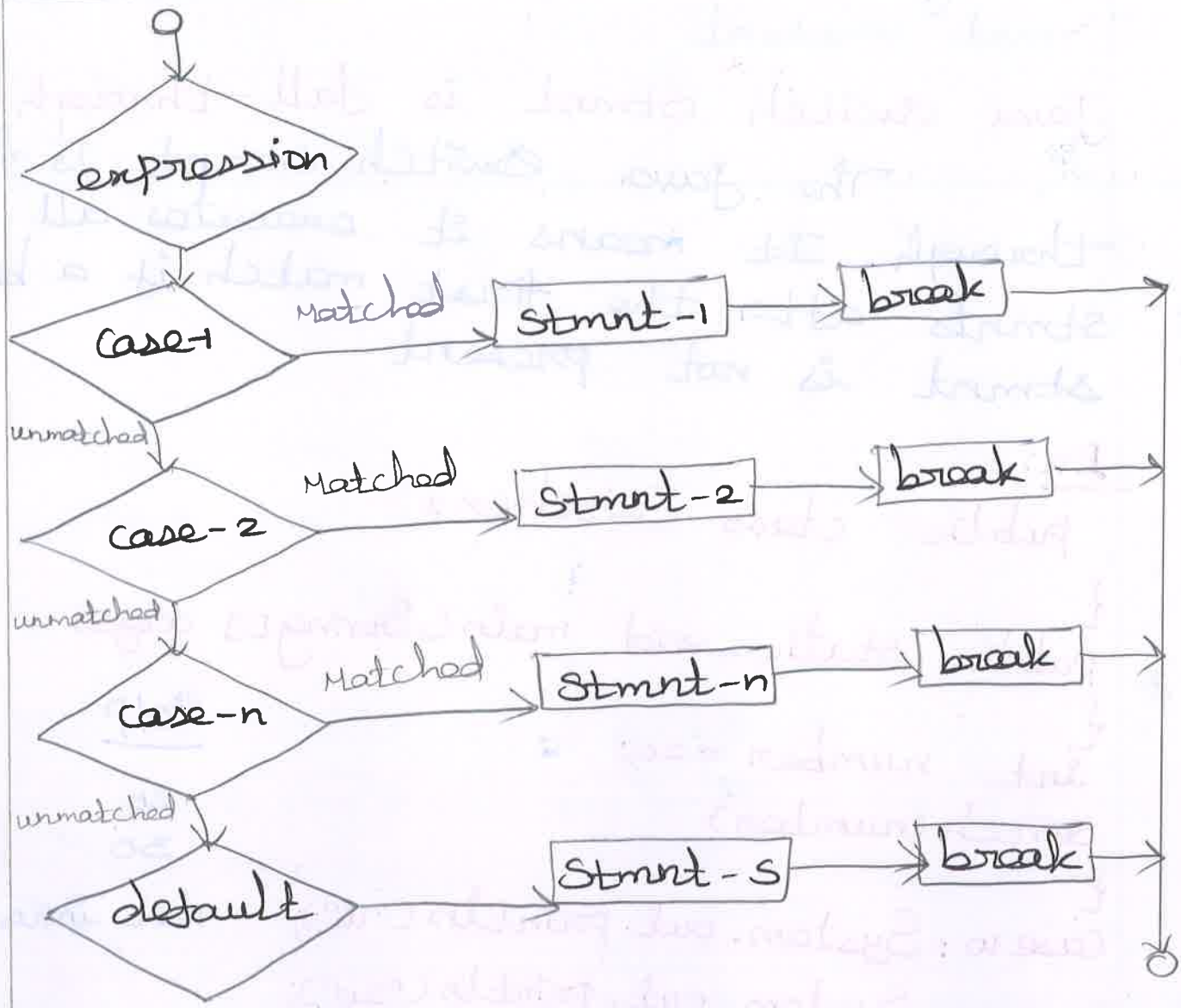
Each case stmnt can have a break stmnt which is optional. When Control reaches to the break stmnt, it jumps the Control after the switch expression. If a break stmnt is not found, it executes the next case.

The case value can have a default label which is optional.

Syntax:

```
switch (expression)
{
 case value 1:
 break;
 case value 2:
 break;
 ....
 default:
   code to be executed if all cases not matched;
}
```

Flowchart of switch stmnt.



Ex

```
public class switchEnample
{
public static void main(String[] args)
{
int number = 20;
switch(number)
{
case 10: System.out.println("10");
break;
case 20: System.out.println("20");
break;
default: System.out.println("Not in 10, 20 ...");
}}
```

o/p

20

Finding Month Ex (switch case)
Vowel constant

Java switch stmnt is fall-through

The java switch stmnt is fall-through. It means it executes all stmnts after the first match if a break stmnt is not present.

Ex:

```
public class SwitchEx2
{
public static void main(String[] args)
{
int number = 20;
switch(number)
{
case 10: System.out.println("10");
case 20: System.out.println("20");
case 30: System.out.println("30");
default: System.out.println("Not in 10, 20 or 30");
}}}
```

O/P

```
20
30
Not in 10, 20 or 30
```

java switch stmnt with string

java Nested switch stmnt

We can use switch stmnt inside other switch stmnt in java. It is known as nested switch stmnt.

Ex:

```
public class NestedSwitchEx
{
public static void main(String args[])
{
  // C-CSE , E-ECE , M-Mechanical
char branch = 'c';
int collegeyear =4;
switch (collegeyear)
{
case 1:
 System.out.println (" English, Maths, Science");
 break;
case 2:
  switch (branch)
{
 case 'c':
 System. out. println (" OS, Java, Ds");
 break;
 case 'E':
 System.out. println (" MP , LST ");
break;
case 'M':
 System.out. println (" Drawing , MM");
break;
 }
 break;
case 3:
  switch (branch)
{
case 'c':
```

```
System.out.println("Computer O, Multimedia");
break;
case 'E':
System.out.println("Fundamentals of Logic
    design, Microelectronic");
break;
case 'M':
 System.out.println("Interval Combustion Engine,
                     Mechanical Vibration");
 break;
}
break;
case 4:
 switch(branch)
{
case 'C':
System.out.println("Data Communication & N/Ws,
                    Multimedia");
break;
case 'E':
System.out.println("Embedded Sys, Image
                    Processing");
break;
case 'M':
System.out.println("production Technology,
                    Thermal Engineering");
break;
} break;
}}}
```

O/P

Data Communication and N/Ws, Multimedia

Java Enum in switch stmnt

Java allows us to use enum in switch stmnt. Java enum is a class that represent the group of constants. we use the keyword enum and put the constants in curly braces separated by commas.

public enum Day {Sun, Mon, Tues, Wed, Thu, Fri, Sat};

Java wrapper in switch stmnt

Java allows us to four wrapper classes: Byte, short, Integer & Log in switch stmnt. (Eligible for vote pgms)

Loops in Java

It's execute a block of code for several number of times until the condition is true.

Three types of for loops in java

1. For loop
2. while loop
3. do-while loop

For loop

1. simple for loop
2. For each or Enhanced for loop
3. Labeled for loop.

Java Simple for loop

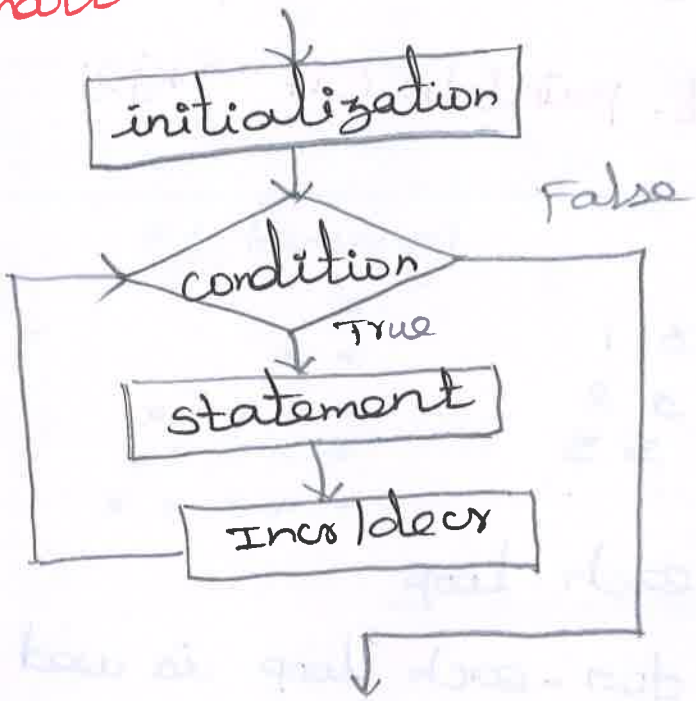
We can initialize the variable, check condition and increment/decrement value. It consists of four parts:

1. **Initialization:** It is the initial condition which is executed once when the loop starts.
2. **Condition:** It is the second condition which is executed each time to test the condition of the loop. It continues execution until the condition is false.
3. **Increment/decrement:** It increments or decrements the variable value. It is an optional condition.
4. **statement:** The statement of the loop is executed each time until the second condition is false.

Syntax

```
for(initialization; Condition; increment/decrement)
{
//statement or code to be executed
}
```

Flowchart



Ex:

```
public class Forex
{
public static void main (String[] args)
{
for (int i=1; i<=10; i++)
{
System.out.println(i);
} } }
```

O/P

1
2
3
4
5
6
7
8
9
10

Java Nested for loop

For loop inside the another loop it is known as nested for loop. The inner loop executes completelly whenever outer loop executes.

Ex:

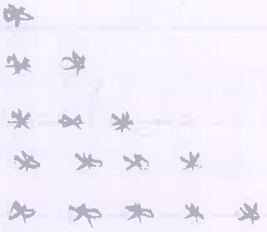
```
public class Nestedforex
{
public static void main (String[] args)
{
for(int i=1; i<=3; i++)
{
```

```
for (int j=1; j<=3; j++)
{
System.out.println(i+" "+j);
}}}}
```

o/p

```
1 1   2 1   3 1
1 2   2 2   3 2
1 3   2 3   3 3
```

Pyramid Ex



Java for-each Loop

The for-each loop is used to traverse array or collection in java.

It is easier to use than simple for loop because we don't need to increment value and use subscript notation

syntax

```
for(data-type variable : array-name)
{
//code
}
```

Ex:

```
public class Foreachex
{
public static void main(String[] args)
{
int arr[] = {12,23,44,56,78};
for(int i :arr)
{
System.out.println(i);
}}}
```

o/p

```
12
23
44
56
78
```

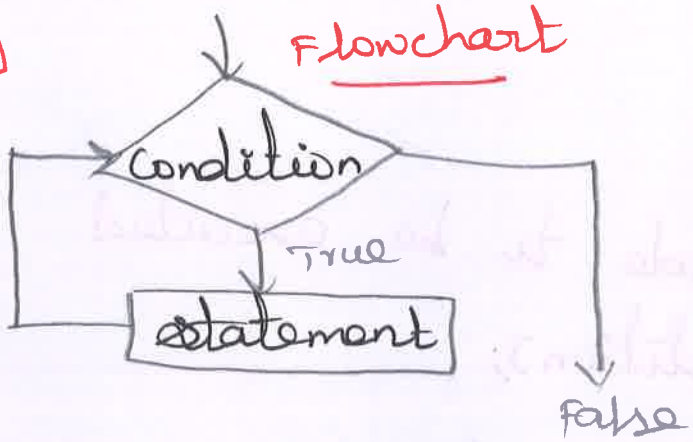
Java while Loop

The Java while loop is used to iterate a part of the pgm repeatedly until the specified boolean codition is true, the boolean condition becomes false the loop automatically stopes.

Syntax:

```
while (condition)
{
  Increment / decrement statement
}
```

Flowchart



Ex:

```
public class whileEx
{
public static void main (String[] args)
{
 int i=1;
 while (i<=10)
{
System.out.println(i);
 i++;
 }
}
}
```

O/P

1
2
3
4
5
6
7
8
9
10

Java do-while loop

The do-while loop is similar to the while loop, except that the test condition is performed at the end of the loop instead of at the beginning.

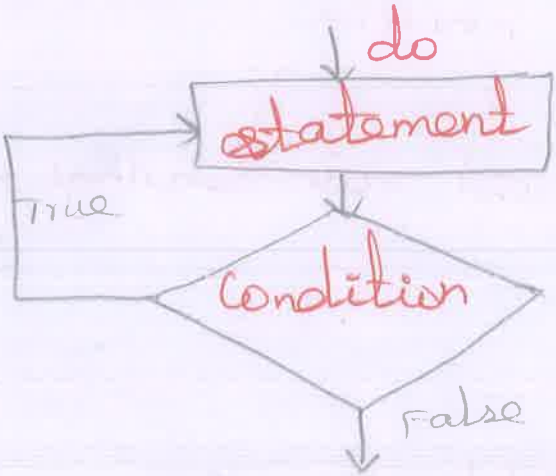
The do-while loop executes atleast once without checking the condition.

It begins with the keyword do, followed by the statements that making up the body of the loop.

Syntax:

```
do
{
// loop body / code to be executed
}while (condition);
```

Flowchart



Ex:

```
public class Dowhile Ex
{
public static void main(String[] args)
{
   int i = 1;
```

```
do
{
System.out.println(i);
i++;
} while (i<=10);
}}
```

o/p

1
2
3
4
5
6
7
8
9
10

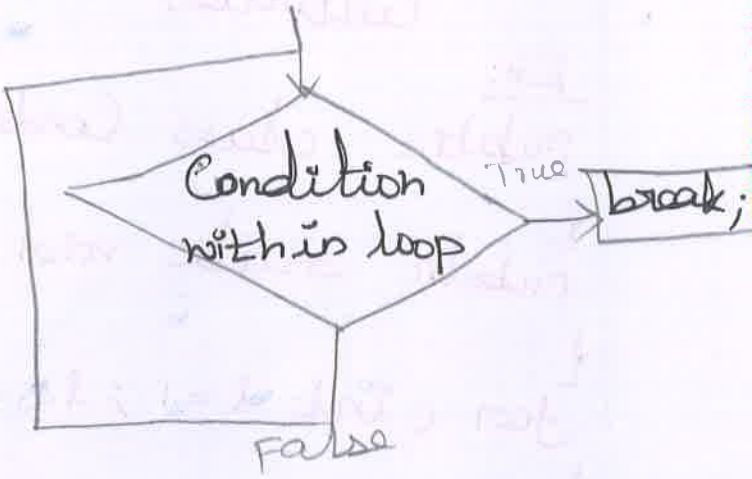
Break stmnt:

The Java break stmnt is used to break loop or switch stmnt. It breaks the current flow of the pgm at specified condition.

we can use Java break stmnt in all types of loops such as for loop, while loop & do-while loop

Syntx

```
jump-stmnt;
break;
```



Ex:

```
public class BreakEx
{
public static void main(String[] args)
{
for (int i=1; i<=10; i++)
{ if (i==5)
  { break;
  }
```

o/p

1
2
3
4

```
System.out.println(i);
}
}
}
```

Continue Stmnt

The java Continue stmnt is used to Continue the loop. It Continues the current flow of the pgm and skips the remaining code at the specified condition.

we can use java Continue stmnt in all types of loops such as for loop, while loop & do-while loop.

Syntax:

```
jump-stmt;
continue;
```

Ex:

```
public class ContinueEx
{
public static void main(String[] args)
{
for(int i=1;i<=10;i++)
{
 if(i==5)
{
 continue;
 }
 System.out.println(i);
 }
}
}
```

O/P

```
1
2
3
4
6
7
8
9
10
```

1.9 Programming structures in Java

Basic Structure of Java Programs

A Java pgm involves the following sections:

Documentation section
package stmnt
Import stmnt
Interface stmnt
class Defn
Main Method class
Main Method Defn

section	Description
Documentation section	Comments are beneficial for the programmer because they help them understand the code.
Package statement	A package is a group of classes that are defined by name. You can create a package with any name. It is an optional part of the Prgm. declaration: Package package-name;

Import statements	This line indicates that if you want to use a class of another package. Ex: import calc.add;
Interface stmnt	Interfaces are like a class that includes a group of method declarations.
class Defn	classes are the main and essential elements of any java program.
Main Method class	Every Java standalone pgm requires the main method as the starting point of the program. This is an essential part of a Java program.

A Simple Java program to print "Hello Java"

Ex: // Name of this file will be "Hello. Java"

```
public class Hello
{
public static void main (String[] args)
```

```
{
System.out.println("Hello Java");
}}
```

O/P

Hello Java

1.10 Defining classes in Java

In OOP, a class is a basic building block.

A class can also be called a logical template to create the objects that share common properties and methods.

Java provides a reserved keyword class to define a class. The keyword must be followed by the class name. Inside the class we declare methods and variables.

In general, class declaration includes the following in the order as it appears:

1. Modifiers 2. class keyword 3. class name
4. Superclass (if any) 5. interfaces (if any)
6. Body {}.

Syntax:

```
<access specifier> class  class-name
{
// member variables
// class methods
}
```

Ex: calculate.java

```
public class Calculate //class defn
{
// instance variables
   int a; b;
//Constructor to instantiate
public Calculate (int x, int y)
{
this.a = x;
this.b = y;
}
// method to add numbers
public int add()
{
int res = a+b;
return res;
}
// method to subtract numbers
public int subtract()
{ int res = a-b; return res; }
```

```
// method to multiply numbers
public int multiply()
{
  int res = a*b;
  return res;
}
//main method
public static void main(String[] args)
{
  // creating object of class
  Calculate c1 = new Calculate(45,4);
  // calling the methods of calaulate class
  System.out.println("Addition is:" + c1.add());
System.out.println("subtraction is:" + c1.subtract());
System.out.println("Multiplication is:" + c1.multiply());
System.out.println("Division is:" + c1.divide());
}
```

O/P

```
javac calculate.java
java Calculate
Addition is :49
Subtraction is :41
Multiplication is :180
Division is :11.
```

1.11 Constructors

In Java, a Constructor is a block of codes similar to the method. that is used to initialize the state of an object is a class through a new operator.

The sole purpose of the Constructor is to initialize the data fields of objects in the class.

special type of method which is used to initialize the object.

Rules for creating Java Constructor

1. Constructor name must be the same as its class name.
2. A constructor must have no explicit return type.
3. A Java Constructor cannot be abstract, static, final and synchronized.

Types of Java Constructor

1. Default c
2. parameterized c

Types of J Constructor

Default Constructor

parameterized constructor

1. Default Constructor (Non-parameterized constructor)

A Constructor is called "Dc" when it doesn't have any parameter.

Syntax:

```
<class-name>()
{
}
```

Ex:

```
class Bike1
{
Bike1() // creating a default constructor.
{
System.out.println("Bike is created");
}
// main method
public static void main(String args[])
{
Bike1 b = new Bike1();
}}
```

o/p

Bike is created.

Purpose of Dc

1. The Dc is used to provide the default values to the object like 0, null, etc., depending on the type.

2. Parameterized Constructor

A Constructor which has a specific number of parameters is called parameterized Constructor.

Use:

The parameterized Constructor is used to provide different values to distinct objects.

Ex:

```
class Student4 {
  int id;
 String name;
 // creating parameterized Constructor
 Student4 (int i, String n)
 {
  id = i;   name = n; }
 //methods to display the values
 void display ()
{
System.out.println (id + " " + name);
  }
public Static void main (String args[])
{
// creating objects and passing values
Student4 s1 = new Student4 (111, "karan");
Student4 s2 = new Student (222, "Aryan");
```

```
//Calling method to display the values to object
        s1.display();
        s2.display();
    }
}
```

o/p
111 karan
222 kavin

Constructor overloading

Constructor overloading in java is a technique of having more than one Constructor with different parameter lists. They arranged in a way that each constructor performs a different task.

They are differentiated by the Compiler by the number of parameters in the list and their types.

Ex:

```
class Student // Java pgm to overload Constructors.
{
    int id;
    String name;
    int age;
// creating two arg Constructor
Student (int i, String n)
{
    id i;
```

```
    name = n;
}
// creating three args Constructor
Student (int i, String n, int a)
{
  id = i;
name = n;
age  = a;
}
void display ()
{
System.out.println (id + " " + name + " " + age);
}
public static void main (String args[])
{
Student s1 = new Student (111, "karan");
Student s2 = new Student (222, "kavin", 25);
 s1.display ();
 s2.display ();
}}
```

O/P

111 karan 0

222 kavin 25

Difference b/w Constructor and method

Java Constructor	Java Method
A Constructor is used to initialize the state of an object.	A method is used to expose the behavior of an object.

A Constructor must have a return type.	A method must have a return type.
The Constructor is invoked implicity.	The method is invoked explicitly.
The Java Compiler provides a default constructor if you don't have any constructor in a class.	The method is not provided by the compiler in any case.
The Constructor name must be same as the classname	The method name may or may not be same as the class name.

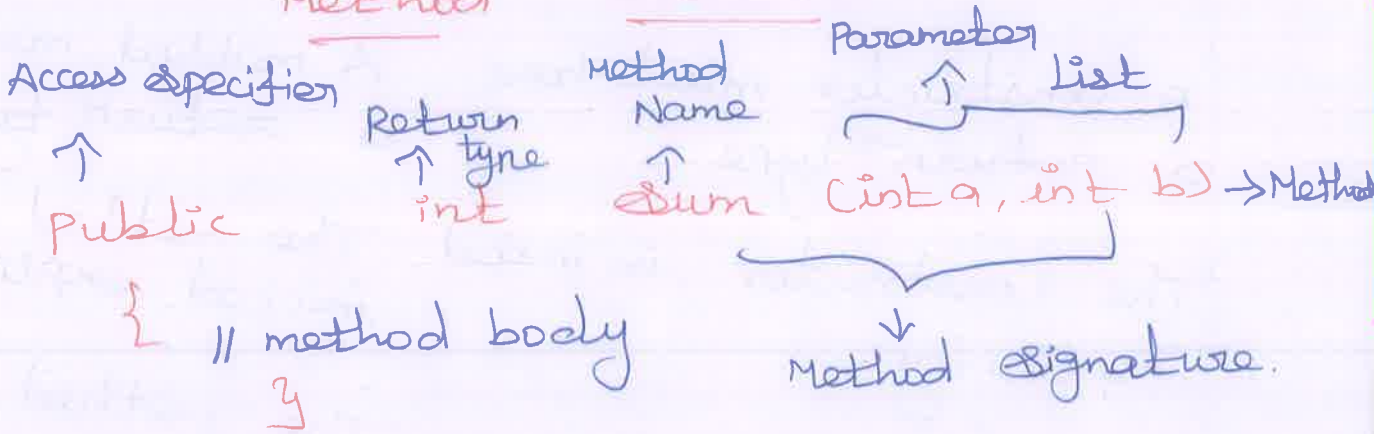
1.12 Methods

Methods are nothing but the functions defined by the particular class.

A method is a block of code which only runs when it is called. data passing known as parameters into a method. Methods are used to perform certain actions and they are also known as Functions.

It is used to achieve the reusability of code.

Method Declaration



Method Signature:

Every method has a method signature. It is a part of the method declaration.

It includes the method name & parameter list.

Access specifier:

Access specifier or modifier is the access type of the method. It specifies the visibility of the method. Java provides four types of access specifier: public, private, protected, default

Return Type:

Return type is a data type that the method returns.

It may have a primitive data type, object, collection, void, etc.

If the method does not return anything, we use void keyword.

Method Name:

It is the unique name that is used to define the name of a method. It must be corresponding to the Functionality of the method. A method is invoked by its name.

parameter List:

It is the list of parameters separated by a comma and enclosed is the pair of parentheses. It contains the data type and variable name. If the method has no parameter, left the parantheses blank.

Method body:

It is a part of the method declaration. It Contains all the actions to be performed. It is enclosed within the pair of curly braces.

Naming a Method.

The method name must start with a lowercase letter.

Single-word method name : sum(), area()

Multi-word method name : areaOfCircle()
stringComparision()

Types of Method:

There are two types of methods in java

→ predefined Method.
→ user defined Method.

predefined Method:

In java predefined methods are the method that is already defined in the java class libraries is known as predefined methods.

It is also known as the Standard lib method or built-in method.

predefined Method:

length(), equals(), CompareTo(), sqrt().

Each and every predefined method is defined inside a class. Ex: print() method is defined in the java.io.PrintStream class.

Ex:

```
public class Demo
{
public static void main (String[] args)
{
// using the max() method of Math class
System.out.print("The maximum number is:"
                 + Math.max(9,7));
}}
```

o/p
The maximum number is :9

User-defined Method

The method written by the user or Programmer is known as a user-defined method.

These methods are modified according to the requirement.

Ex: Checks the number is even or odd.

```
// user defined method
public static void findEvenodd (int num)
{
  // method body
  if (num % 2 == 0)
  System.out.println (num + " is even");
  else
  System.out.println (num + " is odd");
  }
```

How to call or Invoke a User

The calling of a method in a program is simple. when we call or invoke a user-defined method, the program control transfer to the called method.

Ex:

```
import java.util.Scanner;
Public class Evenodd
{
Public static void main (String args[])
{
  // Creating Scanner class obj
Scanner scan = new Scanner (System.in);
System.out.print ("Enter the number:");
  // reading value from the user
int num = scan.nextInt();
  // method calling
FindEvenodd (num);
}
```

1.13 Access specifiers

Java provides four types of access modifier or visibility specifiers.

(i.e) default
Private
public
protected

Private:

The Private access modifier is accessible only with in the class. It can't be accessed from outside the class.

Default: The access level of a default modifier is only within the package. It cannot be accessed from outside the package.

If you do not specify any access level, it will be the default.

Protected:

The access level of a protected modifier is within the package and outside the package through child class. If you do not make the child class, it cannot be accessed from outside the package.

public:

The access level of a public modifier is everywhere. It can be accessed from within the class, outside the class, within the package and outside the package.

1.14 Static Members

Static members are those which belongs to the class and you can access these members without instantiating the class.

The static keyword can be used with methods, fields, classes (inner/nested) blocks.

Static members → static data member
Static members → static method

The static members can be static data member (or) static method.

Static member:

The static members are those members which can be accessed without using object.

static method:

You can Create a static method by using the keyword static.

static methods can access only static fields, methods.

Ex:

```
public class Myclass
{
public static void sample ()
  {
System.out.println ("Hello");
}
public static void main (String args[])
{
  Myclass.sample();
}}
```

o/p
Hello

Static Fields

You can create a static field by using the keyword static.

The static fields have the same value in all the instances of the class.

These are created and initialized when the class is loaded for the first time.

O/P
00

Ex:

```
public class myclass
{
public static int data = 20;
public static void main(String args[])
{
System.out.println(myclass.data);
}
```

Java arrays with Ans 27

Static Blocks

These are a block of codes with a static keyword.

These are used to initialize the static members.

JVM executes static blocks before the main method at the time of class loading.

```
public class myclass
{
static
{
System.out.println ("Hello this is a static block");
}
public static void main (String args[])
{
System.out.println ("This is main method");
}}
```

O/P

Hello this is a static block
This is main method.

1.15 JavaDoc Comments

Java Comments are the statements that are not executed by the compiler and Interpreter. is a program

Types:

1. Single Line Comment
2. Multi Line Comment
3. Documentation Comment.

1. SLC: (// This is single line Comment)
The single line Comment is used to comment only one line.

2. MLC: (/* This is multi line Comment)
The multi Line Comment is used to Comment multiple lines of code.

Documentation:

The documentation Comment is used to create documentation API.

Documentation Comments are usually used to write large programs for a project coz b/w applⁿ as it helps to create documentation API.

These APIs are needed for reference, i.e., which classes, methods, arguments etc.,

To create documentation API, we need to use the javadoc tool.

The documentation comments are place b/w /** and */.

Syntax:

```
/**
 *
 * we can use various tags to depict the parameter.
 * or heading or author name
 * we can also use HTML tags
 *
 */
```

```
import java.io.*;
/**
* <h2> Calculation of numbers </h2>
* This pgm implements an applnc
* to perform operation such as
addition of numbers
 * and print the result.
 * @author Anurati
 * @version 1.0
 * @since 2021-07-06
 */
public class Calculate {
public int sum(int input1, int input2)
{
return input1 + input2;
}
public static void main (String args)
{
 Calculate obj = new Calculate();
  int result = obj.sum (40, 20);
System.out.println (" Addition of numbers"
                    + result);
}}
```

O/P

Addition of numbers : 60

Unit -1

Introduction to oop and Java

PART-A (2 Marks)

1. Explain what is object oriented Programming paradigm
2. List the features of oop.
3. Define objects and classes in Java.
4. what is the difference between object and class?
5. what is the difference between static and non static variables?
6. Define Encapsulation.
7. what is the difference between Data Encapsulation and Data abstraction.
8. Define polymorphism.
9. what is the difference between Inheritance and polymorphism.
10. List the application of oop.
11. List the features of java.
12. Draw the structure of java program.
13. Explain java token and list the type of tokens.
14. Define variables.

15. what are the various operators used in java.

16. Define Control statements

17. what are the Control statements in Java.

18. Define Array. List the types of Array.

19. Define Constructor.

20. Enumerate two situations in which static methods are used.

PART-B 16 Marks

1. Explain what is OOPs and explain features of OOPs. 8M

2. Discuss the following i) inheritance
ii) polymorphism 8M

3. Explain the various Features of java in detail. 5M

4. Explain the Java Buzzwords in delail 16M

5. Explain the types of Data types in java 16M

6. Explain briefly about Control statements with example program. 16M

7. what is Arrays and explain about the types of arrays. 16M

8. Define Constructor and write the properties of

9. what is method ? How method is defined ? Give example. 10 M

10. Write short note on access specifier in java. 6M

11. Discuss the working and meaning of the "static" modifier with suitable example. 8M

12. Write short notes on JavaDoc Comments.

U-II Inheritance, packages and Interfaces

2.1 overloading Methods

overloading is a mechanism in which we can use many methods having the same function name but Can pass different number of parameters or different types of parameter.

Ex:

```
int sum(int a, int b);
double sum(double a, double b);
int sum(int a, int b, int c);
```

Ex:

```
class Animal
{
void eat()
{
System.out.println("eating");
}
```

o/p

"eating"

If a class has multiple methods having same name but different in parameters, it is known as Method overloading.

Advantage

Method overloading increases the readability of the program.

Different ways to overload the method.

2 ways:

1. By changing number of arguments
2. By changing the data type.

1. Method overloading: changing no. of arguments

```
class adder
{
static int add (int a, int b)
{
return a+b;
}
static int add (int a, int b, int c)
{
return a+b+c;
} }
class testoverloading
{
public static void main(String[] args)
{
System.out.println(adder.add(11,11));
```

O/P

22

24.0

33

```
System.out.println(Addder.add(11,11,11));
}}
```

2) Method overloading: changing data type of arguments.

we have to created two methods that differs in data type.

```
class Addder
{
static int add(int a,int b)
{
return a+b;
}
static double add(double a, double b)
{
return a+b;
}}
class TestOverloading
{
public static void main(String[] args)
{
System.out.println(Addder.add(11,11));
System.out.println(Addder.add(12.3,12.6));
}}
```

o/p

22

24.9

2.2 objects as parameters

The object can be passed to a method as an argument.

Using dot operator the object's value can be accessed.

Syntax:

```
Data type  name of method (object_name)
{
  // body of method
}
```

Ex:

```
public class objDemo
{
int height;
int width;
objDemo (int h, int w)
{
 height = h;
 width = w;
}
void area (objDemo o)
{
int result = (height + o.height) *
             (width + o.width);
System.out.println ("The area is" + result);
}}
```

O/P

```
javac objDemo.java
java Demo
The area is 27b.
```

```
class Demo
{
public static void main(String args[])
{
objDemo obj1 = new objDemo(2,3);
objDemo obj2 = new objDemo(10,20);
obj1.area(obj2);
}}
```

2.3 Returning objects

We can return an object from a method. The data type of such method is a class type.

Ex:

```
public class objRetDemo
{
int a;
objRetDemo(int val)
{
a=val;
}
objRetDemo fun()
{
objRetDemo temp = new objRetDemo(a+5);
return temp;
}}
class objRet
{
```

```
public static void main (String args[])
{
  objRetDemo obj2 = new objRetDemo(20);
  ObjRetDemo obj1;
  obj1 = obj2.fun();
 System.out.println("The returned value
   is = " +obj1.a);
    }
}
```

o/p

```
javac objRetDemo.java
java objRet
```

The returned value is = 25.

2.4 static, Nested and inner classes

Inner classes are the nested classes. The classes that are defined inside the other classes.

Syntax:

```
Access modifier class Outerclass
{
 // code
 Access-modifier class Innerclass
 {
  // code
  }
}
```

Types of Inner class:

1. static Member class
2. Member classes
3. Local classes
4. Anonymous classes.

1. Static Member classes

This inner class is defined as the static member variable of another class.

static members of the outer class are visible to the static inner class.

The non-static members of the outer class are not available to inner class.

Syntax:

```
Access-modifier class OuterClass
{ //code
  public static class InnerClass
  {
  //code
  } }
```

2. Member classes

This type of inner class is non static member of outer class.

3. Local classes

This class is defined within a java code just like a local variable.

Local classes are never declared with an access specifier.

The scope inner classes is always restricted to the block in which they are declared.

Syntax:

```
Access_modifier class outerclass
{
  //code
  Access_modifier returntype methodname (arguments)
  {
    class Innerclass
    {
      //code
    }
    //code
  }
}
```

4. Anonymous classes

Anonymous class is a local class without any name.

Anonymous class is a one-shot class created exactly where needed.

The anonymous class is created in following situations.

when the class has very short period. Only one instance of the class is needed.
class is used immediately after defining it.

The anonymous inner class can extend the class it can implement the interface or it can be declared in method argument.

2.5 Inheritance Basics

Inheritance is a mechanism in Java by which derived class can borrow the properties of base class and at the same time the derived class may have some additional properties.

Advantages:

Inheritance is to minimize the amount of duplicate code in an application by sharing Common code amongst several subclasses.

1. Reusability 2. Extensibility
3. Data Hiding 4. overriding

Concept of Base and Derived class

The inheritance is a mechanism is which the child class is derived from

a parent class.

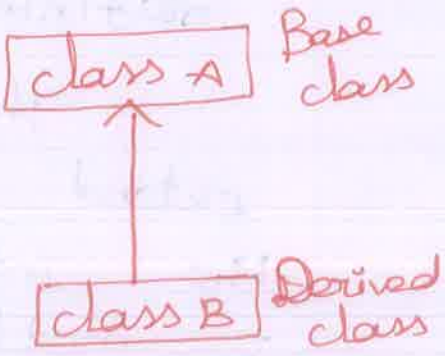
The derivation is using the keyword extends.

The parent class is called base class.

The child class is called derived class.

Ex:

```
class A  ← Base class
{
  ...
}
class B extends A
{
  ...   ← Derived class
}
```



Types of Inheritance:

1. Single Inheritance
2. Multiple Inheritance
3. Multilevel Inheritance
4. Hybrid Inheritance.

Implementation of Different Types of Inheritance.

Single Inheritance:

The class which is inherited is called the base class (or) super class.

The class that does the inheriting is called the derived class or the subclass.

The subclass can be defined as follows.

```
class name of subclass extends superclass
{
  Variable declarations
  Method declarations
}
```

Ex:

```
class A
{ int a;
  void set_a (int i)
  {
    a = i;
  }
  void show_a()
{ System.out.println("The value of a = " +a);
  } }
class B extends A
{ int b;
  void set_b(int i)
  { b = i;
  }
  void show_b()
{ System.out.println("The value of b=" +b);
}
void mul()
```

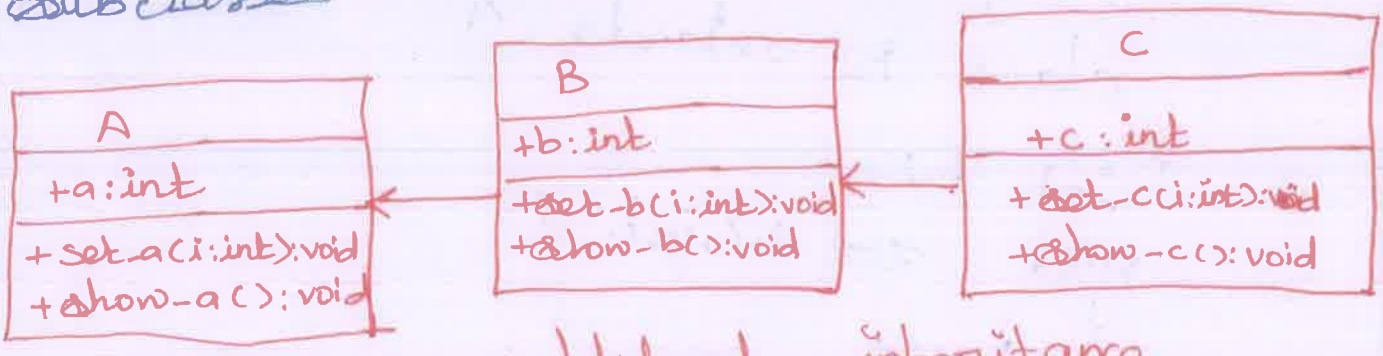
```
    int c;
    c=a*b;
    System.out.println("The value of c="+c);
    }}
class InheritDemo1
{
public static void main(String args[])
{
    A obj_A = new A();
    B obj_B = new B();
    obj_B.set_a(10);
    obj_B.set_b(20);
    obj_B.show_a();
    obj_B.show_b();
    obj_B.mul();  }}
```

O/P

```
javac InheritDemo1.java
java InheritDemo1
The value of a=10
The value of b=20
The value of c=200
```

Multilevel inheritance:

The multilevel inheritance is a kind of inheritance in which the derived class itself derives the subclasses further.



Multilevel inheritance.

Ex:

```
class A
{
int a;
void set_a(int i)
{ a=i; }
```

```
  void show-a()
{
System.out.println("The value of a=" +a);
 }
class B extends A
{int b;
void set-b(int i)
{b=i;
 }
void show-b()
{System.out.println("The value of b=" +b);
 }}
class C extends B
{int c;
void set-c(int i)
{ c=i;
 }
void show-c()
{
System.out.println("The value of c=" +c);
 }
void mul()
{
int ans;
ans = a*b* c;
System.out.println("The value of ans=" +ans);
 }}
class MultiLvlInherit
{
public static void main(String args[])
```

```
{
A obj-A = new A();
B obj-B = new B();
c obj-c = new c();
obj.c.set_a(10);
obj.c.set_b(20);
obj.c.set_c(30);
obj-c.show-a();
obj.c.show-b();
obj.c.show-c();
obj-c.mul();
}}
```

o/p

The value of a = 10
The value of b = 20
The value of c = 30
The value of ans = 6000

super keyword

super is a keyword used to access the immediate parent class from subclass → There are 3 ways by which the keyword super is used.

1. variable invocation 2. Method Invocation
3. Constructor Invocation

1. The super() is used to invoke the class method of immediate parent class

```
class A
{
 int x=10;
}
class B extends A
{ int x=20;
```

```
void display()
{
System.out.println(super.x);
}
public static void main(String args[])
{
  B obj = new B();
  obj.display()
}}
```

output
10

2. The super() is used to access the class variable of immediate parent class.

```
class A
{
void fun()
{
System.out.println("Method : class A");
}}
class B extends A
{
void fun()
{
System.out.println("Method : class B");
}
void display()
{super.fun();
}
public static void main(String args[])
{ B obj = new B();
  obj.display();
}}
```

output
Method : class A.

3. The super() is used to invoke the immediate parent class constructor.

```
class A
{
A()
{System.out.println("Constructor of class A");
}}
class B extends A
{
B()
{ super();
System.out.println("Constructor of class B");
}
public static void main(String args[])
{
  B obj = new B();
 }
```

output

Constructor of class A
Constructor of class B

Method overriding

Method overriding is a mechanism in which a subclass inherits the methods of superclass and sometimes the subclass modifies the implementation of a method defined in superclass.

The overriden method must be called from the subclass.

```
class A
{
int a=0;
void fun(int i)
  { this.a=i; }
```

```
}
class B extends A
{ int b;
void fun (int i)
{
 int c;
 b=20;
super.fun(i+5);
System.out.println("value of a:" +a);
System.out.println("value of b:" +b);
 c=a*b;
System.out.println("The value of c=" +c);
  }}
class overridedemo
{
public static void main(String args[])
{ B obj-B =new B();
  obj-B.fun(10); }}
```

output

```
javac overridedemo.java
java overridedemo
value of a:15
value of b:20
The value of c=300.
```

Method overloading

The Method overloading occurs at Compile time

The overloaded functions may have different return types.

Method overloading is performed with in a class

Method overriding

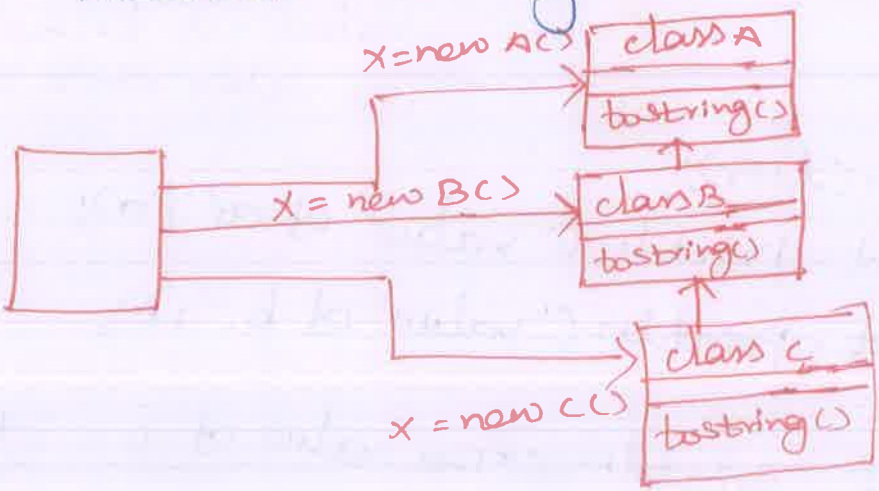
The method overriding occurs at the run time or execution time

In method overriding all the methods will have the same return type.

Method overriding is normally performed b/w two classes that have relationship inheritance

Polymorphism

Polymorphism is a mechanism which allows to have many forms of the method having the same name.



Polymorphism

```
class A extends object
{ public string tostring()
  { return "A";
  }
class B extends A
{ public string tostring()
  { return "B";
  }
class C extends B
{ public string tostring()
  {
   return "C";
  } }
```

```
public class PolymorphismDemo
{
public static void main(String[] args)
{
fun(new C());
fun(new B());
fun(new A());
}
public static void fun(Object x)
{
System.out.println(x.toString());
}}
```

output

```
javac PolymorphismDemo.java
java PolymorphismDemo
C
B
A
```

Dynamic Method Dispatch

The dynamic method dispatch is also called at runtime polymorphism. During the run time Polymorphism a call to overriden method is resolved at runtime.

Ex:

```
class Base
{
void display()
{
System.out.println("In Base Method called");
}
class Derived extends Base
{
void display()
{
System.out.println("Derived Method call");
```

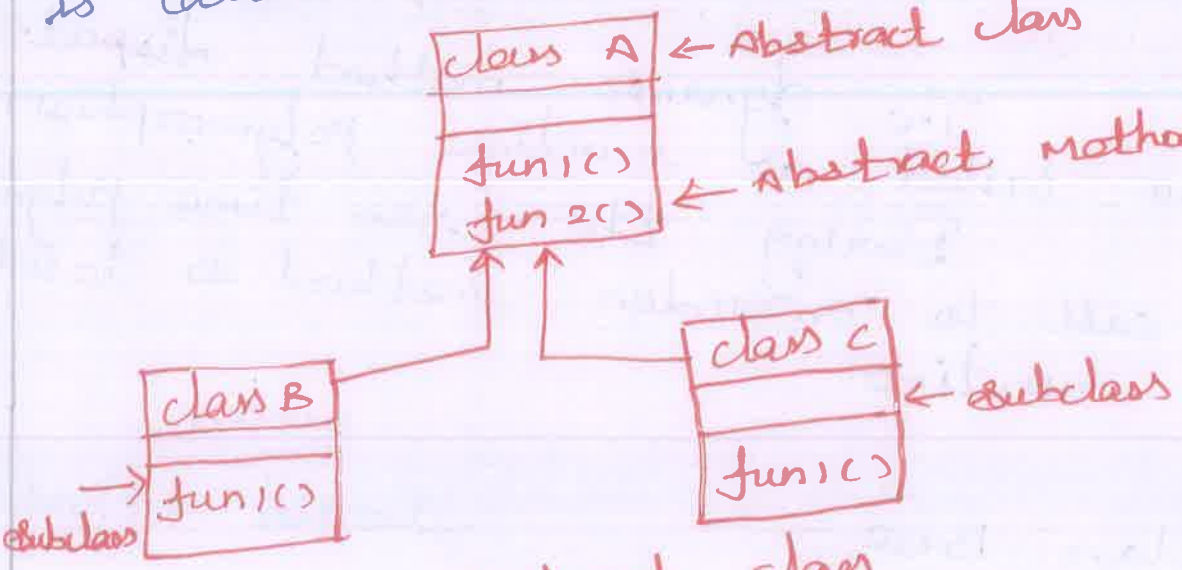
output

Derived Method called

```
public class RunpolyDemo
{
  public static void main(String args[])
  {
  Base obj = new Derived();
   obj.display();
    }}
```

Abstract classes

This class does nothing but only specifies the member functions that can be used in hierarchy. Such a class is called abstract class.



Abstract class

An abstract method must be present in an abstract class only. It should not be present in a non-abstract class.

Abstract class cannot be instantiated using the new operator

A constructor of an abstract class can be defined and can be invoked by the subclasses.

```
abstract class A
{
abstract void fun1();
void fun2()
{
System.out.println("A: In fun2");
}}
class B extends A
{void fun1()
{
System.out.println("B: In fun1");
}}
class C extends A
{
void fun1()
{
System.out.println("C: In fun1");
}}
public class AbstractClsDemo
{
public static void main(String[] args)
{
B b = new B();
C c = new C();
b.fun1();
b.fun2();
c.fun1();
c.fun2();
}}
```

O/P

```
javac AbstractClsDemo.java
java AbstractClsDemo

B: In fun1
A: In fun2
C: In fun1
A: In fun2
```

The Final with Inheritance

The final keyword can be applied at three places

1. For declaring variables
2. For declaring the methods
3. For declaring the class

Final variables and Methods

A variable can be declared as final. If a particular variable is declared as final then it cannot be modified further.

The final variable is always a Constant.

Ex: final int a=10;

The method those are declared with the keyword final cannot be overridden.

```
class Test
{
 final void fun()
{
System.out.println("\n Hello. this function declared using final");
}}
class Test1 extends Test
{ final void fun()
{System.out.println("\n Hello. this another function");
}}
```

O/P

```
javac Test.java
Test.java:10: fun() in Test1 cannot override fun() in Test; overriden method is final
final void fun()
^
1 error
```

Final classes to stop Inheritance

If we declare particular class as final, no class can be derived from it.

```
final class Test
{
void fun()
{System.out.println("In Hello, this function is in base class");
}}
class Test1 extends Test
{
final void fun()
{System.out.println("In Hello, this another function");
}}
```

output

```
javac Test.java
Test.java:8 : Cannot inherit from final Test
class Test1 extends Test
      ^ error
```

The finalize() method

Inside the finalize() method you will specify those actions that must be performed before an object is destroyed.

To add finalizer to a class simply define the finalize method.

Syntax:

```
void finalize()
{
finalization code
}
```

finalize() method is called just before the garbage collection. It is not called when an object goes out of scope.

The purpose of finalization is to perform some action before the objects get cleaned up.

The cleanup code can be kept in the finalize method block.

Packages

package is a mechanism in which variety of classes and interfaces can be grouped together.

Purpose: Packages are used to achive the code reusability.

Syntax:

package name-of-package;

Ex: package My-package;

Creating and Accessing package

Step 1: create a folder named My-package.

step 2: Create one class which contains two methods. We will store this class in a file named A.java.

This file will be stored in a folder my-package.

```
package mypackage;
{
public class A
{
int a;
public void set_val (int n)
{
a=n;
}
public void display()
{
System.out.println("The value of a is" +a);
}}
```

Step 3: The source file is also stored in the subdirectory my-package.

```
import my package A;
class packageDemo
{
...}
```

Step 4: open the command prompt and issue the following commands inorder to run the package programs.

D:\> set CLASSPATH =;D:\; setting the class path

D:\> cd My_package

D:\My_package > javac A.java creating the class A.class an

D:\My_package > javac package Demo.java Demo.class

files.

CLASSPATH

The packages are nothing but the directories.

specify the directory path setting the classpath statement.

Importing package

All the standard classes in java are stored in named packages.

The import statement can be written at the beginning of the java program. using the keyword import.

There are 2 ways of accessing the classes stored in the core package.

1. import java.util.Date;
2. import java.util.*

Interfaces

Syntax:

```
access-modifier Interface name-of-Interface
{
return-type method name1 (parameter1, parameter2...
                                    parameter n);
....
return-type method name1 (parameter1, parameter2,...);
type static final variable-name = value;
}
```

The interface is denoted by a keyword interface.

The interfaces may contain data members & method.

The interface makes use of only public access specifier. The members of interfaces are always declared as final.

The interface in java is a mechanism to achieve abstraction & multiple inheritance is java

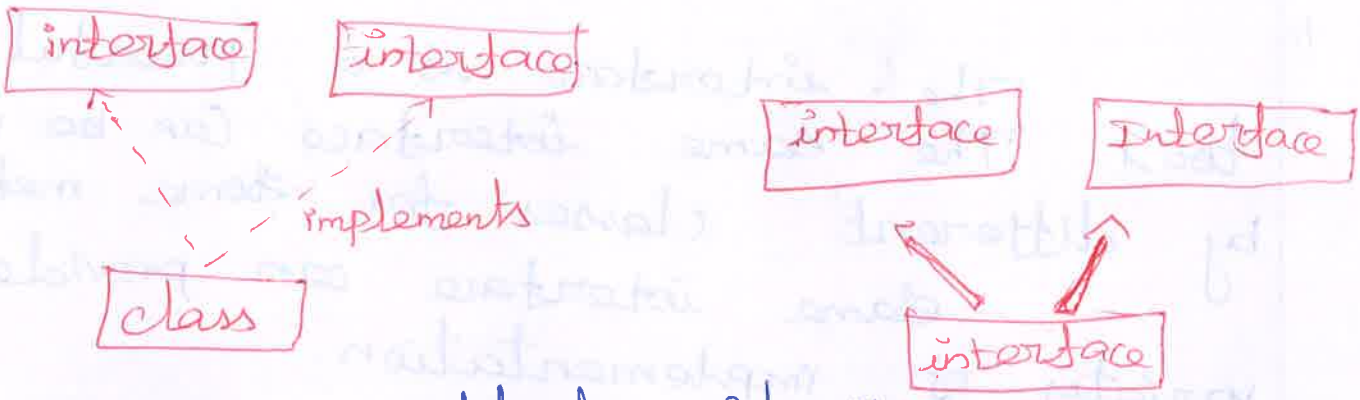
It can be used to achieve loose coupling.

```
interface Drawable
{
void draw();
}
class Rectangle implements Drawable
{
public void draw()
{
System.out.println("drawing rectangle");
}
class Circle implements Drawable
{
public void draw()
{
System.out.println("drawing circle");
}
class TestInterface1
{
public static void main(String args[])
{
Drawable d = new Circle();
d.draw();
}}
```

The drawable interface has only one method. Its implementation is provided by Rectangle and circle classes.

Multiple inheritance in java by Interface

If a class implements multiple interfaces or an interface extends multiple interfaces.



multiple inheritance in java

```
interface printable
{
void print();
}
interface showable
{
void show();
}
class A7 implements printable, showable
{
public void print()
{
System.out.println("Hello");
}
public void show()
{
System.out.println("welcome");
}
```

```
public static void main (String args[])
{
  A7 obj = new A7();
  obj.print();
  obj.show();
}
}
```

The interface is a powerful tool. The same interface can be used by different classes for same method. same interface can provide variety of implementation.

Unit-2

Inheritence, packages & Interfaces ①

PART-A (2 Marks)

1. Define the term inheritance.
2. Enlist various forms of inheritance.
3. what is the purpose of final keyword?
4. Distinguish between static and dynamic binding.
5. Define inheritance hierarchy.
6. Can an abstract class be final? why?
7. Can an abstract class in java be instantiated? Give the reason.
8. State the condition for method overriding in java.
9. Mention the necessity for import statement
10. write the syntax for importing packages in a java source file and given an example.
11. what is interface mention its use.
12. Define interface and write the syntax of the interface.
13. what is static inner class?
14. List the types of inheritance.
15. Distinguish between the Method overloading and overriding.

16. write short note on final keyword.

17. what is meant by package?

PART-B (16 MARKS)

1. Discuss in detail about inner class with its usefulness. 8M

2. Explain in detail about various types of inheritance in java with neat diagram. 16M

3. Describe the usage of super keyword. 8M

4. Differentiate between method overloading and Method overriding. Explain both with an example. 16M

5. Describe the Dynamic method Dispatch 8M

6. what is an abstract class? illustrate with an example to demonstrate abstract class. 16M

7. Write a note on final keyword. 8M

8. state the purpose of finalize() method in java. 6M

9. with suitable examples explain how Packages can be created, imported and used.

10. what is an interface? write a java program to illustrate the use of interface. 8M

UNIT-3

Exception Handling and MultiThreading

3.1 Exception Handling basics:

Exception Handling is a mechanism to handle runtime errors such as IO Exception, SQL Exception etc, so that the normal flow of the application can be maintained.

Exception is an abnormal Condition.

Advantage:

The core advantage of exception handling is to maintain the normal flow of the application.

Major reasons why an exception occurs

- -> Invalid user input
- -> Device failure
- -> Loss of n/w Connection
- -> physical limitations (out of disk memory)
- -> code errors
- -> opening an unavailable file

3. Types of Exception

Java defines several types of exceptions that relate to its various class libraries.

Java also allows user to define their own exceptions.

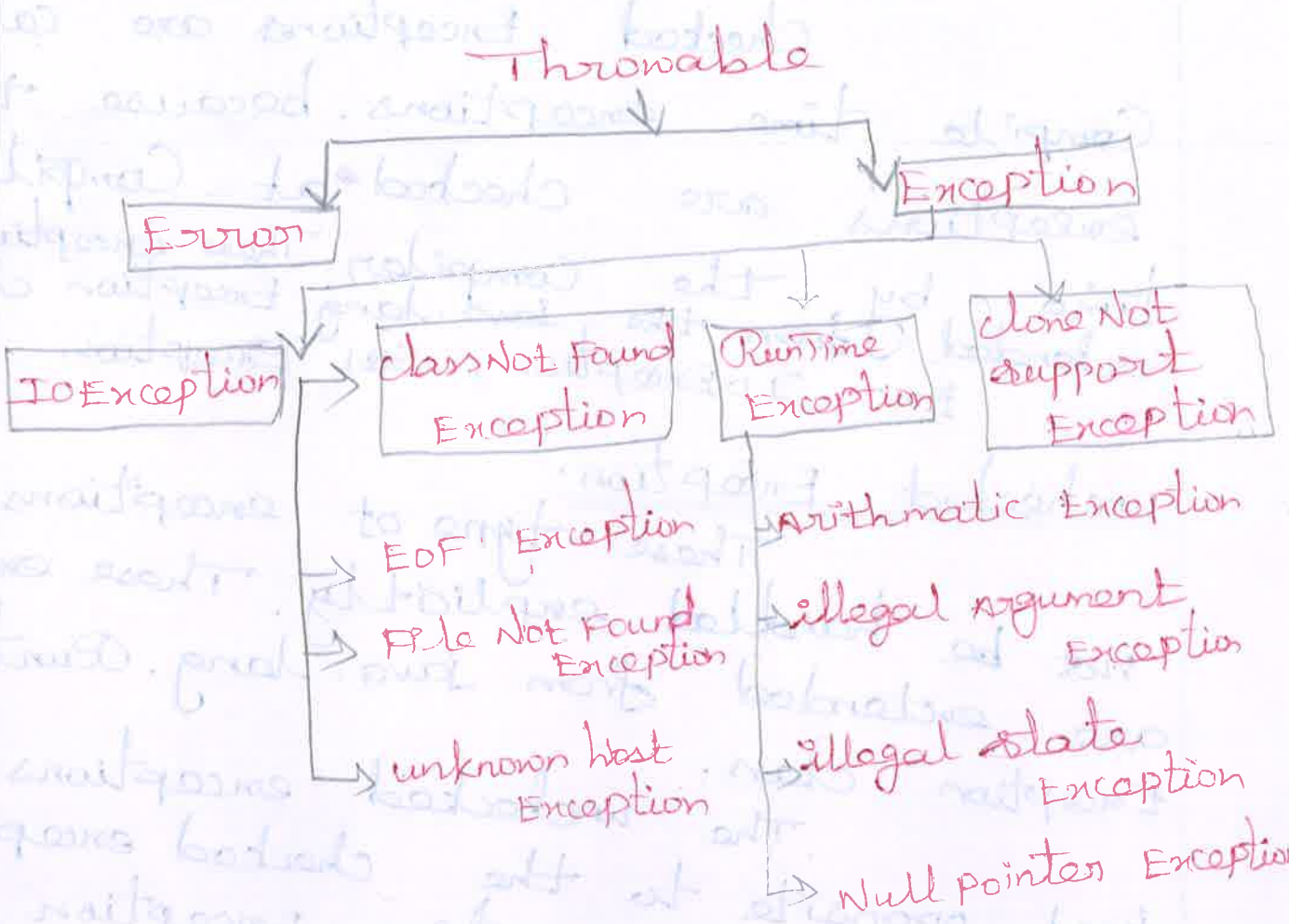
Types of Exception

- user defined Exception
- Built in Exception
  - checked Exception
    - ClassNotFound Exception
    - IO Exception
    - SQL Exception
    - FileNotFound Exception
  - unchecked Exception
    - Arithmetic Exception
    - Null pointer Exception
    - ArrayStore Exception

Exception Handling

- checked Exception
- unchecked Exception
- Errors

Exception Hierarchy



Exception Can be categorized in two ways

→ Built-in-Exception
1. checked Exception
2. unchecked Exception

→ User defined Exception

Built-in-Exception

Built-in-Exception are the exceptions that are available in java libraries.

Checked Exception:

Checked Exceptions are called Compile time exceptions. because these exceptions are checked at Compile time by the Compiler. These exceptions are extended from the java.lang.Exception class.

Ex: IOException, SQL Exception.

unchecked Exception:

These type of exceptions need not be handled explicitly. These exceptions are extended from java.lang.Runtime Exception class.

The unchecked exceptions are just opposite to the checked exceptions. It is called Runtime Exception.

User defined Exception

Sometimes, the built-in exceptions in java are not able to describe a certain situation. In such cases, user can also create exceptions, which are called user defined Exceptions.

Keywords used in Exception Handling.

1. Try 2. Catch 3. Finally
4. throw 5. throws

Try:

The "try" keyword is used to specify a block where we should place an exception code. The try block must be followed by either catch or finally.

Catch:

The "catch" block is used to handle the exception. It must be preceded by try block, which means we can't use catch block alone.

Finally:

The finally block is used to execute the necessary code of the program. It is executed whether an exception is handled or not.

Throw:

The "throw" keyword is used to throw an exception.

Throws:

The "throws" keyword is used to declare exceptions. It specifies that there may occur an exception in the method.

3.1 Exception Handling Example

```
public class JavaExceptionEx
{
public static void main (String args[])
{
try
{
int data = 100/0;
}
catch (ArithmeticException e)
{
System.out.println(e);
}
System.out.println("rest of code");
}}
```

O/P

Exception in thread main java.lang.
ArithmeticException / by zero
rest of code..

Try - Catch block

Java try block

Java try block is used to enclose the code that might throw an exception. It must be used within the method.

If an exception occurs at the particular statement in the try block

the rest of the block code will not execute.

Syntax:

```
try
{
// code that may throw an exception
}
catch(Exception class name ref)
{ }
```

Java Catch block

Java catch block is used to handle the Exception by declaring the type of exception within the parameter. The catch block must be used after the try block only.

Ex:

```
Public class TryCatchEx
{
Public static void main(String[] args)
{
try{int data =50/0;
}
Catch (ArithmeticException e)
{
System.out.println(e);
}
System.out.println("rest of code");
}
```

O/P

Java.lang.ArithmeticException/by zero

rest of the code

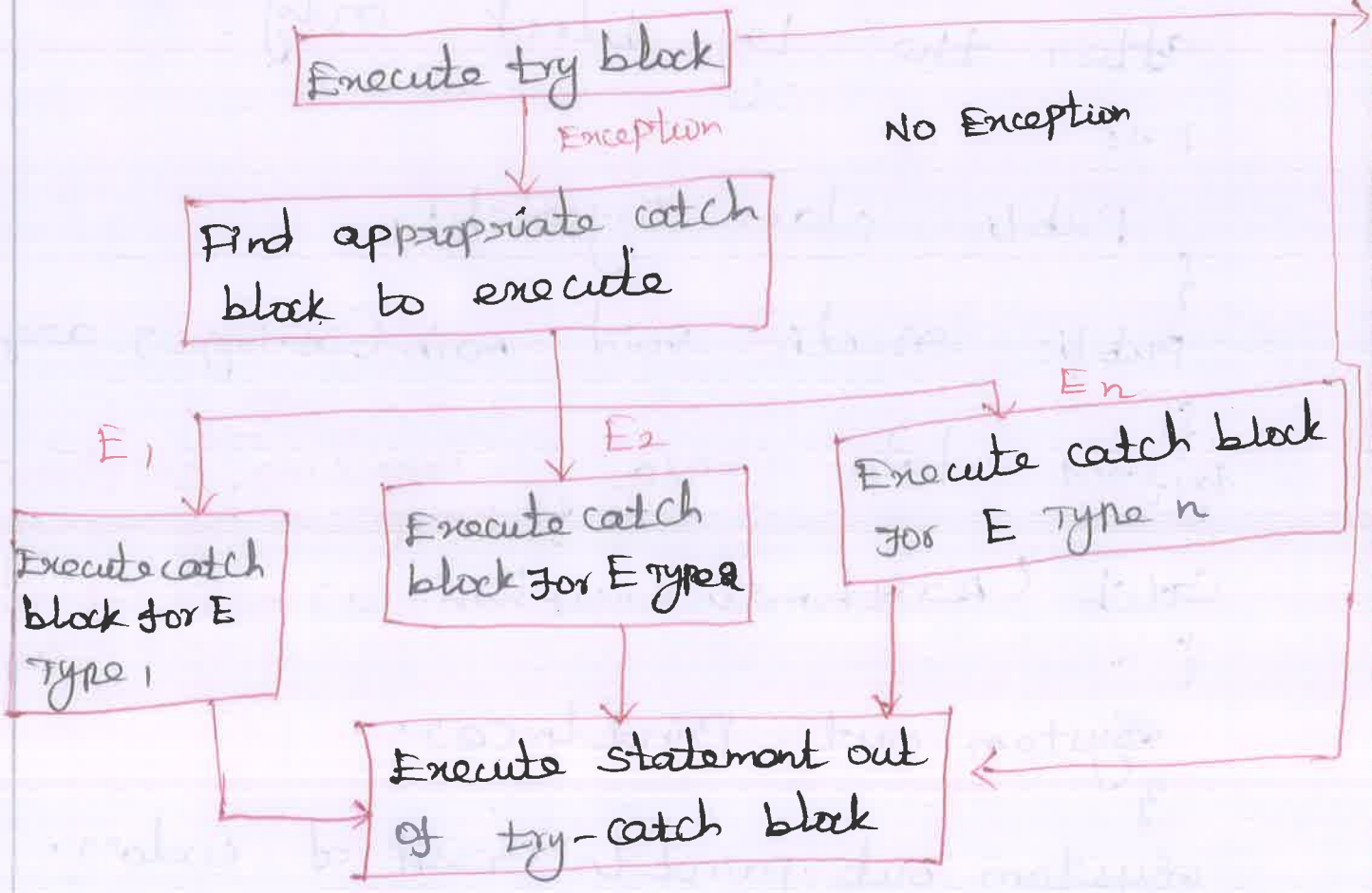
3.2 Multiple catch clauses

A try block can be followed by one or more catch blocks. Each catch block must contain a different exception handler.

→ At a time only one exception occurs and at a time only one catch block is executed.

→ All catch blocks must be ordered from most specific to most general. i.e. catch for Arithmetic Exception must come before catch for Exception

Flowchart of Multi-catch block



Ex:

```
public class Multiple catch block
{
public static void main (String[] args)
{
try
{
int a[] = new int[5];
   a[5] = 30/0;
 }
catch (ArithmeticException e)
{
System.out.println ("Arithmetic Exception
                     occurs");
 }
Catch (Array Indexout of Bounds Exception e)
{
System.out.println (" Array Index out of
                     Bounds Exception");

 }
catch (Exception e)
{
System.out.println (" parent Exception
                     occurs");
 }
System.out.println (" rest of the
                     code");
 } }
```

o/p

Arithmetic Exception occurs
rest of the code

3.3 Nested try statements

In java, using a try block inside another try block is permitted. It is called as nested try block.

why use nested try block:

Sometimes a situation may arise where a part of a block may cause one error and the entire block itself may cause another error. In such cases, exception handlers have to be nested.

Syntax:

```
try
{
statement 1;
statement 2;
try
{statement 3;
statement 4;
try
{ statement 5;
 statement 6;
 }
catch (Exception e2)
{
//exception message
```

```
  }
  catch (Exception e1)
{
//exception message
  }
  }
catch (Exception e3)
{
//exception message
}
```

Ex: NestedTryBlock.java

```
Public class NestedTryBlock
{
public static void main (String args[])
{
// outer try block
try {
try {
System.out.println("going to divide by 0");
  int b = 39/0;
  }
catch (ArithmeticException e)
{
System.out.println(e);
  }
try
{ int a[] = new int[5];
  a[5] = 4;
```

```
catch (ArrayIndexOutOfBoundsException e)
{
System.out.println(e);
}
System.out.println("other statements");
}
catch (Exception e)
{
System.out.println("handled the exception");
}
System.out.println("normal flow..");
}}
```

output

```
javac NestedTryBlock.java
java NestedTryBlock
going to divide by 0
java.lang.ArithmeticException: / by zero
java.lang.ArrayIndexOutOfBoundException: Index 5 out of bounds for
other statement.
normal flow..
```

3.4 Java's Built in Exceptions

ArithmeticException

This is caused by error in Math operations. (eg) Divide by zero.

Null pointer Exception

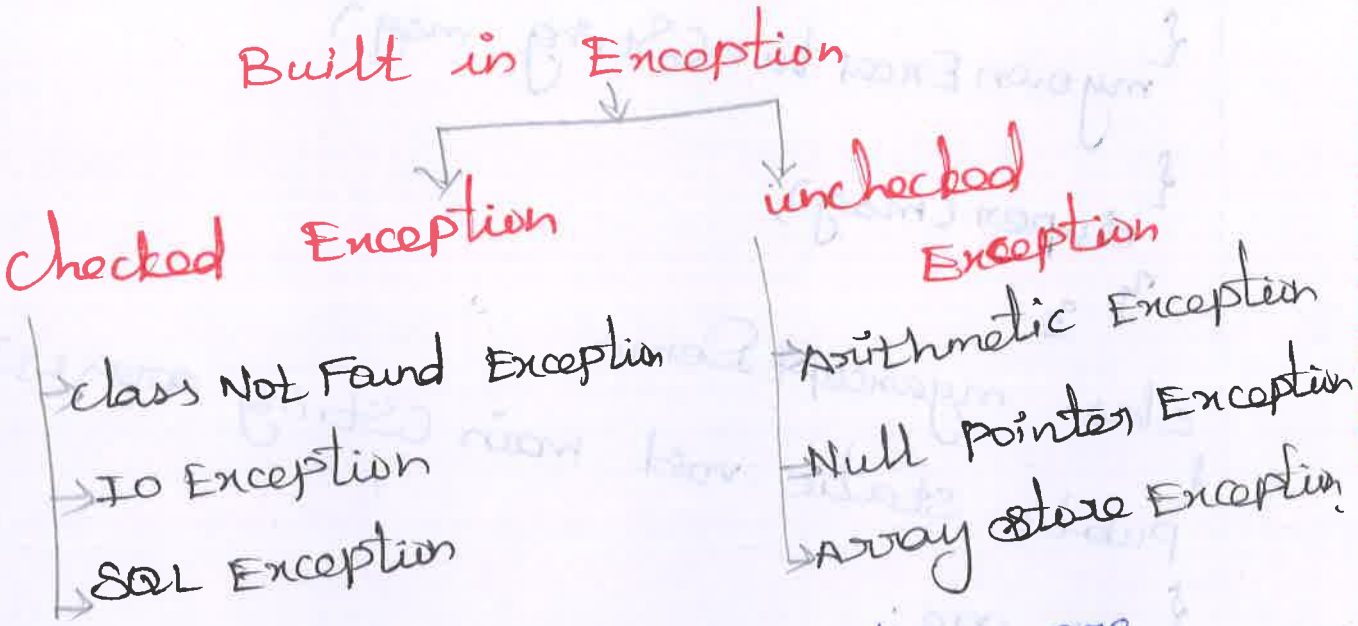
Caused when an attempt to access an object with a Null reference is made.

IO Exception

when an illegal i/o operation is performed then this exception is raised.

Array Indexout of Bound Exception

Array index when gets out of bound, this exception will caused.



Built-in exceptions are suitable to explain certain error situations.

3.5 User defined Exception

we can throw our own exceptions using the keyword throw.

syntax:

throw new Throwable's subclass.

→Throwable's subclass is actually a subclass derived from the Exception class.

Ex:

```
throw new ArithmeticException();
```

```
import java.lang.Exception;
class myownException extends Exception
{
myownException(String msg)
{
super(msg);
} }
class myexceptDemo
{
public static void main(String args[])
{
int age;
age=15;
try
{
if(age<21)
throw new myownException("your age very less than
                          the condition");
}
catch(myownException e)
{
System.out.println("This is my Exception
                    block");
System.out.println(e.getmessage()); }}
```

```
finally
{
System.out.println(" Finally block End of the
                    program ");
}}}
```

o/p

This is My Exception block
Your age is very loss then the condition
Finally block End of the program.

3.b Multi Threaded Programming

One of the exciting feature of windows OS is that - It allows the user to handle multiple tasks together.

This facility in windows Os is called multitasking.

In Java we can write the programs that perform multitasking using the multithreading Concept.

Definition of Thread:

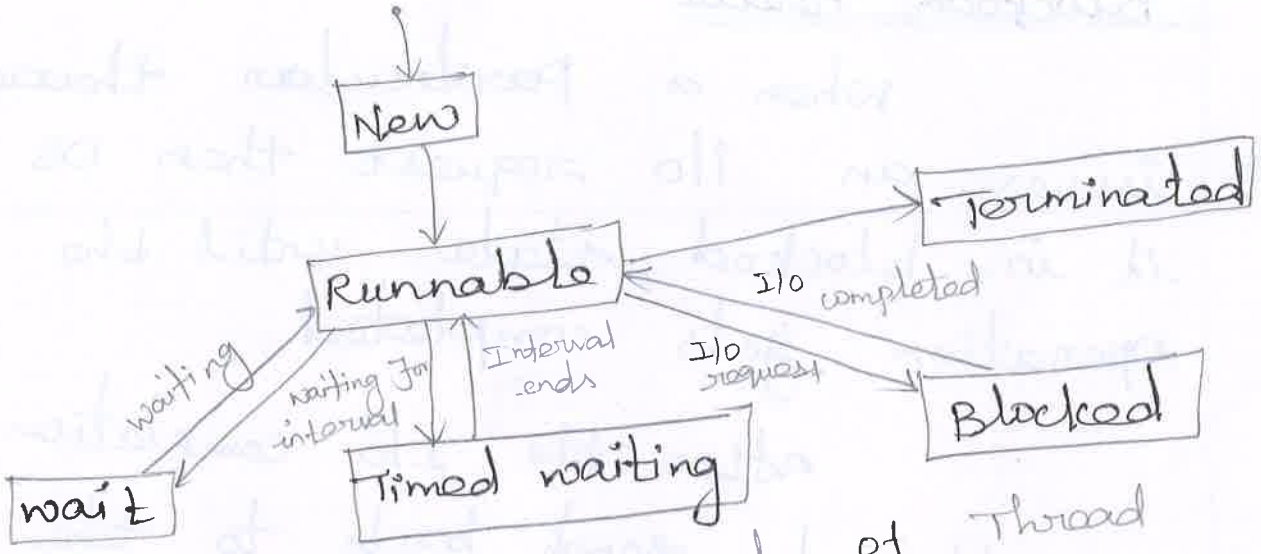
Thread is a tiny program running Continuously. It is sometimes called as light-weight process.

Thread	Process
Thread is a light weight process.	Process is heavy weight process.
Threads do not require separate address space for its execution.	Each process requires separate address space to execute.

Multithreading	Multiprocessing
Thread is a fundamental unit of multithreading	Program or process is a fundamental unit of multiprocessing environment.
It is highly efficient	It is less efficient in comparison with multithreading.
It helps in developing efficient application programs.	It helps in developing efficient os programs.

Java Thread Model

Thread is life cycle specifies how a thread gets processed in the java program.



Life cycle of Thread

New state:

When a thread starts its life cycle it enters in the new state.

Runnable state:

This is a state in which a thread starts executing.

Runnable

wait | Timed waiting | Blocked

Timed waiting state

To keep a particular threading waiting for some time interval.

This allows to execute high prioritized threads first.

After the timing gets over, the thread in waiting state enters in runnable state.

Blocked state

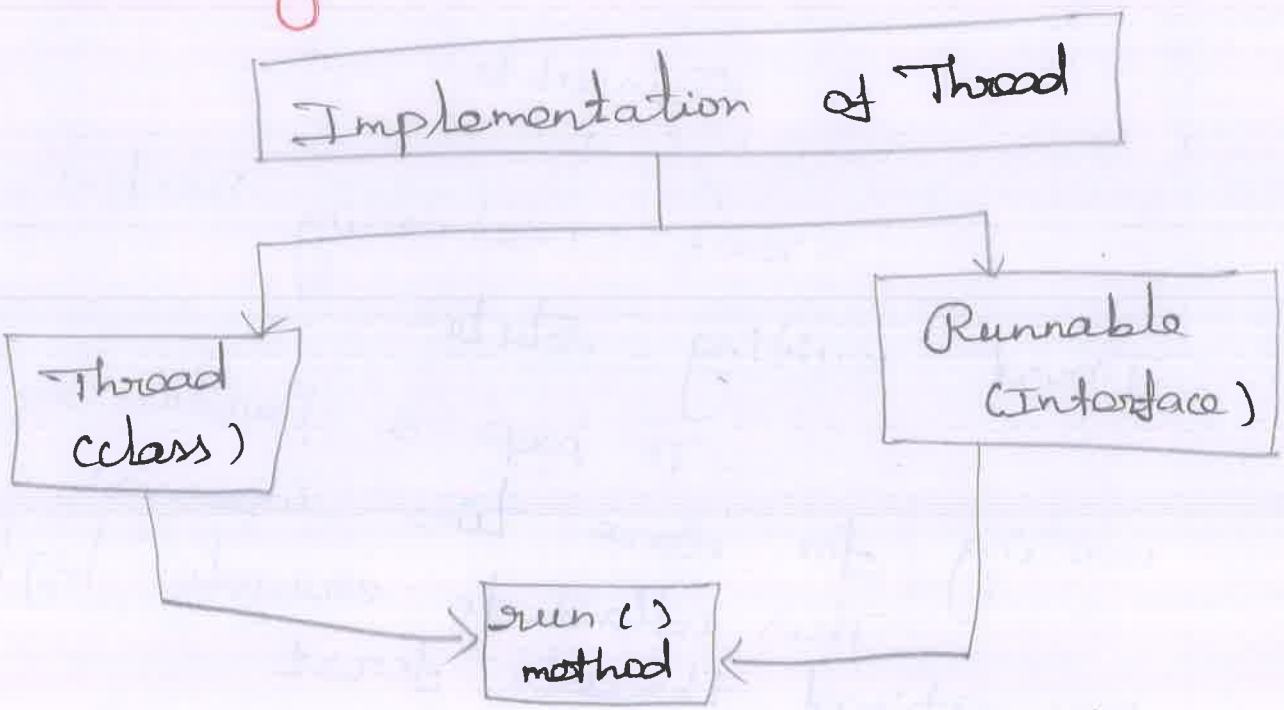
when a particular thread issues an i/o request then OS sends it in blocked state until the I/O operation gets completed.

After the I/O completion the the thread send back to the runnable state.

Terminated state:

After successful Completion of the execution the thread in runnable state enters the terminated state.

Creating a Thread



Creation of Java Thread.

In Java we can implement the thread programs using 2 approaches

1. Thread class (Extend)
2. Runnable Interface (Implement)

Threading is a facility to allow multiple task to run Concurrently within a single process.

Thread class

Thread class provide Constructors & methods to create and perform operations on a thread.

Thread class extends object class and implements Runnable interface.

The run() method is most important method in any threading program. By using this method the thread's behaviour can be implemented.

Commonly used Constructors of Thread class:

- Thread()
- Thread(String name)
- Thread(Runnable r)
- Thread(Runnable r, String name)

Commonly used methods of Thread class

Public void run()
Public void start()
Public void sleep(long milliseconds)
Public int set priority(int priority)
Public String get Name()

Naming Thread

The Thread class provides methods to change and get the name of a thread
By default each thread has a name (i.e) thread 0, thread 1...

public String getName() is used to return the name of a thread.
public void setName(String name) is used to change the name of a thread.

Extending thread

The first way to create a threads is to create a new class that extends Thread and then to create an instance of that class.
The extending class must override the run() method.
It must also call start() to begin execution of the new thread.

```
class Mythread extends Thread
{
public void run()
{
System.out.println("Thread is created");
}}
class Threadprog
{
public static void main(String args[])
{Mythread t = new Mythread();
t.start()
}}
```

O/P

```
javac Mythread.java
java Threadprog
Thread is created.
```

Implementing Runnable

The easiest way to create a thread is to create a class that implements the Runnable interface.

Runnable abstracts a unit of executable code. we can construct a thread on any object that implements Runnable.

To implement Runnable, a class need only implement a single method called run().

```
public void run()
```

After the new thread is created, it will not start running until we call its start() method.
which is declared within Thread.
start() erectes a call to run().

```
void start()
```

```
class MyThread implements Runnable
{
public void run()
{
System.out.println("Thread is created");
}}
class Threadprogram
{
public static void main(String args[])
{
MyThread obj = new MyThread();
Thread t = new Thread(obj);
t.start();
}}
```

o/p

```
javac Threadprogram.java
java Threadprogram
Thread is created
```

Creating Multiple Threads

Create a Bank Database applⁿ program to illustrate the use of multithreads.

```
public class BankAppln implements Runnable
{
private Account acc = new Account();
public static void main(String [] args)
{
BankAppl obj = new BankApp();
        Thread t1 = new Thread(obj);
        Thread t2 = new Thread(obj);
        Thread t3 = new Thread(obj);
          t1.setName("Mr.XYZ");
          t2.setName("Mr.ABC");
          t3.setName("Mr.PQR");
          t1.start();
          t2.start();
          t3.start();
 }
public void run()
{
 for(int x=0; x<10; x++)
 {
 makeWithdrawal(10);
  if(acc.getBalance()<0)
 {
System.out.println("Account overdrawn");
```

```
void make withdrawal (int amt)
{
int bal;
bal = acc.getBalance();
if (bal >= amt)

{ int bal;
bal = acc.getBalance();
if (bal >= amt)
{
System.out.println("\t" + Thread.current
Thread().getName() + " withdraws Rs.":
+ amt);

try
{
Thread.sleep(100);
}
catch (InterruptedException ex)

{
}
acc.withdraw(amt);
bal = acc.getBalance();
System.out.println("\t The Balance :" + bal);

}
else
{
System.out.println("Insufficient Balance
in account for" + Thread.currentThread().
getName() + "to withraw" + acc.getBalance());
```

```
class Account
{
private int balance = 100;
public int getBalance ()
{
return balance;
}
public void withdraw (int amount)
{
balance = balance - amount;
}
}
```

priorities

Each thread has a priorities are represented by a number b/w 1 to

In most cases, thread scheduler schedules the threads according to their priority (known as preemptive scheduling).

There are 2 Commonly used functionalities in thread scheduling.

set priority -> Thread.Name.setpriority (priority-val);

get priority

3 Constants defined in Thread class

1. public static int MIN - PRIORITY (1)
2. public static int NORM - PRIORITY (5)
3. public static int MAX - PRIORITY. (10)

Default priority of a thread is 5.
Minimum priority of a thread is 1.
Maximum priority of a thread is 10.

Preemption:

Preemption is a situation in which when the currently executed thread is suspend temporarily by the highest priority thread.

The highest priority thread always preempts the lowest priority thread.

```
class A extends Thread
{
public void run()
{
System.out.println("Thread #1");
for (int i=1; i<=5; i++)
{
System.out.println ("\tA: "+i);
}
System.out.println("\n... End of Thread #1...");
}}
```

```
class B extends Thread
{ public void run()
{
System.out.println("Thread #2");
for (int k=1; k<=5; k++)
{
System.out.println("\tB" +k);
}
System.out.print("\n... End of Thread #2...");
} }
class Thread Progrgm
{
public static void main(String[] args)
{
A obj1 = new A();
B obj2 = new B();
obj1.setpriority(1);
obj2.setpriority(10);
System.out.println("starting Thread");
obj1.start();
System.out.println("starting Thread");
obj2.start();
} }
```

o/p

```
starting Thread #1
starting Thread #2
Thread #1
Thread #2
```

B:1
B:2
B:3
B:4
B:5

End of Thread #2 ...

A 1
A 2
A 3
A 4
A 5

End of Thread #1...

Synchronization

When two or more threads need to access shared memory, then there is some way to ensure that the access to the resource will be by only one thread at a time. The process of ensuring one access at a time by one thread is called synchronization.

There are two way to achieve the synchronization.

1. Using synchronized methods
2. Using synchronized Blocks.

1. Using synchronized method.

```
class Test
{
synchronized void display (int num)
```

```
{
System.out.println("\n Table for" +
                                num);
 for(int i=1; i<=10; i++
{
 System.out.print(" " +num*i);
}
System.out.println("\n End of Table");
try
{
Thread.sleep(1000);
}
catch(Exception e) {}
}}
class A extends Thread
{
Test th1;
A(Test t)
{
th1 = t;
}
public void run()
{
th1.display(2);
}
class B extends Thread
{
```

```
    Test th2;
    B(Test t)
{
 th2 = t;
 }
public void run()
{
  th2.display(100);
}
class MysynThread
{
public static void main(String args[])
{
Test obj = new Test();
    A t1 = new A(obj);
    B t2 = new B(obj);
    t1.start();
    t2.start(); }
}
```

output

```
javac MysynThread.java
java Mysynthread
Table for 2
  2  4  6  8  10  12  14  16  18  20
End of Table.
```

2. Using synchronized Block

When we want to achieve synchronization using the synchronized block then create a block of code and mark it as synchronized.

syntax:

```
synchronized (object reference)
{
 statement;
 statement;
 :
}
```

Ex:

```
class Test
{
void display (int num)
{
 synchronized (this)
 {
System.out.println ("\n Table for "+num);
for (int i=1; i<=10; i++)
 {
 System.out.print (" " +num*i);
 }
System.out. print ("\n End of Table");
try {
```

```
    Thread.sleep(1000);
  }
  catch(Exception e){}
 }
}
class A extends Thread
{
Test th1;
A(Test t)
{
th1=t;
}
public void run()
{
th1.display(2);
}}
class B extends Thread
{
 Test th2;
B(Test t)
{
th2=t;
}
public void run()
{
th2.display(100);
}}
```

```
class MysynThreadBlock
{
public static void main (String args[])
{
 Test obj = new Test();
   A t1 = new A(obj);
   B t2 = new B(obj);
    t1.start();
    t2.start();
  }}
```

output

```
javac MysynThreadBlock.java
java MysynThreadBlock
Table for 2
2 4 6 8 10 12 14 16 18 20
End of Table.
```

Inter Thread Communication

Two or more threads Communicate with each other by exchanging the messages. This mechanism is called interthread Communication.

IPC Inter process Communication is a process or mechanism that allows the exchange of data b/w process.

IPC allows one application to control another application

IPC enables data communication by allowing processes to use segments, semaphores and other methods to share memory and information.

Inter-thread communication (or) Co-operation is all about allowing synchronized threads to communicate with each other.

ITC is important when you develop an application where two (or) more threads exchange some information.

a thread is paused running in its critical section and another thread is paused running in its critical section and another thread is allowed to enter in the same critical section to be executed.

IT is implemented by following methods of object class Three built-in methods in ITC

1. wait()
2. notify()
3. notifyAll()

Ex:

Two Threads are created one for producer and another is for Consumer.

```
class Myclass
{
int val;
boolean flag = false;
synchronized int get()
{
 if (!flag)
try
{
wait();
 }
catch (Interrupted Exception e)
{
 System.out.println("Interrupted Exception");
  }
this.val = val;
 flag = true;
System.out.println("producer producing"+val);
notify();
}}
```

```
class producer extends Thread
{
Myclass th1;
producer(Myclass t)
{
th1=t;
}
public void run()
{
for(int i=0;i<10;i++)
{
th1.put(i);
}}}
class consumer extends Thread
{
Myclass th2;
Consumer(Myclass t)
{
th2=t;
}
public void run()
{
for(int i=0;i<10;i++)
{
th2.get();
}}}
```

```
class InterThread
{
public static void main (String[] args)
{
Myclass Tobj = new myclass();
Producer pthread = new Producer(Tobj);
Consumer cthread = new Consumer(Tobj);
pthread.start();
cthread.start();
}}
```

output

```
Producer producing 0
Consumer consuming 0
producer producing 1
consumer consuming 1
:
:
producer producing 9
Consumer Consuming 9.
```

Suspending - Resuming and stopping Threads

Stopping a thread :

A Thread can be stopped from running further by issuing the following statement

```
th.stop();
```

By this statement the thread enter

From stopping state a thread can never return to a runnable state.

sleep()

Sleep method a thread can be blocked for some specific time. when the specified time gets elapsed then the thread can return to a runnable state

suspend

suspend method the thread can be blocked until further request comes when the resume() method is invoked then the thread returns to a runnable state

wait

The thread can be made suspended for some specific conditions when the notify method is called then the blocked thread returns to the runnable state.

suspending thread

A thread is suspended then its execution is stopped temporarily

It returns to runnable state

Stopping thread

Execution is stopped permanently

Can never return to runnable state.

Resuming a thread:

The resume() method is only used with suspend() method.

This method is only to resume a thread which was suspended using suspend() method.

syntax

```
public final resume()
```

Wrappers

Wrapper classes allow primitive data types to be accessed as objects

primitive datatype	Wrapper class
boolean	Boolean
byte	Byte
char	character
double	Double
float	Float
int	Integer
long	Long
short	short
void	Void

Wrapper class Methods

```
Integer val = new Integer(int_var)
Float   val = new Float(f_var)
Double  val = new Double(d_var)
Long    val = new Long(long_var)
```

above methods an object is created for integer, float, double, long variables.

An Object holding an integer value is created then we can retrieve the integer value from it using typevalue() method.

```
int num = obj.intValue();
```

In order to convert the numerical value to string, the string() method can be used.

```
str = Integer.toString(int_val)
```

The variable int_val can be converted to String str.

The wrapper classes do not contain the constructors.

The methods of the wrapper classes are static.

```
import java.io.*;
import java.lang.*;
class WrapperDemo
{
public static void main (String[] args)
{
System.out.println("Creating an object for
                    value 10");
Integer I = new Integer(10);
System.out.println("obtaining the value
back from the object" + i.Intvalue());
String str = "100";
System.out.println("The string is " +str);
System.out.println("obtaining the numeric
                    value from the string"
    + Integer.parseInt(str);
}}
```

output

Creating an object for value 10
obtaining the value back from the
object : 10
The string is : 100
obtaining the numeric value from
the string : 100.

Auto Boxing

An automatic conversion of primitive datatype into equivalent wrapper type is called as auto boxing.

→ This is new feature of Java 5.

```
class AutoboxEx
{
public static void main(String args[])
{
Integer obj = 111;
int val = obj.byteValue();
System.out.println("object value =" + obj);
System.out.println("The primitive
                    value =" + val);
}
}
```

o/p

```
javac AutoboxEx.java
java AutoboxEx
Object value = 111
The primitive value = 111
```

UNIT - 3

EXCEPTION HANDLING and MULTITHREADING

PART-A (2 Marks)

1. What is an exception? Give example.
2. what is runtime exceptions?
3. what is exception handling?
4. what do you mean by threads in java?
5. what are the different stages in thread?
6. what do you mean by synchronization?
7. what are the three ways by which the thread can enter is waiting stage?
8. what is multithreading?
9. what are the two ways of creating a thread?
10. why do we need run() and start() method both? Can we achieve it with only run() method.
11. what is the need for thread?
12. Name any four thread constructor.
13. Sketch the life cycle of thread.
14. write the types of exception.

PART-B (16 Marks)

1. Explain the different types of exceptions and exception hierarchy in Java with appropriate example. 16M
2. write a note on built-in exception 6M
3. Explain try-catch block in exception 6M
4. Explain multiple catch clauses in exception handling. 6M
5. write a note on Nested try statement 6M
6. write a note on Finally statements. 6M
7. write a note on throws statement. 6M
8. write a note on throw statement with example. 8M
9. Explain user-defined Exception 8M
10. what is Thread? Explain multithreading and multitasking in detail? 13M
11. Explain in detail the different states of a thread. 13M
12. Explain how threads are created in java. 16M

Unit - IV

I/O, Generics, String Handling

4.1 I/O Basics

I/O = Input / output

Java I/O is used to process the input and produce the output.

Java uses the Concept of stream to make I/O operation fast.

The java.io packages Contains all the classes required for i/o operations.

4.1.1 Stream

A stream is a sequence of data. In Java a stream is Composed of bytes.

In Java 3 streams are created for us automatically,

1. System.out → Standard o/p stream
2. System.in → Standard I/P stream
3. System.err → Standard error stream

Streams are the sequence of data that are read from the source and written to the destination.

An i/p stream is used to read data from the source. And an o/p stream is used to write data to the destination.

```
class Helloworld
{
public static void main (String [] args)
{
System.out.println ("Hello, world"!);
}
}
```

→ system.out to print a string.

Here system.out is a type of o/p stream

The input streams to take input system.in.

Types of streams (data)

→ Depending upon the data a stream holds, it can be classified into

1. Byte stream 2. Character stream

Byte stream:

→ Byte stream is used to read & write a single byte (8 bits) of data.

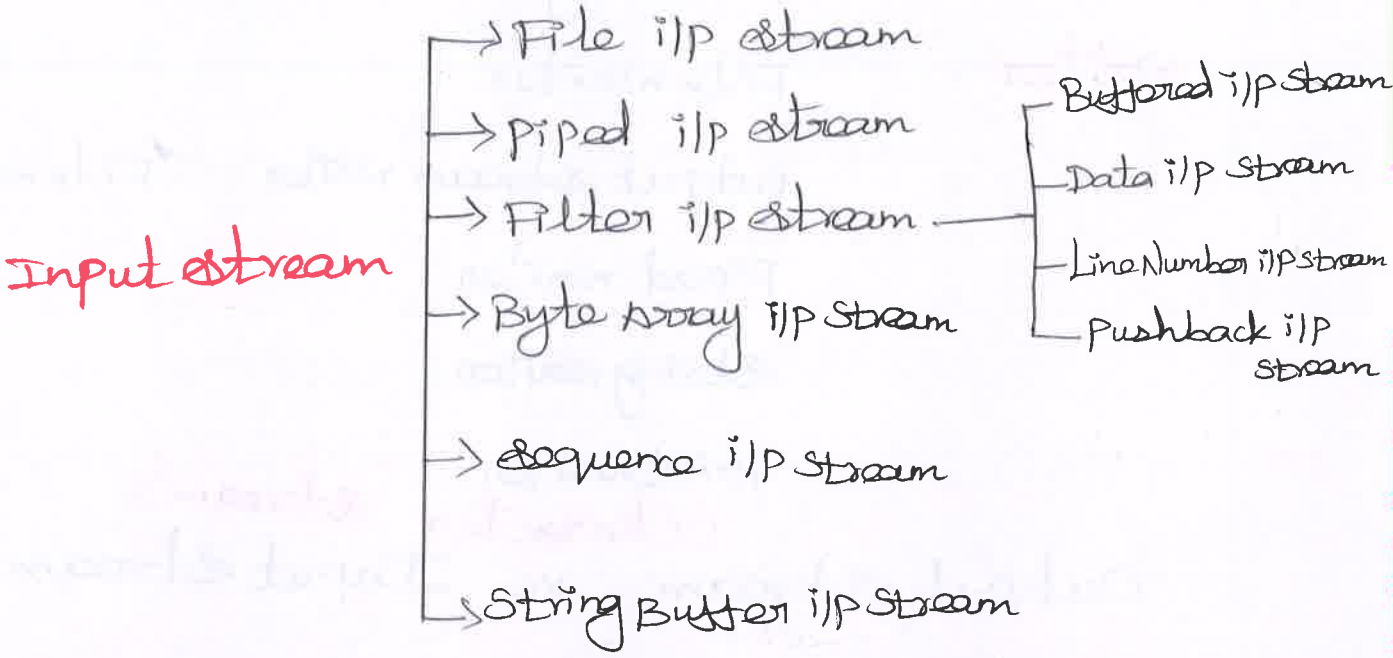
→ All the byte stream classes are derived from base abstract classes called InputStream and OutputStream.

Character stream:

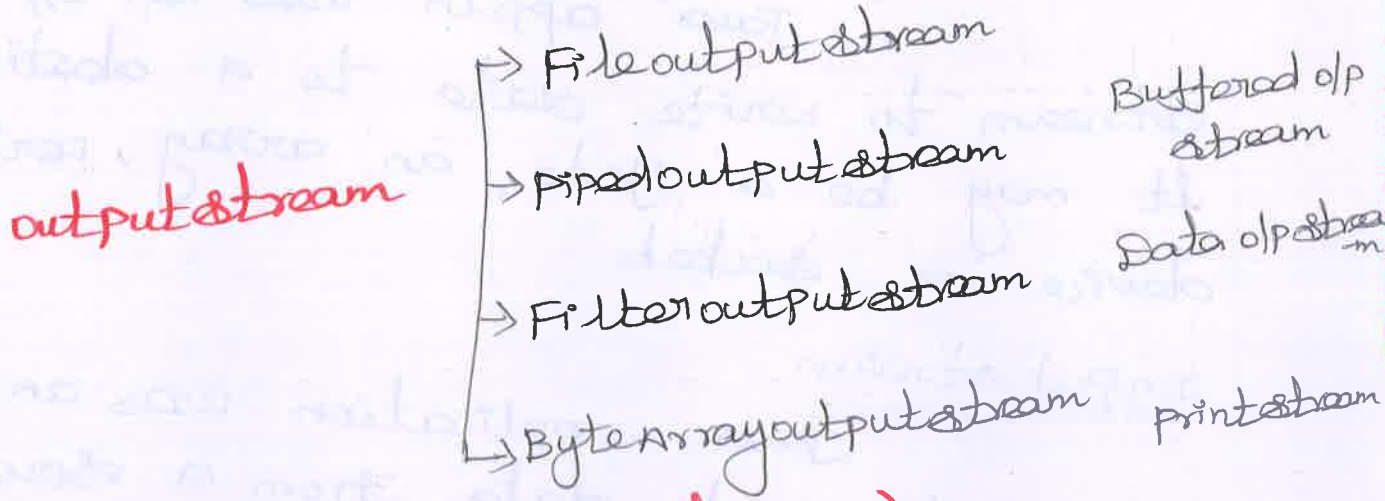
→ Character stream is used to read and write a single character of data.

→ All the character stream classes

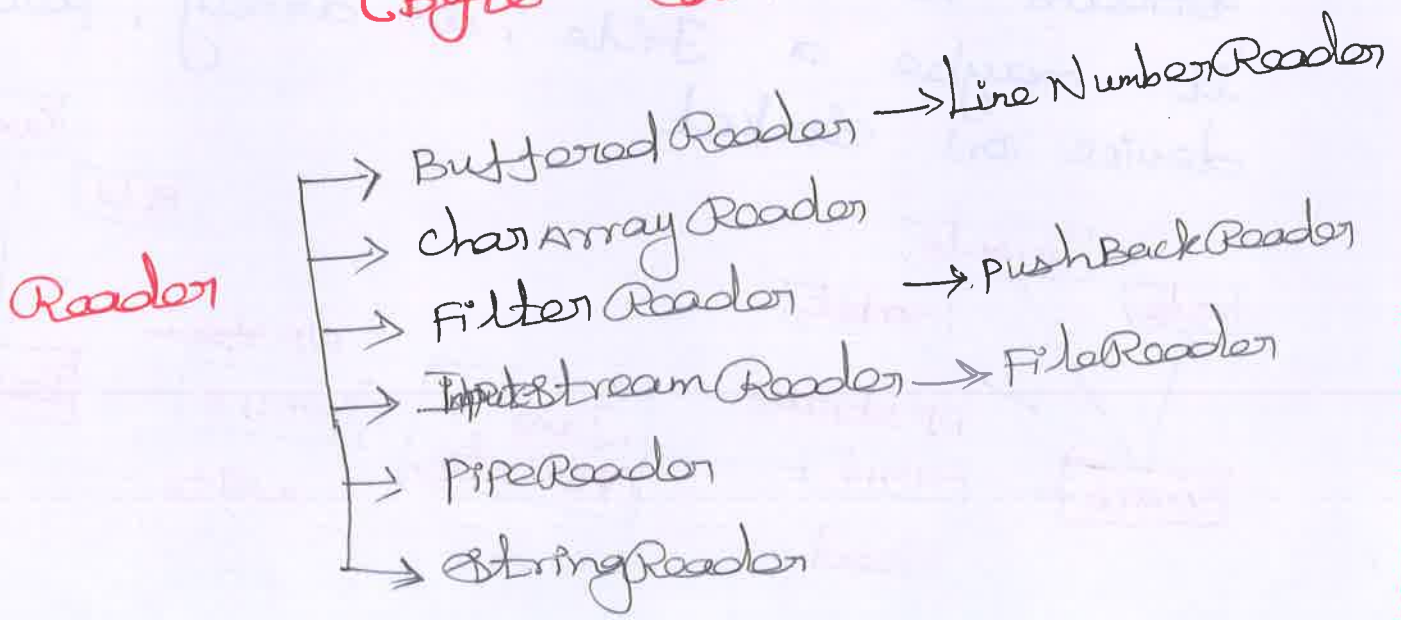
are derived from base abstract classes Reader and Writer.



Input stream classes



(Byte stream)



writer

- Buffered writer
- char array writer
- FileWriter
- output stream writer — FileWriter
- Piped writer
- String writer
- PrintWriter

(character stream)

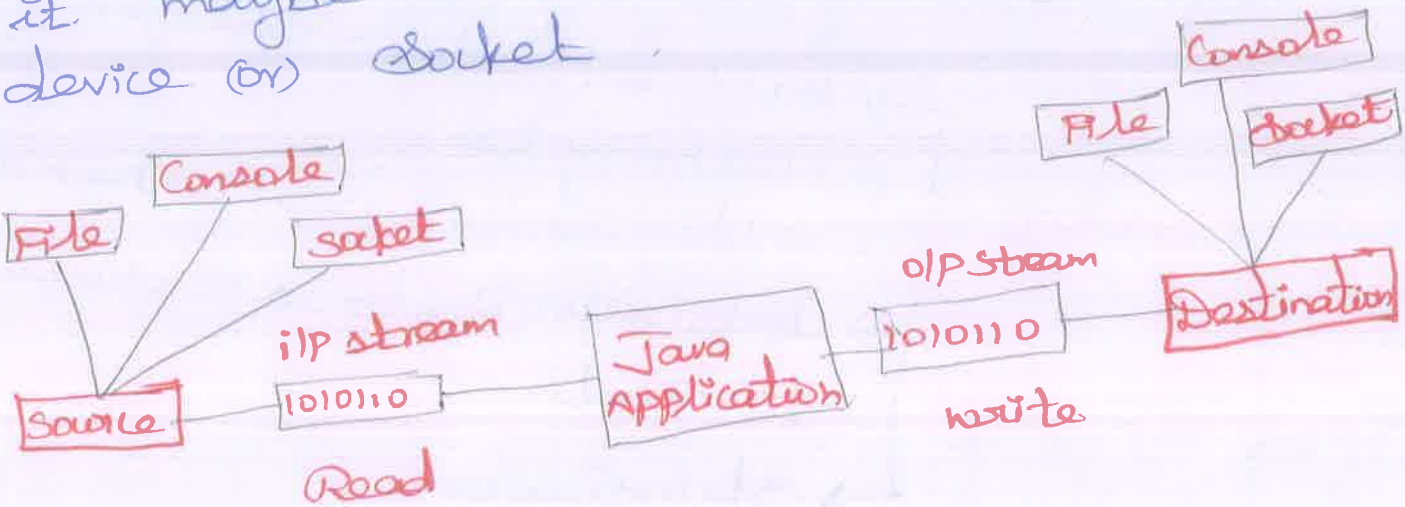
Output Stream Vs Input Stream

output stream

Java appln uses an o/p stream to write data to a destination it may be a File, an array, peripheral device or socket.

Input Stream

Java application uses an i/p stream to read data from a source it maybe a File, an array, peripheral device (or) socket.



Output stream class.

→ Output stream class is an abstract class.

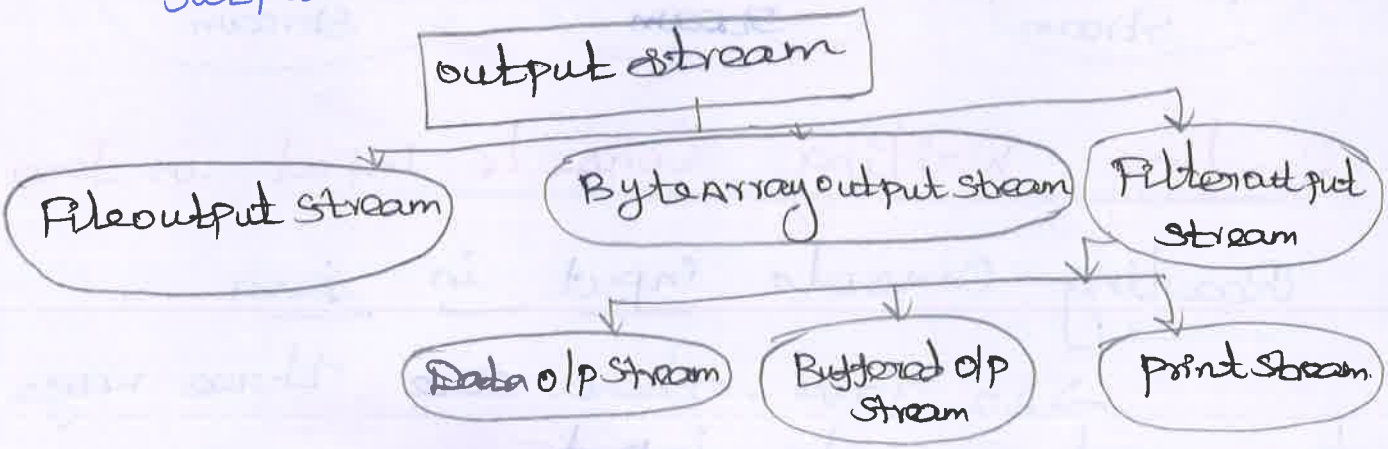
→ It is the superclass of all classes representing an output stream of bytes.

→ An o/p stream accepts output bytes and sends them to some sink.

useful Methods of output stream

1. public void write(int) throws IOException
   → It is used to write a byte to the current o/p stream.
2. public void write(byte[]) throws IOException
   → It is used to write an array of byte to the current o/p stream.
3. public void close() throws IOException
   → It is used to close the current o/p stream.

output stream Hierarchy.



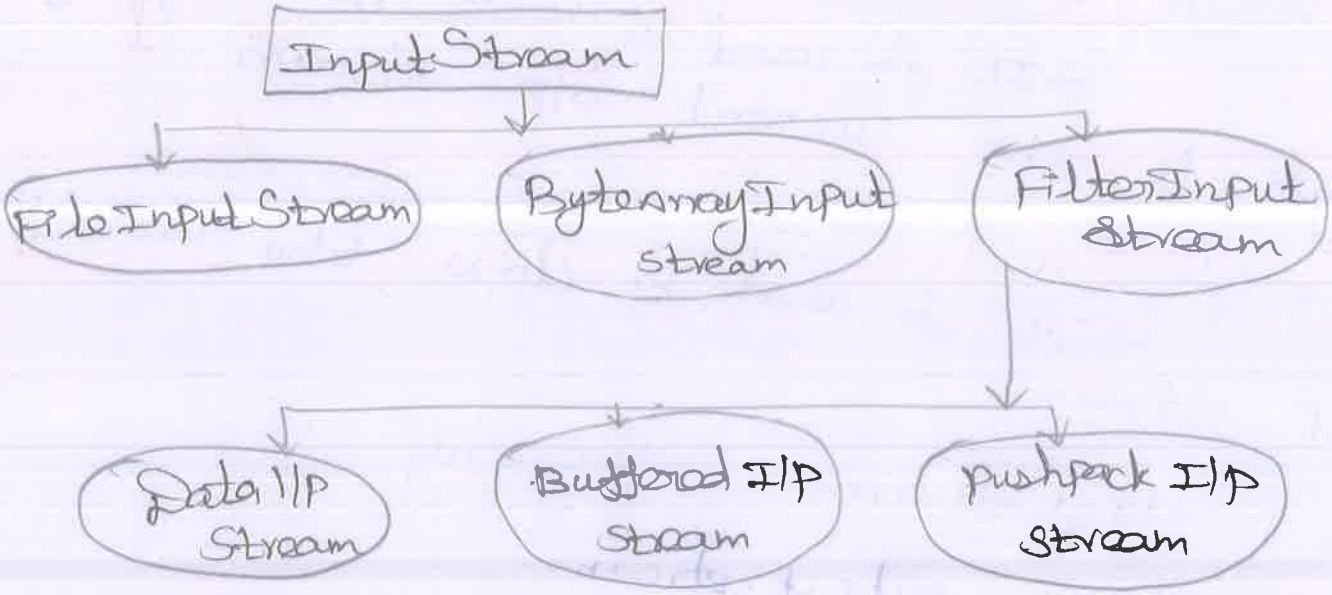
InputStream class

->InputStream class is an abstract class. It is the superclass of all classes representing an i/p stream of bytes.

Useful Methods of Input Stream

1) public abstract int read() throws IOException
2) public int available() throws IOException
3) public void close() throws IOException.

Input stream Hierarchy



Reading Writing Console input in Java

Reading Console input in Java

->In Java, there are three ways to read Console input.

It is used to get input at runtime using the 3 following ways, we can read i/p data from the console

1. Using BufferedReader class.
2. Using Scanner class
3. Using Console class.

1. Reading Console i/p using BufferedReader class in Java.

→ Reading i/p data using the BufferedReader class is the traditional technique.

→ The reading method is used by wrapping the System.in in an InputStreamReader which is wrapped in a BufferedReader.

The BufferedReader class has defined in the java.io package.

Example:

```
import java.io.*;
public class ReadingDemo
{
public static void main (String[] args) throws
                                    IOException
```

```
BufferedReader in = new BufferedReader(new
InputStreamReader (System.in));

  String name = " ";
try {
System.out.print (" please enter your Name :");
  name = in.readLine();
System.out.println (" Hello", + name + "!");
 }
Catch ( Exception e)
{
System.out.println (e);
  }
finally
{
  in.close ();
   } } }
```

o/p

please enter your name:
ARUN

Hello, ARUN !

2. Reading Console input using Scanner class in Java.

→ Reading i/p data using the Scanner class is the most the Scanner class is the most Commonly used method

→ The reading method is used by wrapping the System.in which is wrapped in

a Scanner.

The Scanner class has defined in the java.util package.

Ex:

```
import java.util.Scanner;
class Main
{
public static void main (String[] args)
{
Scanner myobj = new Scanner (System.in);
System.out.println ("Enter Ur username");
String userName = myobj.nextLine();
System.out.println ("username is :" +
                    userName);
}
}
```

output

please enter your name : AEUN

Hello, AEUN

3. Reading console i/p using console class in Java

Reading i/p data using the console class is the most commonly used method.

This class was introduced in

The Console class has defined in the java.io package.

Ex:

```
import java.io.*;
public class ReadingDemo
{
public static void main(String[] args)
{
 String name;
Console con = System.console();
     if (con != null)
{
name = con.readLine("please enter your
                     name:");
System.out.println("Hello " + name + "!!");
}
else
{
System.out.println("console not available");
}}}
```

Writing console output in Java.

In Java, there are two methods to write console output

1) Using print() and println() methods
2) Using write() method

Writing Console output using Print() and Println() methods

The PrintStream is a built-in class that provides two methods print() & println() to Write console output.

The print() and println() methods are the most widely used methods for Console output.

Print()

The print() method writes console output is the same line

println()

The println() method writes console output is a separate line (new line).

This method Can be used with Console ans also with other output sources.

Ex:

```
public class writingDemo
{
  public static void main (String [] args)
  {
    int [] list =new int [5];
  for (int i=0; i<5; i++)
      list [i] = i * 10;
   for (int i : list)
     System.out.print (i);
```

```
System.out.println(" ");
 for (int i:list)
System.out.println(i);
} }
```

o/p

0 10 20 30 40

0
10
20
30
40

Writing Console output using write() method

The write() method take integer as argument and writes its ASCII equalent character on to the console, it also accept escape sequences.

Ex:

```
public class WritingDemo
{
public static void main(String[] args)
{
 int[] list = new int[26];
 for(int i=0; i<26; i++)
{
 list[i] = i+65;
 }
for(int i:list)
{
System.out.write(i);
System.out.write("\n");
} } }
```

output

A
B
C
D
E
F
G
H
I
J

Reading and writing Files

InputStream is an abstract class for streaming the byte input.

Methods:

```
int available()
void close()
void mark(int n)
boolean markSupported()
void reset()
long skip(long n)
```

OutputStream is an abstract class for streaming the byte output.

Methods:

```
void close()
void flush()
void write(int val)
void write(byte buffer[])
void write(byte buffer[], int offset, int n)
```

FileInputStream | FileOutputStream

The FileInputStream class creates an Inputstream using which we can read bytes from a file.

The 2 Common Constructors of FileInputStream are

1. FileInputStream(String filename);
2. FileInputStream(File fileobject);

The FileOutputStream can be used to write the data to the file using the Output stream.

The Constructors are

1. FileOutputStream (String filename)
2. FileOutputStream (object fileobject)
3. FileInputStream (String filename, boolean app);
4. FileInputStream (String file object, boolean app);

The app denotes that the apperd mode can be true or false.

FilterInputStream | FilterOutputstream.

FilterStream class are those classes which wrap the i/p stream with the byte.

If we want to read integers, doubles or strings you need to a filter class to wrap the byte input stream.

Syntax:

FilterOutputStream (OutputStream o)

FilterInputStream (InputStream i)

The methods in the filter stream are similar to the methods in i/p stream and output stream.

DataInputStream | DataOutputStream

1. Data i/p stream reads bytes from the stream and Converts them into appropriate primitive data types whereas the Data output stream Converts the primitive data types into the bytes and then writes this bytes to the stream.

→ The superclass of DataInputStream class is FilterInputStream and superclass of DataOutputStream class is FilterOutputStream class

Buffered input stream | Buffered output stream

→ The Buffered Input Stream & Buffered output stream is an efficient class used for speedy read and write operations.

→ All the methods of Buffered InputStream and BufferedOutputStream class are inherited from InputStream and OutputStream classes.

→ Methods add the buffers in the stream for efficient read and write operations.

→ we can specify the buffer size otherwise the default buffer size is 512 bytes.

Create an IN File in Java to store ⑨ the details of 100 students using student class. Read the details from IN File, convert all the letters of IN file to lowercase letters and write it to OUT File.

```
import java.io.Serializable;
public class Student implements
  Serializable
{
Private  static final long serialVersionUID = 1L;
Private String first_name;
Private String last_name;
 private  int age;
 public Student (String fname, String lname,
                                  int age)
{
 this.first_name = fname;
 this.last_name = lname;
 this.age = age;
 }
public void setFirstName (String fname)
{
 this.first_name = fname;
 }
 public String getFirstName()
{
 this.first_name = lname;
```

```
    public String getLastName()
{
 return this.last-name;
 }
 public void setAge(int age)
  {
    int.age = age;
  }
  public int getAge()
  {
    return this.age;
  }
@override
public String toString()
{
return new StringBuffer("\t").append
                (this.first-name).append
("\t").append(this.last-name).append("\t").
append(this.age).toString();
 } }
```

Generics

Generic is a mechanism for creating a general model in which generic methods and generic classes enable programmers to specify a single method and single class for performing the desired task.

Generic Methods

Generic method allows a programmer to write a generalised method of different data types.

write generic method for sorting an array of integer objects.

```
private <E extends comparable <E> void
bubbleSort (E[] arr)
{
 E temp;
for (int j = 1; j < Arr.length ; j++)
{
for (int i = 0; i <Arr.length -j; i++)
{if (Arr[i].CompareTo (Arr[i+1])>0)
{
temp = Arr [i];
 Arr [i] = Arr [i+1];
 Arr [i+1] = temp;
}}
for (E i : Arr)
{
System.out.Print (" " +i);
}}
```

Generic classes

A Generic class contains one or more variables of generic data type.

```
public class Test <T>
{
public Test()
{
   val = null;
   }
public Test (T val)
{
 this.val = val;
 }
 public getval()
{
  return val;
 }
 public setval()
{
  val = newValue();
 }
 private T val;
 }
```

Bounded Types

-> while creating objects to generic classes we can pass any derived type as type parameters.

→ May times it will be useful to limit the types that can be passed to type parameters. For that purpose bounded types are introduced in generics.

→ Using bounded types we can make the objects of generic class to have data of specific derived types.

Syntax:

<T extends Superclass>

'T' can only be replaced by 'superclass' or it's subclass.

Ex:

```
class Test <T extends Numbers>
{
 T t;
 public Test (T t)
{
 this.t = t;
 }
 public T getTC)
{
 return t;
 } }
public class BoundedTypeDemo
{
 public static void main (String[] args)
{ Test <Number> obj1 = new Test <Number>(123);
```

```
System.out.println("The integer is"
                    + obj1.getT());
Test<String> obj2 = new Test<String>
                    ("I am String");
System.out.println("The string is"
                    + obj2.getT());
}}
```

Restrictions and Limitations

1. In Java, Generic types are Compile time entities. The runtime execution is possible only if it is used along with raw type.

2. Primitive type parameters is not allowed for generic programming.

3. For the instances of generic class throw and catch instances are not allowed.

```
public class Test<T> extends Exception
{
// code
}
```

4. Instantiation of generic parameter T is not allowed.

```
new T()
new T[10]
```

5. Arrays of parameterized types are not allowed.

6. Static fields and static methods with type parameters are not allowed.

Strings

String class:

String

String is a collection of characters. In Java String defines the object. The String is normally used to represent the collection of characters.

Ex:

```
class StringDemo
{
public static void main(String args[])
{
String s = "Hello, How are You";
System.out.println(s);
}}
```

o/p

Hello, How are You ?

String Literal:

In Java String can be represented as sequence of characters enclosed with in the double quotes.

String Methods:

The length of a given String using the method length().

Ex:

```
class strLengthDemo
{
public static void main (String[] args)
{
String s = "Hello";
String s = new String(str);
char str[] = {'p', 'r', 'o', 'G', 'r', 'A', 'M'};
System.out.println("The String S is"+S);
System.out.println("The length of String
                    is" + S.length());
for (int i = 0; i<S.length(); i++)
System.out.print(str[i]);
}}
```

O/P

The String S is PROGRAM
The length of String is 7.
The String in character array is
PROGRAM

String in reverse direction

There is no direct method for reversing the string but we can display it in reverse direction.

Ex:

```
class str_reverse
{
public static void main [String[] args)
{
char Str [] = {'S', 'T', 'R', 'I', 'N', 'G' };
String S = new String (str);
System.out.println ("The string S is" + S);
System.out.print (" The string written in
Reverse order");
for (int i = S.length () -1; i >=0; i--)
System.out.print (Str[i]);
}}
```

output

The string S is STRING
The string written in Reverse order
GNIRTS

Character Extraction:

String is a collection of character. String class provides the facility to extract the character from the string object.

The charAt (index) method help the extract the character denoted by

some index in the array.

Ex:

```
String fruit = new String ("mango");
char ch;
ch = fruit.charAt (2);
System.out.println (ch);
```

o/p

n

String Comparison

→ we need to know whether two strings are equal or not.

→ we use method equals() for that purpose. This method is of Boolean type. That is, if two strings are equal then it returns true otherwise it returns false.

Syntax:

```
Boolean equals (String str);
```

Ex:

```
class StringCompareDemo
{
public static void main (String[] args)
{
String str1 = new String ("INDIA");
String str2 = new String ("india");
if (str1.equals (str2) == true)
System.out.println ("The two strings are equal");
else
```

```
System.out.println("In The two strings
are not equal");
    }
}
```

O/P

The two strings are not equal

Concatenating strings

We can concatenate two strings using + operator

Ex:

```
class Test
{
public static void main(String[] args)
{
String fruit = new String("mango");
System.out.println("I like" + fruit +
                   "very much");
    }
}
```

O/P

I like Mango very much.

Upper and lower Case

We can convert the given String to either upper case or lower case using the methods

to uppercase()
to lowercase()

Ex:

```
class CaseDemo
{
public static void main (String[] args)
{
String str = new String ("Nisha is Indian");
System.out.println ("\n The original
                    string is " + str);
String str-Upper = str.toUppercase();
System.out.println ("\n The uppercase
                    string is " + str-upper);
String str-lower = str.toLowercase();
System.out.println ("\n The Lower case
                    string is " + str-lower);
}}
```

o/p

The original string is : Nisha is Indian

The upper case string is : NISHA IS INDIAN

The Lower case string is : nisha is indian.

String Buffer class

The String Buffer is a class which is alternative to the string class.

-> The StringBuffer class is more flexible to use than the String class.

-> The StringBuffer and the StringBuilder are almost one and the same.

The StringBuilder or StringBuffer have three constructors and 30 Methods.

Method

append (String str)

capacity ()

charAt (int index)

length()

toString()

reverse()

write a Java Program to convert the String 'Great' to a new string 'God'

```
public class StringBuffDemo2
{
public static void main (String args[])
{
StringBuffer str = new StringBuffer ("Great");
System.out.println ("The String is" +str);
str.setCharAt (1, 'o');
str.setCharAt (2, 'd');
str.setLength (3);
```

```
System.out.println(" Now the String is "
                                +Str);
}}
```

output

The String is : Great
Now the String is : God

Write a Simple Java program to check the palindrome of the given string.

```
public class StringBuffDemo
{
public static void main(String args[])
{
String str1 = new String("Java");
StringBuffer str2 = new StringBuffer(str1);
str2.reverse();
System.out.println("Initially the
    String is " + str1);
System.out.println("Reversed String is"+
                                str2);
if(str1.equals(str2.toString()))
System.out.println("This string is
                        palindrome");
else
System.out.println("This string is not
                        Palindrome");
}}
```

output

Initially the string is : Java

Reversed string is : avaJ

The string is not palindrome.

Write a simple Java program to change the string "impossible" to "possible".

```
public class StringBuffDemob
{
public static void main (String args[])
{
StringBuffer str1 = new StringBuffer ("Impossibb");
System.out.print ("The word " + str1);
str1.delete (0, 2);
System.out.println (" is changed to " + str1);
}}
```

output

The string impossible is changed to possible.

U-IV

I/O, Generics, String Handling

2 Marks

1. What is stream?
2. What is input stream and output stream?
3. List the byte stream classes.
4. Give an example for reading data from files using FileInputStream.
5. Why Generic programming is required?
6. List any two advantages of type parameters
7. Compare the Byte stream and Character stream.
8. How to read/write Files in Java.
9. Explain Generic programming
10. What is the need for Generic?
11. What is generic methods?
12. What is generic classes?
13. What is Bounded Types?
14. What are the restrictions and limitations of bounded types?
15. Define Java String.
16. What are the string methods used in Java.

PART - B

1. Explain stream and its types with classes in Java
2. Explain Reading and writing console input/output in Java
3. Explain Reading and writing Files in Java.
4. Create an IN File in Java to store the details of 100 students using student class.
5. write generic Method for sorting an array of integer objects.
6. Explain briefly about Generic programming.
7. Explain the use of bounded types in Generics. write the Restrictions and Limitations.
8. what is String? Explain following String methods with suitable program. 1) length() 2) comparision 3) Concatanation
9. Explain String Buffer classes with suitable program.
10. write a Java program that arranges the given set of strings in alphabetical order. Supply the strings through the Command Line.

Unit - V

JAVAFX , Co

Basics of JAVAFX

History: JAVAFX was originally developed by Chris oliver, when he was working for a Company name See Beyond Technology Corporation, which was later acquired by Sun Microsystems in the year 2005.

JavaFx is a java library used to develop Desktop applications as well as Rich Internet Applications (RIA).

The applications built in JavaFx Can run on multiple platforms including web, Mobile & Desktops.

Features of JavaFx

1. Written in java
2. FXML
3. Scene Builder
4. Swing Interoperability
5. Built-in UI controls
6. CSS like styling
7. Canvas and printing API
8. Rich set of API's
9. Integrated Graphics library.
10. Graphics Pipeline.

Every JavaFx program is divided into three main Components.

1. Stage 2. Scene 3. Node and Scene graph

JavaFx Application Structure

JavaFx appln is divided into three main Components known as Stage, Scene and nodes.

We need to import javafx.application.Application class in every JavaFx application.

This provides the following life cycle methods for JavaFx application.

1. public void init()
2. public abstract void start(Stage primaryStage)
3. public void stop()

is order to create a basic JavaFx application into our code

1. import javafx.application.Application into our code.
2. Inherit Application into our class.
3. override start() method of Application class.

Frame:

→ Frame is a standard graphical window

Stage

Stage in JavaFx appln is similar to the Frame.

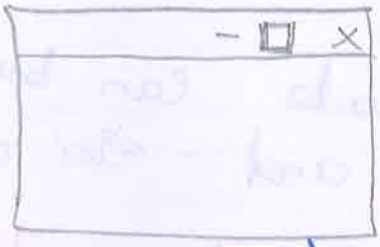
It acts like a Container for all the JavaFx objects.

Primary stage is created internally by the platform.

other stages can further be created by the application.

The object of primary stage is passed to start method.

we need to call show method on the primary stage object in order to show our primary stage.



(primary stage)

We can add various objects to this primary stage.

A node may be any object of the user's interface like text area, buttons, shapes, media etc.

The object of primary stage is passed to to the start() method.

There is show method that is used to show the stage.

Scene:

Scene actually holds all the physical contents (node) of a JavaFx application.

Javafx.scene.Scene class provides all the methods to deal with a scene object.

Creating scene is necessary inorder to visualize the contents on the stage.

Scene Graph and Node:

The scene graph is a collection of various nodes. The node is an element that can be visualized on the screen.

The node can be button, textbox, radio button and so on.

Important application Methods used in JavaFx

start():

This method is used to write the code for JavaFx application. The construct for this method is

public abstract void start(stage primaryStage)

2) launch().

To launch the application using the launch() method.

This method internally calls the start() method of the application class.

launch() method is static, you need to call it from a static method such as main.

Writing first JavaFx Application program

We can create an application program in NetBoan IDE or Eclipse IDE.

Steps:

Before executing the JavaFx application program, you need to have following things installed in your PC.

i) Java 8 ii) NetBoans 8

step1 : 1. From the File Menu. Choose New project.

2. Select JavaFx application category.
3. Choose JavaFx Application
4. Click Next.

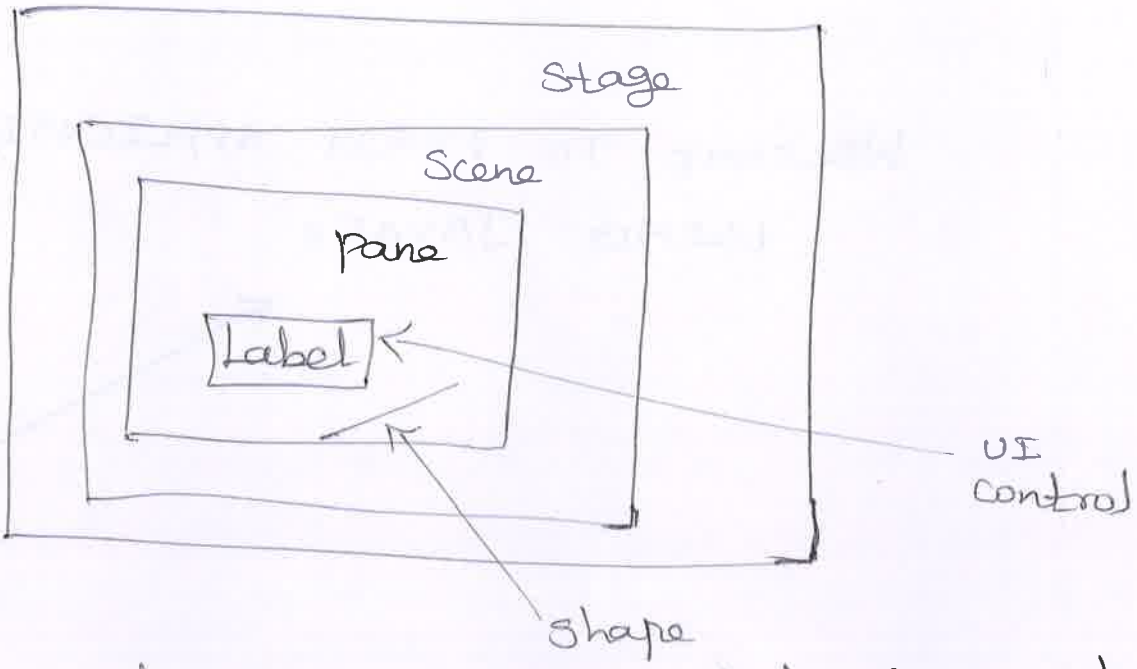
Then the code can be written as follows

```
package myjavafxapplication;
import javafx.application.Application;
import static javafx.application.Application.
                                launch;
import javafx.scene.Scene;
import javafx.scene.control.Label;
import javafx.stage.Stage;
public class MyJavaFxApplication extends
Application
{
@ override
   public void start(Stage primaryStage)
{
Label L = new Label("WELCOME TO FIRST
        APPLICATION USING JAVAFX");
Scene scene = new Scene(L, 300, 300);
primaryStage.setTitle("FIRST DEMO PROGRAM");
primaryStage.setScene(Scene);
primaryStage.show();
}
public static void main(String[] args)
{ launch(args); } }
```

UI Controls refer to label, button, checkbox, radio buttons and so on.

Shapes refer to lines, rectangle, Circle and so on.

A scene can be displayed in a stage.



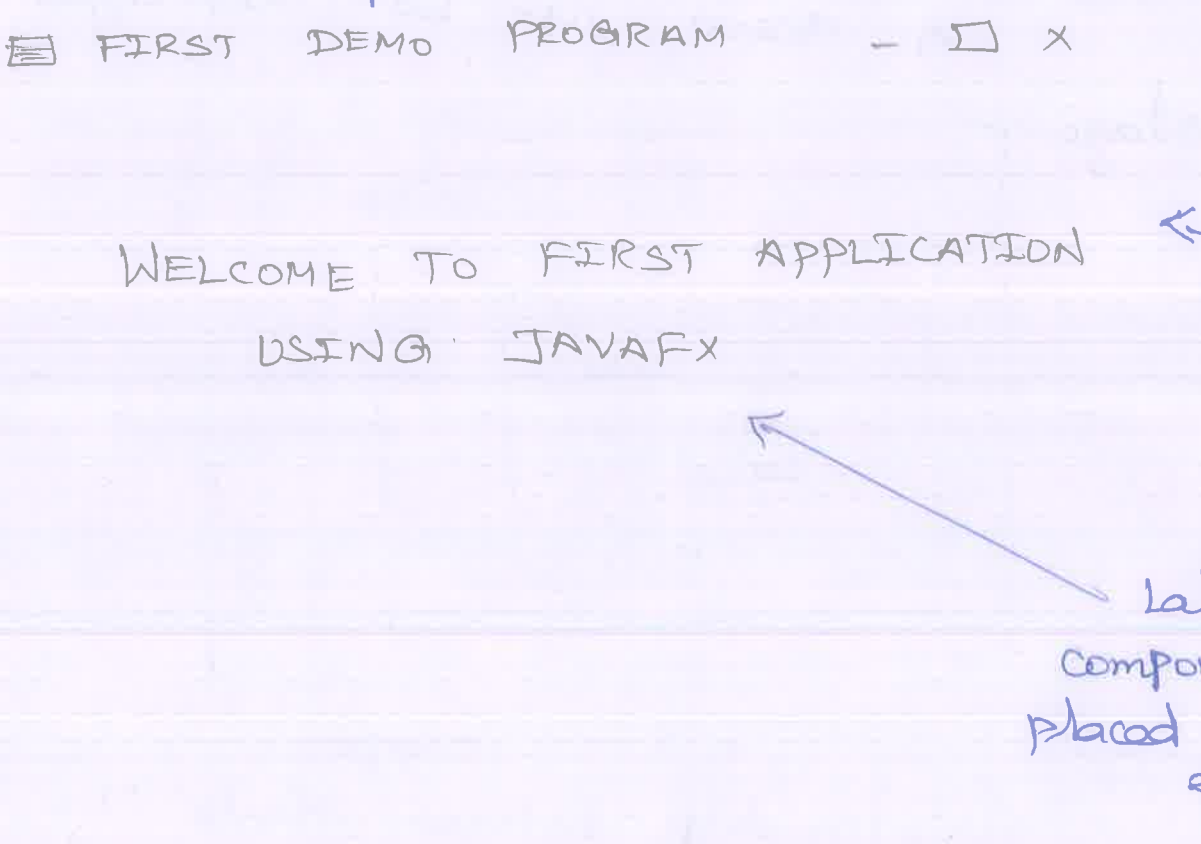
Relationship between Node (UI control and Shape), Pane, Scene and Stage.

```
Package myjavafxapplication;
import javafx.application.Application;
import javafx.scene.Scene;
import javafx.scene.control.Button;
import javafx.scene.layout.StackPane;
import javafx.stage.Stage;
public class MyJavaFxApplication extends
Application
{ @override
```

Step 2:

Now right click on the Source File and click on Run File As. The output will be displayed as follows.

↑ Title created using output setTitle() method



Panes and UI controls

Pane is a container class using which the UI components can be placed at any desired location with any desired size.

Generally you place a node inside a pane and then place pane into a scene.

Actually node is any visual components such as UI controls, shapes or a image view.

```
public void start(Stage primaryStage)
{
Button btn = new Button("Click Me");
Stackpane root = new StackPane();
root.getChildren().add(btn);
Scene scene = new Scene(root, 300, 250);
PrimaryStage.setTitle("Demo Program");
PrimaryStage.setScene(scene);
PrimaryStage.show();
}
public static void main(String[] args)
{
  launch(args);
}}
```

Property Binding

JavaFx introduces a new concept called binding property that enables a target object to be bound to a source object.

If the value in the source object changes, the target property is also changed automatically.

The target object is simply called a binding object or a binding property.

A target binds with a source using the bind method as follows

```
target.bind(source);
```

The bind method is defined in the javafx.beans.property.Property interface.

A binding property is an instance of javafx.beans.property.Property.

A source object is an instance of the javafx.beans.value.Observable value interface.

```
SimpleIntegerProperty num1 = new SimpleIntegerProperty(10);
```

```
SimpleIntegerProperty num2 = new SimpleIntegerProperty();
public void test()
{
System.out.println(num2.get());
num2.bind(num1);
System.out.println(num2.get());
num1.set(20);
System.out.println(num2.get());
}
```

Event Basics

Event means any activity that interrupts the current ongoing activity.

Ex: when user clicks button then it generates an event.

To respond to button click we need to write the code to process the button clicking action.

Event Source object:

The object that generates the event is called event source object.

Event Handler:

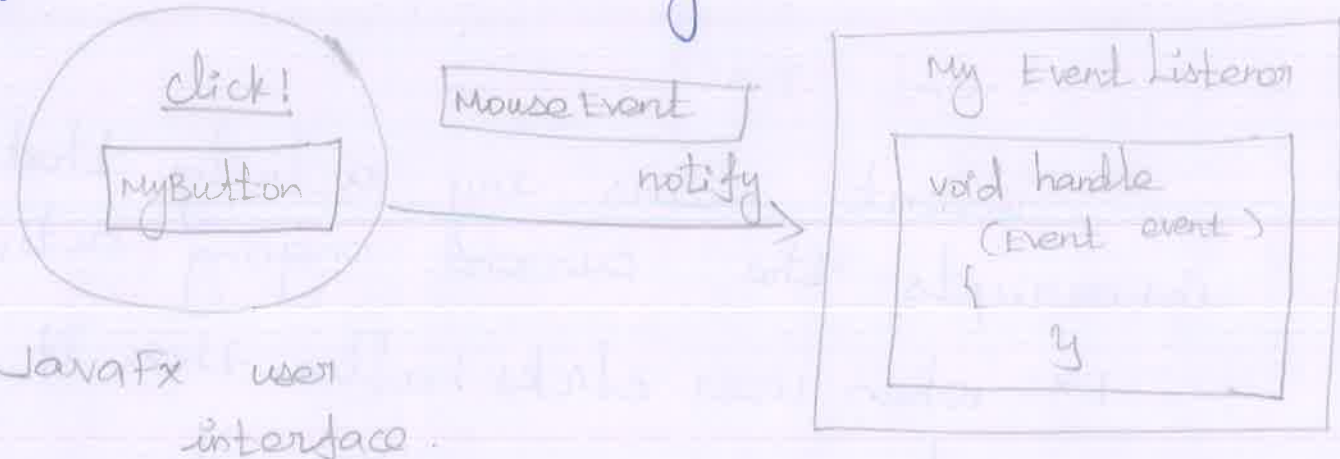
The event handling code written to process the generated event is called event handler.

Event Listner:

The task of handling an event is carried out by event listener.

When an event occurs, first of all an event object of the appropriate type is created.

This object is then passed to a listener. A listener must implement the interface that has the method for event handling.



Registering Handlers and Handling Events

JavaFx has just one interface for all kinds of Event Handlers.

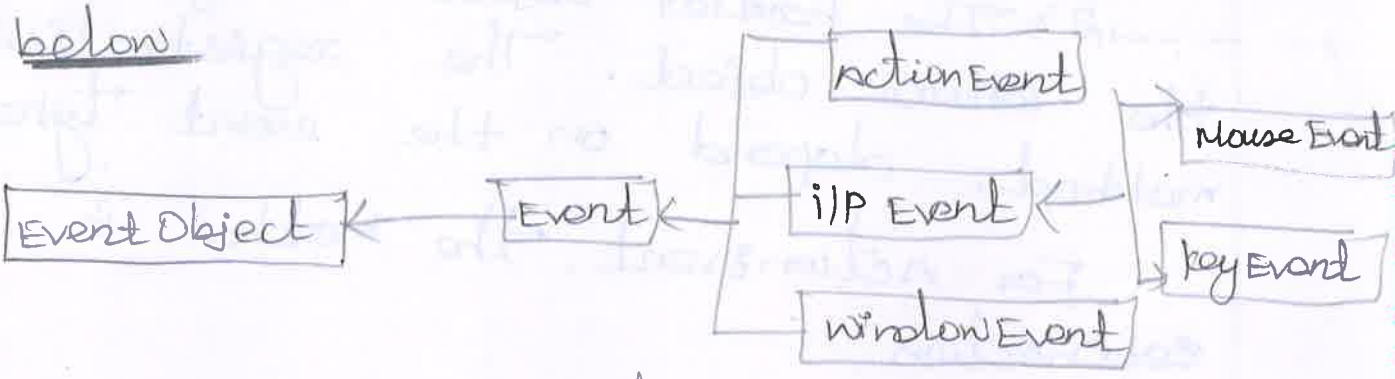
It is an instance of the EventHandler<T extends Event> interface.

This interface defines the common behavior for all handlers.

<T extends Event> denotes that T is a generic type that is a subtype of Event

The EventHandler<ActionEvent> interface contains the handle(ActionEvent) method for processing the action event.

The event class hierarch is shown below



Event class hierarchy

There are user actions that are associated with some source objects.

User Action	Source object	Event Type
Click button	Button	ActionEvent
Click radio button for check or uncheck	radio button	ActionEvent
Select an item	Combobox	ActionEvent

Event Registration Method

setOnAction(EventHandler<ActionEvent>).

The event handling process is a two step process.

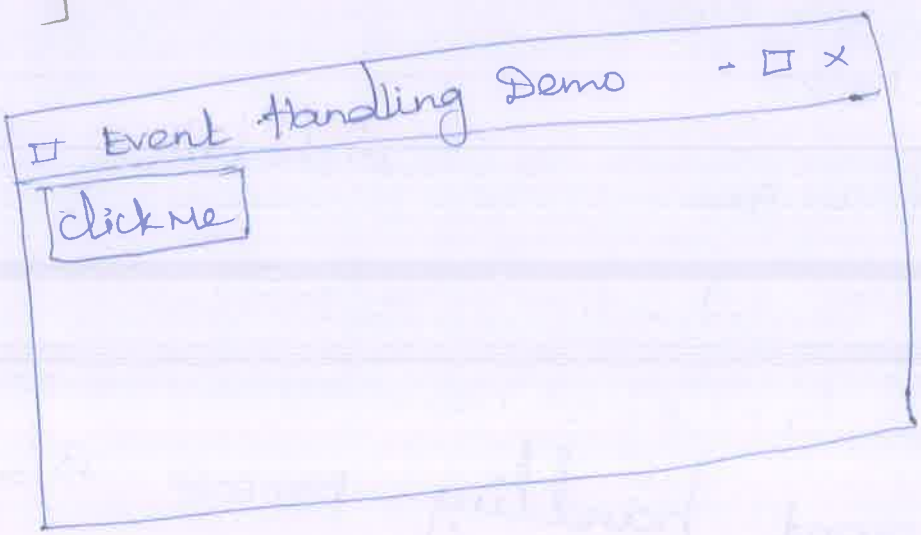
1) The handler object is an instance of appropriate EventHandler interface.

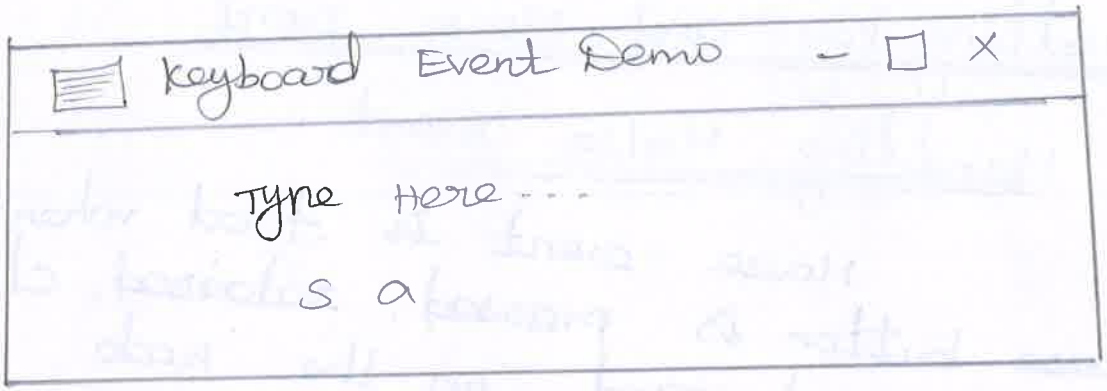
The Event handler interface is defined as EventHandler<T extends Event>. It contains handle() function for processing the event.

2) The handler object is registered by the source object. The registration methods depend on the event type. For ActionEvent, the method is setOnAction.

Ex:

```
Button button = new Button("click Me");
button.setOnAction(new EventHandler
                   <ActionEvent>()
{
public void handle(ActionEvent event)
...
}
```





Controls

The Graphical user Interface (GUI) is essential part of any window based application.

The interaction between the user and the application program is possible with the help of user interface (UI) controls that are placed on the screen.

Most Commonly used UI controls

Label Button Radio Button

Checkbox Textfield Textarea

Combobox Listview Slider.

Label: The label Control displays simple text on the screen. It's main purpose is to describe other Components such as textfield, textarea, radio button and so on.

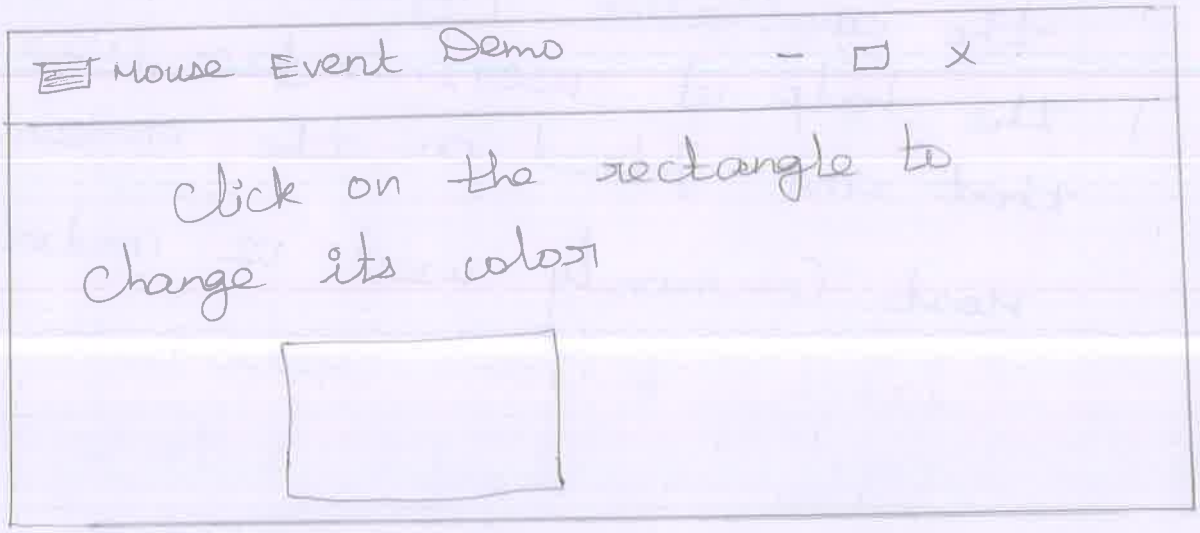
Handling key and Mouse Event

Handling Mouse Event

Mouse event is fired when the mouse button is pressed, released, clicked moved or dragged on the node.

There are 4 Constants - Primary, Secondary, Middle & None are defined as MouseButton to indicate the left, right, middle and none mouse buttons

setOnMouseProssed(EventHandler<MouseEvent>)



Keyboard Events

When any key on the keyboard is pressed, released or typed on a node then the keyboard event occurs.

setOnKeyPressed(EventHandler<KeyEvent>)

User Action

1. key pressed 2. key released 3. key typed

→ For recognizing the keyboard events we use keyEvent class.

Various Methods of keyEvent class are as described in the following.

1. String getCharacter()
2. keyCode getCode()
3. String getText()
4. boolean isAltDown()
5. boolean isControlDown()
6. boolean isMetaDown()
7. boolean isShiftDown().

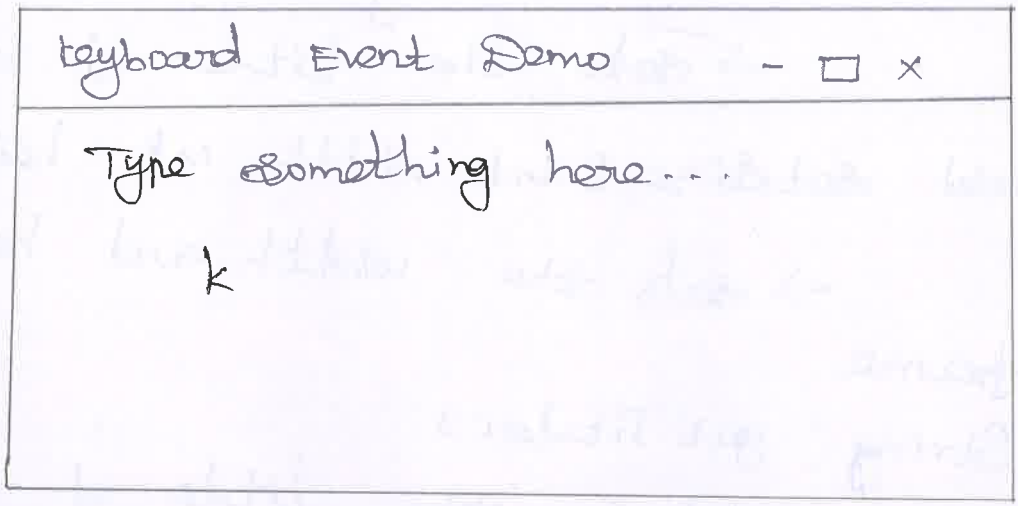
The keycodes returned by the getCode() method are Constants.

Constants	Associated key
HOME	The Home key
END	The End key
CONTROL	The Control key
SHIFT	The Shift key
PAGE-UP	The Page up key
PAGE-DOWN	The Page Down key
ESCAPE	The escape key

Program:

```
package myjavafxapplication;
import javafx.application.Application;
import javafx.event.EventHandler;
import javafx.scene.Group;
import javafx.scene.Scene;
import javafx.scene.input.MouseEvent;
import javafx.scene.text.Font;
import javafx.scene.text.Font;
import javafx.scene.text.FontWeight;
import javafx.scene.text.Text;
import javafx.stage.Stage;
public class MyJavaFxApplication extends
                                    Application
{
@override
public void start(Stage primaryStage)
{
Text msg = new Text(20,20,"Type something
                                    here");
Text text = new Text(50,50," ");
text.setFont(Font.font("Arial", FontWeight.
                                    BOLD, 30));
  text.setText(e.getText());
});
  Group root = new Group(msg, text);
  Scene scene = new Scene(root, 300, 200);
  primaryStage.setScene(Scene);
  PrimaryStage.setTitle("KeyBoard Event Demo");
  PrimaryStage.show();
```

```
    text.requestFocus();
}
public static void main (String[] args)
{
    launch (args);
}}
```



Frames:

-> Frame is a standard graphical window

-> The frame can be displayed using the Frame class.

-> The frame drawn using this class has standard minimize, maximize and close buttons.

Syntax of frame: i) Frame()

This creates the new instance of frame which is invisible initially.

ii) Frame (String title)

This creates the new instance of frame which has some title.

Frame class Methods:

1. void setResizable (boolean resizable)
   → sets frame to resizable
2. void setTitle (String Title)
   → sets the title of the frame.
3. void setSize (int width, int height)
   → sets the width and height of frame
4. String getTitle()
   → obtains the title of the frame.
5. void setVisible (boolean visible)
   → set the frame visible or not.

A frame can be created by two ways.

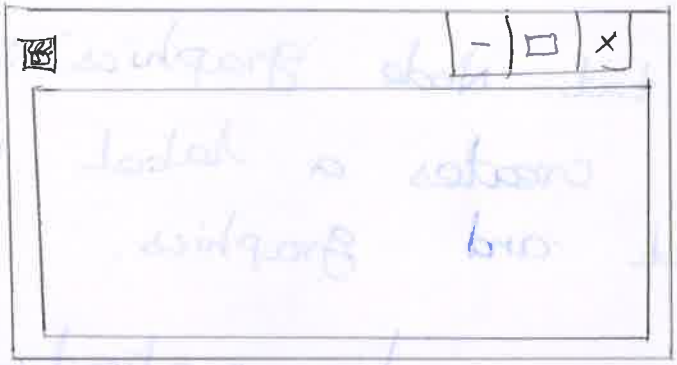
1. By extending the frame class.
2. By creating an instance of a frame class.

1. Create a java Frame by extending the Frame class.

```
import java.awt.*;
class FrameDemo extends Frame
{
public static void main(String[] args)
{
```

```
FrameDemo fr = new FrameDemo();
fr.setSize(300, 300);
fr.setVisible(true);
}}
```

output



Controls:

→ The GUI (Graphical User Interface) is an essential part of any window based application.

→ JavaFx allows its developer a rich set of UI controls.

Control:

1. Label
2. Button
3. RadioButton
4. checkBox
5. TextField
6. Textarea
7. ComboBox
8. ListView
9. Slider.

Label:

→ The label Control displays simple text on the screen.

The constructors used for using Label Control is

Label():

This creates an empty label.

Label(String txt):

This creates a label with supplied text.

Label(String txt, Node graphics):

It creates a label with supplied text and graphics.

```
import javafx.application.Application;
import static javafx.application.Application.
                                    launch;
import javafx.event.ActionEvent;
import javafx.scene.Scene;
import javafx.scene.layout.Stackpane;
import javafx.stage.Stage;
public class MyJavaFxApplication extends
Application
 {
 @override
 public void start(Stage PrimaryStage)
{
Label L = new Label("Username");
Scene Scene = new Scene(root,250,250);
root.getChildren().add(L);
```

```
primaryStage.setTitle("Label Demo");
primaryStage.setScene(scene);
primaryStage.show();
}
public static void main(String[] args)
{
launch(args);
}}
```

User name

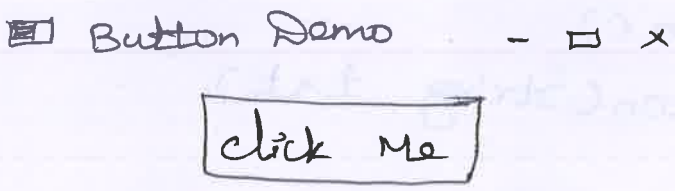
Button

The button Control, Controls the behavior of the application. Some event gets generated when a button is clicked.

The button control is created by

```
Button btn = new Button("click Here");
```

For using the button Control we need to import the package javafx.scene.Control.Button.

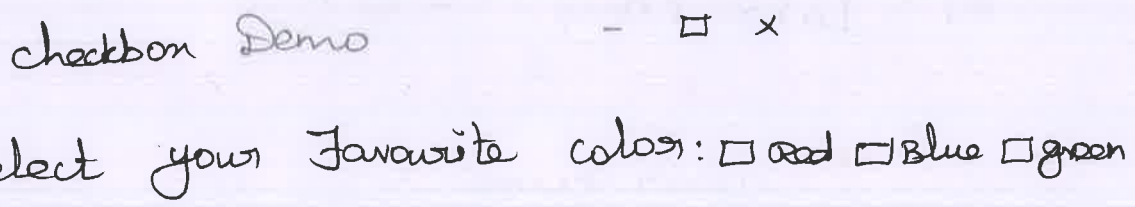


CheckBox:

checkbox is used to provide more than one choices at a time.

For using checkbox application, we must insert the following line in the program at the beginning.

```
import javafx.scene.control.CheckBox
CheckBox ch = new CheckBox("Label Name");
```



Toggle Button:

→ Toggle Button is a button control that has two states selected (or) deselected

→ The ToggleButtons are placed in a ToggleGroup. From the same group at the most only one button is selected at a time.

If one button is selected from that group then other buttons of that group remain deselected.

Constructors:

1. ToggleButton()
2. ToggleButton(String txt)

Methods:

1. setToggleGroup (ToggleGroup val)
2. setSelected (boolean val):
3. isSelected ()

RadioButtons

The Radio button Control is used to make a choice.

The difference between checkbox and radio button is that with checkbox we can have more than one selection but with radio button we select only one option at a time.

```
RadioButton radioButton1 = new RadioButton
                           ("Label");
```

RadioButton Demo - □ ×

select your favourite color:

- ○ Red
- ◉ Blue
- ○ Green
- ○ yellow

TextField

TextField control allows the user to enter the text that can be read by the application.

package: javafx.scene.control.TextField need to be imported for using the TextField control.

Text Field Demo - □ x

Enter Name [ARUN]

Text Area :

The TextArea Control allows to enter multiline text. This control is represented by the class javafx.scene.control.TextArea

```
TextArea ta = new TextArea()
```

The TextArea using setPrefHeight() & setPrefWidth() functions

Text Area Demo - □ x

Enter your Comments : product is excellent
but it costly
Improve packaging

List view

The JavaFx Listview Control enables user to choose one or more options from a predefined list of choices.

The JavaFx Listview Control is represented by the class javafx.scene.Control.ListView.

The Listview can be created as follows

ListView listview = new Listview()

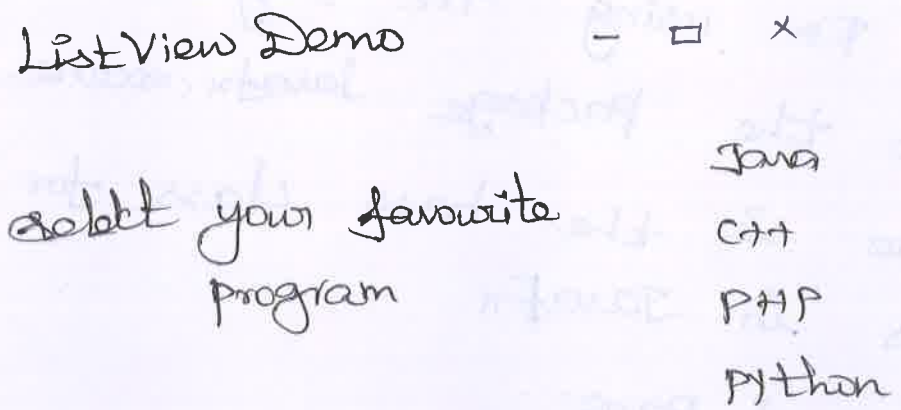
The items can be added to the Listview Control using

getItems().add() method.

Ex:

listview.getItems().add("Item 1");

listview.getItems().add("Item 2");



Combo Box:

We can have predefined list of choices using Combo box.

This control is represented by javafx.scene.control.ComboBox class.

ComboBox cb = new ComboBox();

Then we need to add the list of choices to the ComboBox. This can be done using

cb.getItems().add("option 1")

cb.getItems().add("option 2")

ComboBox Demo — □ ×

select your favourite Programming language

Layouts:

The arrangement of various Components in a Scene within the Container is called Layout of the Container

For using the layout we must import the package javafx.scene.layout.

Pane is the base class for all the layouts in JavaFx.

Layout Pane

1. HBox 2. VBox 3. StackPane 4. GridPane
5. FlowPane 6. BorderPane.

Flowpane:

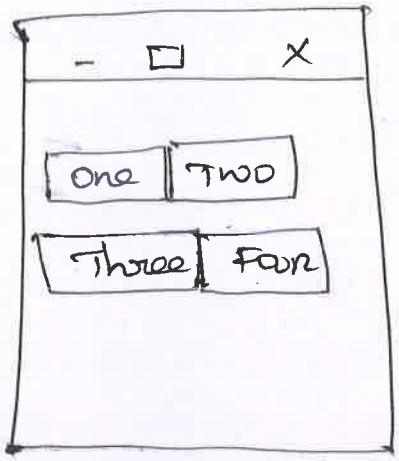
1. JavaFx Flowpane is a layout Component which lays out its child components either vertically or horizontally

Methods:

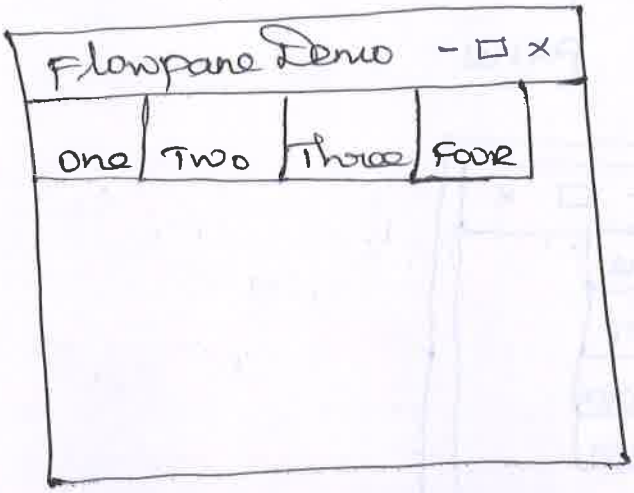
object property <POS> alignment

object property <HPOS> columnHalignment

object property <VPOS> rowValignment



Initially we get this window



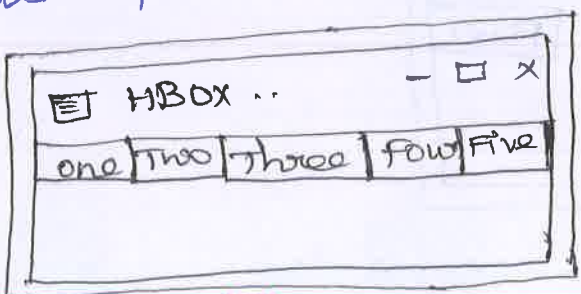
If we expand the window horizontally, the buttons get arranged horizontally automatically

HBOX

-> The HBox layout arranges the children in the form of horizontal rows.

-> HBOX class extends pane class.

-> It requires javafx.scene.layout.HBox class which provides all the required method of this pane.

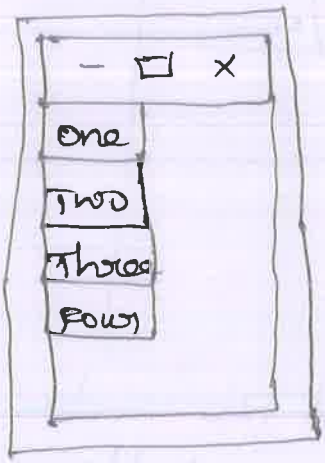


VBox

-> The VBox layout arranges the children in the form of vertical rows.

-> The VBox class extends Pane class.

-> It requires javafx.scene.layout.VBox class which provides all the required methods of this pane.

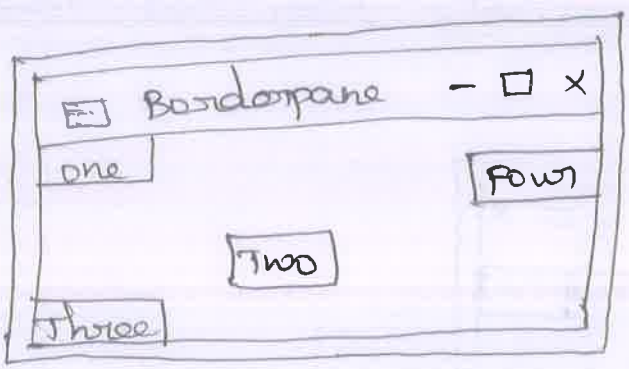


Borderpane:

-> Borderpane layout children in top, left, right, bottom and center positions.

-> It can be used to create the classic looking application layouts

-> It is represented by javafx.scene.layout.BorderPane class.



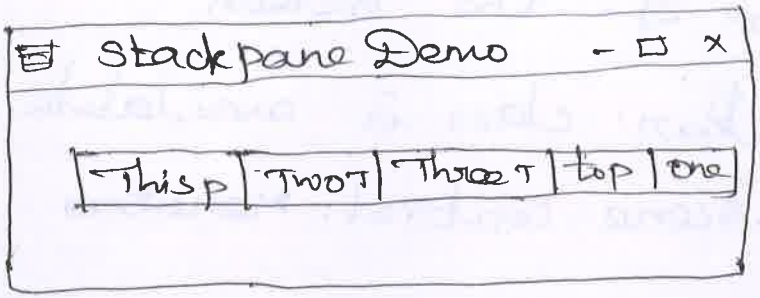
Stackpane:

→ Stackpane is a layout in which every new node is placed on the top of previous node.

→ It makes use of javafx.scene.layout.Stackpane class.

The constructor for Stackpane layout is

1. StackPane()
2. Stackpane (Node ... children)



Grid pane:

→ Gridpane places its nodes into a grid of rows and columns.

→ Nodes may span multiple rows (or) columns. Gridpane is the most flexible built-in layout pane.

Button 1	Button 2
Button 3	Button 4
Button 5	Button 6

Menus

→ In JavaFx we can create a menu using a Menu class.

→ For using the Menu class in our JavaFx application we need to import

javafx.scene.control.Menu

Menu Bars

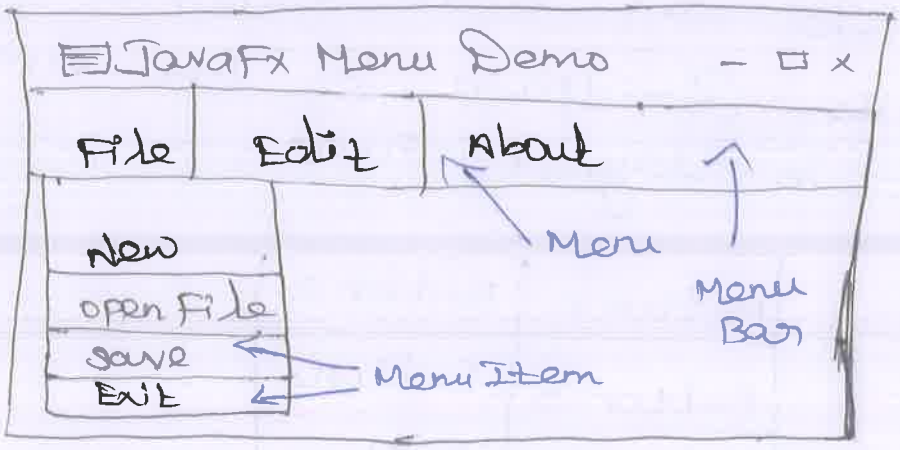
→ MenuBar is just like a navigation bar with menus on it. The menubar is located at the top of the screen.

→ The MenuBar class is available

javafx.scene.control.MenuBar Package.

MenuItem

→ A MenuItem is a basic item that goes on a menu.



U-V

JAVAFX Event Handling Controls and Components

PART-A 2 Marks

1. What is JavaFX?
2. What are the various features of JavaFX?
3. Is JAVAFX is open source?
4. what are the main components of JavaFx application?
5. which method is used to launch JAVAFX application?
6. what is Event.
7. what is event source object?
8. Explain the terms - Event handler and Event listener.
9. what is layoutpane?
10. Explain any two UI controls used in JavaFx application.
11. Explain the terms - Menubar & Menu Item.
12. what is stage in JavaFx?
13. Define property Binding in JavaFx?

PART - B

1. Explain the Basic structure of JAVAFx. (8M)
2. What are the Features of JAVAFx and Sketch the Major Components of JAVAFx Application. (16M)
3. Explain Panes and UI Controls with suitable program with output. (8M)
4. How to Handle the Mouse Event. Explain with suitable output Program. (8M)
5. How to Handle the keyboard Event, explain with suitable program. (8M)
6. Explain briefly about Controls in JavaFx. (16M)
   i) Label ii) Button iii) RadioButton
   iv) TextField v) Text Area vi) Checkbox
7. List and explain the layouts in JavaFx. (16M)
8. Explain briefly about Menus in JavaFx. (16M)
   1. Menu 2. MenuBars 3. MenuItem

Verified

REFERENCES:

1. Cay S. Horstmann, "core Java Fundamentals", volume 1, 11th Edition, prentice Hall, 2018

2. Matt weisfield "The object-oriented Thought Process" "Fourth Edition".

3. https://www.Javatpoint.Com

4. https://www.tutorialpoint.com

5. https://www.gatevidylay.com

6. https://padeepz.com

7. https://scalar.com

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B.TECH IT STUDENT NAMELIST

II YEAR/ III SEM

S.NO	REGISTER NO	NAME OF THE STUDENT
1	731221205003	BHUVANESWARAN M
2	731221205004	BOOPATHI C
3	731221205005	DEVIKA A
4	731221205006	DHANALAKSHMI C
5	731221205007	DHARSHINI P
6	731221205008	DHAYALAN R
7	731221205009	DINESH M
8	731221205010	DIVYA S
9	731221205011	KARTHICKRAJA G
10	731221205012	KAVIBHARATHI G
11	731221205013	KOWSALYA G
12	731221205015	KRISHNAN S
13	731221205016	MADHANKUMAR N
14	731221205017	MAHADEVAMMA S
15	731221205019	MANIGANDAN M
16	731221205020	MANILA K
17	731221205021	MANOJKUMAR S
18	731221205022	MAVURIYA D
19	731221205023	MEGALATHANGAMANI M

20	731221205026	MOTHIR L
21	731221205027	MOUNASAKTHI G
22	731221205028	NANDHINI S
23	731221205029	NAVEEN S
24	731221205030	PANDEESWARAN C K
25	731221205031	PARTHIBAN M
26	731221205032	RAKSHITHA B
27	731221205033	RATHNA R
28	731221205034	RAVIKUMAR M
29	731221205035	RITHIK S
30	731221205036	ROHITH V
31	731221205037	SHARANKUMAR M V
32	731221205038	SIDDAPPA S
33	731221205039	SUNDHARESWARI V
34	731221205040	SUYAMBURAJ C
35	731221205041	SWETHA S
36	731221205042	TAMILSELVAN M
37	731221205044	YUSWANTHRAA R
38	731221205301	AHALYA J C

FACULTY INCHARGE

HOD

CS3391 OBJECT ORIENTED PROGRAMMING L T P C

3 0 0 3

COURSE OBJECTIVES:

- To understand Object Oriented Programming concepts and basics of Java programminglanguage
- To know the principles of packages, inheritance and interfaces
- To develop a java application with threads and generics classes
- To define exceptions and use I/O streams
- To design and build Graphical User Interface Application using JAVAFX

UNIT I INTRODUCTION TO OOP AND JAVA 9

Overview of OOP – Object oriented programming paradigms – Features of Object Oriented Programming – Java Buzzwords – Overview of Java – Data Types, Variables and Arrays – Operators – Control Statements – Programming Structures in Java – Defining classes in Java – Constructors-Methods -Access specifiers - Static members- JavaDoc comments

UNIT II INHERITANCE, PACKAGES AND INTERFACES 9

Overloading Methods – Objects as Parameters – Returning Objects –Static, Nested and Inner Classes. Inheritance: Basics– Types of Inheritance -Super keyword - Method Overriding – Dynamic Method Dispatch –Abstract Classes – final with Inheritance. Packages and Interfaces: Packages – Packages and Member Access –Importing Packages – Interfaces.

UNIT III EXCEPTION HANDLING AND MULTITHREADING 9

Exception Handling basics – Multiple catch Clauses – Nested try Statements – Java's Built-in Exceptions – User defined Exception. Multithreaded Programming: Java Thread Model–Creating a Thread and Multiple Threads – Priorities – Synchronization – Inter Thread Communication- Suspending –Resuming, and Stopping Threads –Multithreading. Wrappers – Auto boxing.

UNIT IV I/O, GENERICS, STRING HANDLING 9

I/O Basics – Reading and Writing Console I/O – Reading and Writing Files. Generics: Generic Programming – Generic classes – Generic Methods – Bounded Types – Restrictions and Limitations. Strings: Basic String class, methods and String Buffer Class..

UNIT V JAVAFX EVENT HANDLING, CONTROLS AND COMPONENTS 9

JAVAFX Events and Controls: Event Basics – Handling Key and Mouse Events. Controls: Checkbox, ToggleButton – RadioButtons – ListView – ComboBox – ChoiceBox – Text Controls – ScrollPane. Layouts – FlowPane – HBox and VBox – BorderPane – StackPane – GridPane. Menus – Basics – Menu – Menu bars – MenuItem.

COURSE OUTCOMES:

On completion of this course, the students will be able to

CO1: Apply the concepts of classes and objects to solve simple problems

CO2: Develop programs using inheritance, packages and interfaces

CO3: Make use of exception handling mechanisms and multithreaded model to solve real worldproblems

CO4: Build Java applications with I/O packages, string classes, Collections and generics concepts **CO5:**Integrate the concepts of event handling and JavaFX components and controls for developingGUI based applications

TOTAL:45PERIOS

TEXT BOOKS:

1. Herbert Schildt, "Java: The Complete Reference", 11 th Edition, McGraw Hill Education, NewDelhi, 2019
2. Herbert Schildt, "Introducing JavaFX 8 Programming", 1 st Edition, McGraw Hill Education, NewDelhi, 2015

REFERENCE:

1. Cay S. Horstmann, "Core Java Fundamentals", Volume 1, 11 th Edition, Prentice Hall, 2018.

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DEPARTMENT OF INFORMATION TECHNOLOGY

LESSON PLAN

FACULTY NAME	:	**P.SANGEETHA**
DESIGNATION	:	**AP/IT**
SUBJECT CODE / TITLE	:	**CS3391/ OBJECT ORIENTED PROGRAMMING**
BRANCH/SEMEMSTER	:	**IT/III**
YEAR	:	**II**

OBJECTIVES:

- To understand Object Oriented Programming concepts and basics of Java programming language.
- To know the principles of packages, inheritance and interfaces.
- To develop a java application with threads and generics classes.
- To define exceptions and use I/O streams.
- To design and build Graphical User Interface Application using JAVAFX.

HOURS	TOPICS TO BE COVERED	DATE	PERIOD	TEACHING METHODOLOGY	TEACHING AID	REMARKS
UNIT I INTRODUCTION TO OOP AND JAVA						
1	Overview of OOP & Object oriented programming paradigms	22/8/22 23/8/22	4 1,8	LECTURE	BOARD & CHALK	
2	Features of Object Oriented Programming & Java Buzzwords	24/8/22	4	LECTURE	BOARD & CHALK	
3	Overview of Java & Data Types, Variables and Array	27/8/22	8	LECTURE	BOARD & CHALK	

4	Operators	2/9/22	8	LECTURE	BOARD & CHALK	
5	Control Statements	3/9/22	4	LECTURE	BOARD & CHALK	
6	Programming Structures in Java & Defining classes in Java	5/9/22	4	LECTURE	BOARD & CHALK	
7	Constructors & Methods	7/9/22	4	LECTURE	BOARD & CHALK	
8	Access specifiers & Static members	9/9/22	8	LECTURE	BOARD & CHALK	
9	JavaDoc comments	16/9/22	1, 8	LECTURE	BOARD & CHALK	
UNIT II INHERITANCE, PACKAGES AND INTERFACES						
10	Overloading Methods & Objects as Parameters	17/9/22	4	LECTURE	BOARD & CHALK	
11	Returning Objects & Static, Nested and Inner Classes	19/9/22	4	LECTURE	BOARD & CHALK	
12	Inheritance: Basics & Types of Inheritance	20/9/22	1, 8	LECTURE	BOARD & CHALK	
13	Super keyword & Method Overriding	23, 24/9/22	8	LECTURE	BOARD & CHALK	
14	Dynamic Method Dispatch & Abstract Classes	26/9/22	4	LECTURE	BOARD & CHALK	
15	Final with Inheritance & Packages and Interfaces	27/9/22	1, 8	LECTURE	BOARD & CHALK	

16	Packages & Packages and Member Access	8/10/22	4	LECTURE	BOARD & CHALK	
17	Importing Packages	11/10/22	1,8	LECTURE	BOARD & CHALK	
18	Interfaces	12/10/22	4	LECTURE	BOARD & CHALK	
UNIT III EXCEPTION HANDLING AND MULTITHREADING						
19	Exception Handling basics & Multiple catch Clauses	14/10/22 15/10/22	8 1,8	LECTURE	BOARD & CHALK	
20	Nested try Statements	17/10/22	4	LECTURE	BOARD & CHALK	
21	Java's Built-in Exceptions & User defined Exception	18/10/22	1,8	LECTURE	BOARD & CHALK	
22	Multithreaded Programming: Java Thread Model	19/10/22	4	LECTURE	BOARD & CHALK	
23	Creating a Thread and Multiple Threads	26/10/22	4	LECTURE	BOARD & CHALK	
24	Priorities & Synchronization	28/10/22	8	LECTURE	BOARD & CHALK	
25	Inter Thread Communication	29/10/22	4	LECTURE	BOARD & CHALK	
26	Suspending & Resuming, and Stopping Threads	29/10/22	4	LECTURE	BOARD & CHALK	

27	Multithreading & Wrappers & Auto boxing.	31/10/22	4	LECTURE	BOARD & CHALK	
UNIT IV I/O, GENERICS, STRING HANDLING						
28	I/O Basics	4/11/22	8	LECTURE	BOARD & CHALK	
29	Reading and Writing Console I/O	7/11/22	4	LECTURE	BOARD & CHALK	
30	Reading and Writing Files	8/11/22	1/8	LECTURE	BOARD & CHALK	
31	Generics: Generic Programming	9/11/22	4	LECTURE	BOARD & CHALK	
32	Generic classes & Generic Methods	10/11/22	8	LECTURE	BOARD & CHALK	
33	Bounded Types	11/11/22	4	LECTURE	BOARD & CHALK	
34	Restrictions and Limitations	14/11/22	4	LECTURE	BOARD & CHALK	
35	Strings: Basic String class,	16/11/22	1/8	LECTURE	BOARD & CHALK	
36	Methods and String Buffer Class	18/11/22	8	LECTURE	BOARD & CHALK	
UNIT V JAVAFX EVENT HANDLING, CONTROLS AND COMPONENTS						
37	JAVAFX Events and Controls:Event Basics	22/11/22	1/8	LECTURE	BOARD & CHALK	
38	Handling Key and Mouse Events	23/11/22	4	LECTURE	BOARD & CHALK	

39	Controls: Checkbox & ToggleButton	25/11/22	8	LECTURE	BOARD & CHALK	
40	RadioButtons & ListView	28/11/22	4	LECTURE	BOARD & CHALK	
41	ComboBox & ChoiceBox	29/11/22	1.8	LECTURE	BOARD & CHALK	
42	Text Controls &ScrollPane.	30/11/22	4	LECTURE	BOARD & CHALK	
43	Layouts &FlowPane & HBox andVBox	5/12/22	8	LECTURE	BOARD & CHALK	
44	BorderPane &StackPane & GridPane.	7/12/22	1.4	LECTURE	BOARD & CHALK	
45	MenusBasics & Menu & Menu bars & MenuItem	12,13,14 16,17 /12/22	8,4,1, 4,4,8	LECTURE	BOARD & CHALK	

TEXT BOOK:

1. Herbert Schildt, "Java: The Complete Reference", 11 th Edition, McGraw Hill Education, New Delhi, 2019
2. Herbert Schildt, "Introducing JavaFX 8 Programming", 1 st Edition, McGraw Hill Education, New Delhi, 2015

REFERENCES:

1. Cay S. Horstmann, "Core Java Fundamentals", Volume 1, 11 th Edition, Prentice Hall, 2018.
2. Padeepzhttps://padeepz.net
3. W3Schoolshttps://www.w3schools.com
4. Javatpointhttps://www.javatpoint.com

STAFF IN-CHARGE **HOD** **PRINCIPAL**

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INSTITUTION ACADEMIC CALENDAR

Planned Activity Table

ODD SEMESTER 2022-2023		
S.No	**Planned Activity**	**Date**
1	INTERNAL ASSESSMENT – II (UG IV SEM & PG (MCA, MBA & ME)	9-Jun-22
2	International Yoga Day 2022 conducted by EEE Department / INTERNAL ASSESSMENT – II (UG IV SEM & PG (MCA, MBA & ME)	10-Jun-22
3	INTERNAL ASSESSMENT – II (UG IV SEM & PG (MCA, MBA & ME)	11-Jun-22
4	INTERNAL ASSESSMENT – II (UG II & III Year)	13-Jun-22
5	INTERNAL ASSESSMENT – II (UG II & III Year)	14-Jun-22
6	INTERNAL ASSESSMENT – II (UG II & III Year)	15-Jun-22
7	Commencement of EVEN Semester Classes For PG (ME) I Year II Sem	27-Jun-22
8	INTERNAL ASSESSMENT – III (UG IV SEM & PG (MCA, MBA & ME) / INTERNAL ASSESSMENT – II (UG II SEM	30-Jun-22
9	INTERNAL ASSESSMENT – III (UG IV SEM & PG (MCA, MBA & ME) / INTERNAL ASSESSMENT – II (UG II SEM	1-Jul-22
10	INTERNAL ASSESSMENT – III (UG IV SEM & PG (MCA, MBA & ME) / INTERNAL ASSESSMENT – II (UG II SEM	2-Jul-22
11	INTERNAL ASSESSMENT – I (PG ME II SEM)	5-Aug-22
12	INTERNAL ASSESSMENT – I (PG ME II SEM)	8-Aug-22
13	Commencement of ODD Semester Classes For UG (III Year V Sem & IV Year VII Sem) / INTERNAL ASSESSMENT – I (PG ME II SEM) / 75TH Independence Day	10-Aug-22
14	INTERNAL ASSESSMENT – I (PG ME II SEM)	11-Aug-22
15	INTERNAL ASSESSMENT – I (PG ME II SEM)	12-Aug-22
16	Commencement of ODD Semester Classes For UG (II Year III Sem)	22-Aug-22
17	NATIONAL PHOTOGRAPHY DAY Conducted By Photography Club / Civil Department	24-Aug-22
18	FINE ARTS CLUB Inauguration Conducted By CSE & IT Department	27-Aug-22
19	Commencement of ODD Semester Classes For MBA III Sem	1-Sep-22
20	INTERNAL ASSESSMENT – II (PG ME II SEM) / INTERNAL ASSESSMENT – I (UG III Year & IV Year)	26-Sep-22

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S.No	Planned Activity	Date
21	INTERNAL ASSESSMENT – II (PG ME II SEM) / INTERNAL ASSESSMENT – I (UG III Year & IV Year)	27-Sep-22
22	INTERNAL ASSESSMENT – II (PG ME II SEM) / INTERNAL ASSESSMENT – I (UG III Year & IV Year)	28-Sep-22
23	INTERNAL ASSESSMENT – II (PG ME II SEM)	29-Sep-22
24	INTERNAL ASSESSMENT – II (PG ME II SEM)	30-Sep-22
25	INTERNAL ASSESSMENT – I (UG II Year III Sem) / POSTER MAKING COMPETITION Conducted By ELECTORAL LITERACY CLUB / EEE Department / Commencement of ODD Semester Classes For PG (ME & MBA I Year)	10-Oct-22
26	INTERNAL ASSESSMENT – I (UG II Year III Sem)	11-Oct-22
27	INTERNAL ASSESSMENT – I (UG II Year III Sem)	12-Oct-22
28	INTERNAL ASSESSMENT – I (UG II Year III Sem)	13-Oct-22
29	INTERNAL ASSESSMENT – I (UG II Year III Sem)	14-Oct-22
30	INTERNAL ASSESSMENT – I (UG II Year III Sem)	15-Oct-22
31	INTERNAL ASSESSMENT – I (PG MBA II Year III Sem) / Commencement of ODD Semester Classes For PG (MCA I Year & II Year)	19-Oct-22
32	INTERNAL ASSESSMENT – II (UG III Year & IV Year) / INTERNAL ASSESSMENT – I (PG MBA III Sem)	20-Oct-22
33	INTERNAL ASSESSMENT – II (UG III Year & IV Year) / INTERNAL ASSESSMENT – I (PG MBA III Sem)	21-Oct-22
34	INTERNAL ASSESSMENT – II (UG III Year & IV Year) / INTERNAL ASSESSMENT – I (PG MBA III Sem)	26-Oct-22
35	WOMEN'S EMPOWERMENT PROGRAMME Conducted By WEC Club	4-Nov-22
36	INTERNAL ASSESSMENT – III (UG III Year & IV Year)	17-Nov-22
37	INTERNAL ASSESSMENT – III (UG III Year & IV Year)	18-Nov-22
38	INTERNAL ASSESSMENT – III (UG III Year & IV Year)	19-Nov-22
39	Commencement of Practical Examinations for UG III Year & IV Year	21-Nov-22
40	INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E) / Commencement of ODD Semester Classes For UG I Year	28-Nov-22
41	INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)	29-Nov-22

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S.No	Planned Activity	Date
42	INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)	30-Nov-22
43	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)	1-Dec-22
44	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)	2-Dec-22
45	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I & II Year MCA)	5-Dec-22
46	INTERNAL ASSESSMENT – II (UG II Year III Sem) / Last Working Day for UG III Year & IV Year / INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	6-Dec-22
47	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	7-Dec-22
48	INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	8-Dec-22
49	INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	9-Dec-22
50	INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	10-Dec-22
51	Commencement of ODD Semester Classes For PG (ME II Year III SEM)	12-Dec-22
52	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)	14-Dec-22
53	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)	15-Dec-22
54	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)	16-Dec-22
55	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)	17-Dec-22
56	Last Working Day For MBA II Year	19-Dec-22
57	Last Working Day For UG (II Year)	27-Dec-22
58	Commencement of Practical Examinations For UG II YEAR & PG MBA II YEAR	19-Jan-23
59	INTERNAL ASSESSMENT – I (UG I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	20-Jan-23
60	INTERNAL ASSESSMENT – I (UG I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	21-Jan-23
61	INTERNAL ASSESSMENT – I (UG I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	23-Jan-23
62	INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	24-Jan-23

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INSTITUTION ACADEMIC CALENDAR
Adherence Activity Table

ODD SEMESTER 2022-2023				
S.No	**Planned Activity**	**Date**	**Adhered / Not Adhered**	**Reason for Postponement /Adhered Date**
1	INTERNAL ASSESSMENT – II (UG IV SEM & PG (MCA, MBA & ME)	09-Jun-22	Adhered	
2	International Yoga Day 2022 conducted by EEE Department / INTERNAL ASSESSMENT – II (UG IV SEM & PG (MCA, MBA & ME)	10-Jun-22	Adhered	
3	INTERNAL ASSESSMENT – II (UG IV SEM & PG (MCA, MBA & ME)	11-Jun-22	Adhered	
4	INTERNAL ASSESSMENT – II (UG II & III Year)	13-Jun-22	Adhered	
5	INTERNAL ASSESSMENT – II (UG II & III Year)	14-Jun-22	Adhered	
6	INTERNAL ASSESSMENT – II (UG II & III Year)	15-Jun-22	Adhered	
7	Commencement of EVEN Semester Classes For PG (ME) I Year II Sem	27-Jun-22	Adhered	
8	INTERNAL ASSESSMENT – III (UG IV SEM & PG (MCA, MBA & ME) / INTERNAL ASSESSMENT – II (UG II SEM	30-Jun-22	Adhered	
9	INTERNAL ASSESSMENT – III (UG IV SEM & PG (MCA, MBA & ME) / INTERNAL ASSESSMENT – II (UG II SEM	01-Jul-22	Adhered	
10	INTERNAL ASSESSMENT – III (UG IV SEM & PG (MCA, MBA & ME) / INTERNAL ASSESSMENT – II (UG II SEM	02-Jul-22	Adhered	
11	INTERNAL ASSESSMENT – I (PG ME II SEM)	05-Aug-22	Adhered	
12	INTERNAL ASSESSMENT – I (PG ME II SEM)	08-Aug-22	Adhered	
13	Commencement of ODD Semester Classes For UG (III Year V Sem & IV Year VII Sem) / INTERNAL ASSESSMENT – I (PG ME II SEM) / 75TH Independence Day 2022 conducted by LITERARY CLUB	10-Aug-22	Adhered	

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S.No	Planned Activity	Date	Adhered / Not Adhered	Reason for Postponement /Adhered Date
14	INTERNAL ASSESSMENT – I (PG ME II SEM)	11-Aug-22	Adhered	
15	INTERNAL ASSESSMENT – I (PG ME II SEM)	12-Aug-22	Adhered	
16	Commencement of ODD Semester Classes For UG (II Year III Sem)	22-Aug-22	Adhered	
17	NATIONAL PHOTOGRAPHY DAY Conducted By Photography Club / Civil Department	24-Aug-22	Adhered	
18	FINE ARTS CLUB Inauguration Conducted By CSE & IT Department	27-Aug-22	Adhered	
19	Commencement of ODD Semester Classes For MBA III Sem	01-Sep-22	Adhered	
20	INTERNAL ASSESSMENT – II (PG ME II SEM) / INTERNAL ASSESSMENT – I (UG III Year & IV Year)	26-Sep-22	Adhered	
21	INTERNAL ASSESSMENT – II (PG ME II SEM) / INTERNAL ASSESSMENT – I (UG III Year & IV Year)	27-Sep-22	Adhered	
22	INTERNAL ASSESSMENT – II (PG ME II SEM) / INTERNAL ASSESSMENT – I (UG III Year & IV Year)	28-Sep-22	Adhered	
23	INTERNAL ASSESSMENT – II (PG ME II SEM)	29-Sep-22	Adhered	
24	INTERNAL ASSESSMENT – II (PG ME II SEM)	30-Sep-22	Adhered	
25	INTERNAL ASSESSMENT – I (UG II Year III Sem) / POSTER MAKING COMPETITION Conducted By ELECTORAL LITERACY CLUB / EEE Department / Commencement of ODD Semester Classes For PG (ME & MBA I Year)	10-Oct-22	Adhered	
26	INTERNAL ASSESSMENT – I (UG II Year III Sem)	11-Oct-22	Adhered	
27	INTERNAL ASSESSMENT – I (UG II Year III Sem)	12-Oct-22	Adhered	
28	INTERNAL ASSESSMENT – I (UG II Year III Sem)	13-Oct-22	Adhered	
29	INTERNAL ASSESSMENT – I (UG II Year III Sem)	14-Oct-22	Adhered	

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S.No	Planned Activity	Date	Adhered / Not Adhered	Reason for Postponement /Adhered Date
30	INTERNAL ASSESSMENT – I (UG II Year III Sem)	15-Oct-22	Adhered	
31	INTERNAL ASSESSMENT – I (PG MBA II Year III Sem) / Commencement of ODD Semester Classes For PG (MCA I Year & II Year)	19-Oct-22	Adhered	
32	INTERNAL ASSESSMENT – II (UG III Year & IV Year) / INTERNAL ASSESSMENT – I (PG MBA III Sem)	20-Oct-22	Adhered	
33	INTERNAL ASSESSMENT – II (UG III Year & IV Year) / INTERNAL ASSESSMENT – I (PG MBA III Sem)	21-Oct-22	Adhered	
34	INTERNAL ASSESSMENT – II (UG III Year & IV Year) / INTERNAL ASSESSMENT – I (PG MBA III Sem)	26-Oct-22	Adhered	
35	WOMEN'S EMPOWERMENT PROGRAMME Conducted By WEC Club	04-Nov-22	Adhered	
36	INTERNAL ASSESSMENT – III (UG III Year & IV Year)	17-Nov-22	Adhered	
37	INTERNAL ASSESSMENT – III (UG III Year & IV Year)	18-Nov-22	Adhered	
38	INTERNAL ASSESSMENT – III (UG III Year & IV Year)	19-Nov-22	Adhered	
39	Commencement of Practical Examinations for UG III Year & IV Year	21-Nov-22	Adhered	
40	INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E) / Commencement of ODD Semester Classes For UG I Year	28-Nov-22	Adhered	
41	INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)	29-Nov-22	Adhered	
42	INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)	30-Nov-22	Adhered	
43	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)	01-Dec-22	Adhered	
44	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I Year / MBA & M.E)	02-Dec-22	Adhered	
45	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I & II Year MCA)	05-Dec-22	Adhered	

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S.No	Planned Activity	Date	Adhered / Not Adhered	Reason for Postponement /Adhered Date
46	INTERNAL ASSESSMENT – II (UG II Year III Sem) / Last Working Day for UG III Year & IV Year / INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	06-Dec-22	Adhered	
47	INTERNAL ASSESSMENT – II (UG II Year III Sem) / INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	07-Dec-22	Adhered	
48	INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	08-Dec-22	Adhered	
49	INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	09-Dec-22	Adhered	
50	INTERNAL ASSESSMENT – I (PG I & II Year / MCA)	10-Dec-22	Adhered	
51	Commencement of ODD Semester Classes For PG (ME II Year III SEM)	12-Dec-22	Adhered	
52	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)	14-Dec-22	Adhered	
53	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)	15-Dec-22	Adhered	
54	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)	16-Dec-22	Adhered	
55	INTERNAL ASSESSMENT – II (PG MBA II Year III Sem)	17-Dec-22	Adhered	
56	Last Working Day For MBA II Year	19-Dec-22	Adhered	
57	Last Working Day For UG (II Year)	27-Dec-22	Adhered	
58	Commencement of Practical Examinations For UG II YEAR & PG MBA II YEAR	19-Jan-23	Adhered	
59	INTERNAL ASSESSMENT – I (UG I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	20-Jan-23	Adhered	
60	INTERNAL ASSESSMENT – I (UG I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	21-Jan-23	Adhered	
61	INTERNAL ASSESSMENT – I (UG I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	23-Jan-23	Adhered	
62	INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	24-Jan-23	Adhered	

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INSTITUTION ACADEMIC CALENDAR

Planned Activity Table

EVEN SEMESTER 2022-2023		
S.No	**Planned Activity**	**Date**
1	Last Working Day For PG (MBA & M>E I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	25-Jan-23
2	Commencement of Practical Examinations for MBA & M.E I Year / INTERNAL ASSESSMENT – I (PG II Year - M.E)	27-Jan-23
3	INTERNAL ASSESSMENT – I (PG II Year - M.E)	28-Jan-23
4	INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)	30-Jan-23
5	INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)	31-Jan-23
6	Commencement of EVEN Semester Classes For UG (II , III Year & IV Year / IV/VI/VIII - SEM) / INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)	1-Feb-23
7	INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)	2-Feb-23
8	Last Working Day for MCA ODD SEM - I & III / INTERNAL ASSESSMENT – II (PG I & II Year / MCA)	3-Feb-23
9	Commencement of Practical Examinations for MCA I Year & II Year	6-Feb-23
10	SPEECH COMPETITION for World Radio Station Day By ECE Department	13-Feb-23
11	Several Competitions (Singing, Dance & Speech) Conducted by Womens Empowerment Cell	8-Mar-23
12	Short Film Conducted By PHOTOGRAPHY CLUB	10-Mar-23
13	Commencement of EVEN Semester Classes For PG (ME & MBA I Year & MCA II Year)	13-Mar-23
14	INTERNAL ASSESSMENT – II (UG I Year)	16-Mar-23
15	INTERNAL ASSESSMENT – II (UG I Year) / INTERNAL ASSESSMENT – II (PG II Year - M.E)	17-Mar-23
16	INTERNAL ASSESSMENT – II (UG I Year) / INTERNAL ASSESSMENT – II (PG II Year - M.E)	18-Mar-23
17	INTERNAL ASSESSMENT – II (PG II Year - M.E)	20-Mar-23
18	INTERNAL ASSESSMENT – II (PG II Year - M.E)	21-Mar-23
19	Commencement of EVEN Semester Classes For PG (MCA I Year) / INTERNAL ASSESSMENT – I	23-Mar-23
20	INTERNAL ASSESSMENT – I (UG II Year , III Year & IV Year / MBA II Year IV SEM)	24-Mar-23

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S.No	Planned Activity	Date
21	INTERNAL ASSESSMENT – I (UG II Year , III Year & IV Year / MBA II Year IV SEM) / Commencement of Practical Examinations For UG I YEAR & & PG III SEM	25-Mar-23
22	Commencement of Theory Examinations for UG I SEM & PG III SEM	5-Apr-23
23	MASTER HEALTH CHECK UP Conducted By Faculty Welfare Club	13-Apr-23
24	INTERNAL ASSESSMENT – II (UG III Year & IV Year)	19-Apr-23
25	INTERNAL ASSESSMENT – II (UG III Year & IV Year)	20-Apr-23
26	INTERNAL ASSESSMENT – II (UG III Year & IV Year)	21-Apr-23
27	FUNDAMENTALS OF INFORMATION LITERARY Conducted By Womens Empowerment Cell	25-Apr-23
28	Fine Arts Club Conducted By CSE Department	4-May-23
29	YOGA CLASS Conducted By Faculty Welfare Club for all faculty members	5-May-23
30	INTERNAL ASSESSMENT – II (UG II Year/ MBA II Year IV SEM) / INTERNAL ASSESSMENT – III (UG III Year & IV Year)	9-May-23
31	INTERNAL ASSESSMENT – II (UG II Year/ MBA II Year IV SEM) / INTERNAL ASSESSMENT – III (UG III Year & IV Year) / Commencement of EVEN Semester	10-May-23
32	INTERNAL ASSESSMENT – II (UG II Year/ MBA II Year IV SEM) / INTERNAL ASSESSMENT – III (UG III Year & IV Year)	11-May-23
33	Last Working Day for EVEN Semester Classes For UG (II , III Year & IV Year / IV/VI/VIII - SEM)	12-May-23
34	INTERNAL ASSESSMENT – I (PG MCA I Year II SEM) / Commencement of Practical Examinations For UG II, III & IV YEAR	15-May-23
35	INTERNAL ASSESSMENT – I (PG MCA I Year II SEM) / SHORT FILM EVENT Conducted By Photography Club On behalf of "INTERNATIONAL DAY OF LIGHT"/ Faculty Development Program on STRESS MANAGEMENT Conducted By Faculty Welfare Club	16-May-23
36	INTERNAL ASSESSMENT – I (PG MCA I Year II SEM)	17-May-23
37	Seminar on (MICROSOFT OFFICE, OPERATING SYSTEM INSTALLATION & REPAIR) Conducted By Faculty Welfare Club	30-May-23
38	INTERNAL ASSESSMENT – II (PG MCA I Year II SEM) / INTERNAL ASSESSMENT – I (UG I Year II SEM)	26-Jun-23
39	INTERNAL ASSESSMENT – II (PG MCA I Year II SEM) / INTERNAL ASSESSMENT – I (UG I Year II SEM)	27-Jun-23
40	INTERNAL ASSESSMENT – II (PG MCA I Year II SEM) / INTERNAL ASSESSMENT – I (UG I Year II SEM)	28-Jun-23
41	INTERNAL ASSESSMENT – I (UG I Year II SEM)	30-Jun-23

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INSTITUTION ACADEMIC CALENDAR

Adherence Activity Table

EVEN SEMESTER 2022-2023				
S.No	**Planned Activity**	**Date**	**Adhered / Not Adhered**	**Reason for Postponement /Adhered Date**
1	Last Working Day For PG (MBA & M>E I Year) / INTERNAL ASSESSMENT – II (PG I Year / MBA & M.E)	25-Jan-23	Adhered	
2	Commencement of Practical Examinations for MBA & M.E I Year / INTERNAL ASSESSMENT – I (PG II Year - M.E)	27-Jan-23	Adhered	
3	INTERNAL ASSESSMENT – I (PG II Year - M.E)	28-Jan-23	Adhered	
4	INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)	30-Jan-23	Adhered	
5	INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)	31-Jan-23	Adhered	
6	Commencement of EVEN Semester Classes For UG (II , III Year & IV Year / IV/VI/VIII - SEM) / INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)	01-Feb-23	Adhered	
7	INTERNAL ASSESSMENT – II (PG I & II Year / MCA) / INTERNAL ASSESSMENT – I (PG II Year - M.E)	02-Feb-23	Adhered	
8	Last Working Day for MCA ODD SEM - I & III / INTERNAL ASSESSMENT – II (PG I & II Year / MCA)	03-Feb-23	Adhered	
9	Commencement of Practical Examinations for MCA I Year & II Year	06-Feb-23	Adhered	
10	SPEECH COMPETITION for World Radio Station Day By ECE Department	13-Feb-23	Adhered	
11	Several Competitions (Singing, Dance & Speech) Conducted by Womens Empowerment Cell	08-Mar-23	Adhered	
12	Short Film Conducted By PHOTOGRAPHY CLUB	10-Mar-23	Adhered	

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S.No	Planned Activity	Date	Adhered / Not Adhered	Reason for Postponement /Adhered Date
13	Commencement of EVEN Semester Classes For PG (ME & MBA I Year & MCA II Year)	13-Mar-23	Adhered	
14	INTERNAL ASSESSMENT – II (UG I Year)	16-Mar-23	Adhered	
15	INTERNAL ASSESSMENT – II (UG I Year) / INTERNAL ASSESSMENT – II (PG II Year - M.E)	17-Mar-23	Adhered	
16	INTERNAL ASSESSMENT – II (UG I Year) / INTERNAL ASSESSMENT – II (PG II Year - M.E)	18-Mar-23	Adhered	
17	INTERNAL ASSESSMENT – II (PG II Year - M.E)	20-Mar-23	Adhered	
18	INTERNAL ASSESSMENT – II (PG II Year - M.E)	21-Mar-23	Adhered	
19	Commencement of EVEN Semester Classes For PG (MCA I Year) / INTERNAL ASSESSMENT – I (UG II Year / III Year & IV Year / MBA II Year IV SEM) / Last Working Day for UG I SEM & PG III SEM/	23-Mar-23	Adhered	
20	INTERNAL ASSESSMENT – I (UG II Year , III Year & IV Year / MBA II Year IV SEM)	24-Mar-23	Adhered	
21	INTERNAL ASSESSMENT – I (UG II Year , III Year & IV Year / MBA II Year IV SEM) / Commencement of Practical Examinations For UG I YEAR & & PG III SEM	25-Mar-23	Adhered	
22	Commencement of Theory Examinations for UG I SEM & PG III SEM	05-Apr-23	Adhered	
23	MASTER HEALTH CHECK UP Conducted By Faculty Welfare Club	13-Apr-23	Adhered	
24	INTERNAL ASSESSMENT – II (UG III Year & IV Year)	19-Apr-23	Adhered	
25	INTERNAL ASSESSMENT – II (UG III Year & IV Year)	20-Apr-23	Adhered	
26	INTERNAL ASSESSMENT – II (UG III Year & IV Year)	21-Apr-23	Adhered	
27	FUNDAMENTALS OF INFORMATION LITERARY Conducted By Womens Empowerment Cell	25-Apr-23	Adhered	
28	Fine Arts Club Conducted By CSE Department	04-May-23	Adhered	
29	YOGA CLASS Conducted By Faculty Welfare Club for all faculty members	05-May-23	Adhered	

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S.No	Planned Activity	Date	Adhered / Not Adhered	Reason for Postponement /Adhered Date
30	INTERNAL ASSESSMENT – II (UG II Year/ MBA II Year IV SEM) / INTERNAL ASSESSMENT – III (UG III Year & IV Year)	09-May-23	Adhered	
31	INTERNAL ASSESSMENT – II (UG II Year/ MBA II Year IV SEM) / INTERNAL ASSESSMENT – III (UG III Year & IV Year) / Commencement of EVEN Semester Classes For UG (I Year II SEM)	10-May-23	Adhered	
32	INTERNAL ASSESSMENT – II (UG II Year/ MBA II Year IV SEM) / INTERNAL ASSESSMENT – III (UG III Year & IV Year)	11-May-23	Adhered	
33	Last Working Day for EVEN Semester Classes For UG (II , III Year & IV Year / IV/VI/VIII - SEM)	12-May-23	Adhered	
34	INTERNAL ASSESSMENT – I (PG MCA I Year II SEM) / Commencement of Practical Examinations For UG II, III & IV YEAR	15-May-23	Adhered	
35	INTERNAL ASSESSMENT – I (PG MCA I Year II SEM) / SHORT FILM EVENT Conducted By Photography Club On behalf of "INTERNATIONAL DAY OF LIGHT"/ Faculty Development Program on STRESS MANAGEMENT Conducted By Faculty Welfare Club	16-May-23	Adhered	
36	INTERNAL ASSESSMENT – I (PG MCA I Year II SEM)	17-May-23	Adhered	
37	Seminar on (MICROSOFT OFFICE, OPERATING SYSTEM INSTALLATION & REPAIR) Conducted By Faculty Welfare Club	30-May-23	Adhered	
38	INTERNAL ASSESSMENT – II (PG MCA I Year II SEM) / INTERNAL ASSESSMENT – I (UG I Year II SEM)	26-Jun-23	Adhered	
39	INTERNAL ASSESSMENT – II (PG MCA I Year II SEM) / INTERNAL ASSESSMENT – I (UG I Year II SEM)	27-Jun-23	Adhered	
40	INTERNAL ASSESSMENT – II (PG MCA I Year II SEM) / INTERNAL ASSESSMENT – I (UG I Year II SEM)	28-Jun-23	Adhered	
41	INTERNAL ASSESSMENT – I (UG I Year II SEM)	30-Jun-23	Adhered	

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JKKMCT/CIRCULAR/041/SEP-22 **DATE: 22/09/2022**

CIRCULAR

All the UG Degree (B.E/B.Tech) **Second year (III SEMESTER)** students are informed that **First and Second Internal Assessment Scheduled are**

Report No	Report Period	Internal Assessment Date	Report Entry last date
FIRST	22-08-2022 to 15-10-2022	10,11,12,13,14-10-2022 & 15-10-2022	20-10-2022
SECOND	17-10-2022 to 08-12-2022	01, 02, 03-12-2022 & 05, 06, 07-12-2022	09-12-2022

All the subject handlers are informed that should **produce Two Set of Question papers** (Maximum marks 100) in Examcell within two days before the exam date.

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22/9/22

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JKKMCT/CIRCULAR/042/SEP-22 **DATE: 22/09/2022**

CIRCULAR

All the UG Degree (B.E/B.Tech) **3rd Year & Final year** students are informed that **First, Second & Third Internal Assessment Scheduled are,**

Report No	Report Period	Internal Assessment Date	Report Entry last date
FIRST	10-08-2022 to 23-08-2022	-	29-09-2022
SECOND	24-08-2022 to 21-09-2022	26, 27, 28-09-2022	05-10-2022
THIRD	22-09-2022 to 21-10-2022	20, 21, 22-10-2022	28-10-2022
FOUR	22-10-2022 to 19-11-2022	17, 18, 19-11-2022	21-11-2022

All the subject handlers are informed that should **produce Two Set of Question papers** (Maximum marks 50) in Examcell within two days before the exam date.

PRINCIPAL 22/9/22

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JKKMCT/EC/61/2022 **DATE: 03.10.2022**

CIRCULAR

FIRST INTERNAL EXAMINATION - INSTRUCTIONS

First Internal examination for II year will be conducted from 10.10.2022 (Monday) to 14.10.2022 (Friday). All the faculty members handling subjects for III semester are requested to submit the question bank through their respective HOD/Exam cell in charge on or before 07.10.2022 (Friday).

SYLLABUS:FIRST 2.5 UNITS ONLY

Important Instructions regarding Question Paper setting:

- Faculties handling the subjects are requested to submit the common Question Bank.
- II year AUTO, CIVIL,CSE&IT,ECE,EEE & MECH
- File name of the question bank is to be saved as [year] [dept] [subcode] [QB] [Int].pdf

  Example:II_CIVIL_MA8351_QB_Int 1.pdf

  NOTE;
- Exam cell in charges are requested to act their respective department question as per the following schedule.

S.NO	DATE	DEPARTMENT	TIME
1	07.10.2022	AUTO,MECH,CIVIL CSE,IT EEE,ECE	09.30AM to 12.30PM

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Dear Sir/Madam,

First Internal Assessment for II year will be conducted during 10.10.2022(Monday) to 14.10.2022(Friday).

Syllabus: 2.5 Units

Duration: 3.00 Hrs

Maximum Marks:100

- Faculties are requested to submit the question papers to the respective department HOD as per the format attached.
- The last date to submit question paper and answer key is 07.10.2022(Friday).
- The file name of the question is to be saved as [year][dept][subcode].pdf
- Example: II_CIVIL_MA8353_Set1, II_CIVIL_MA8353_Set2
- Late submission of question paper and answer key is not entertained.

Important Instruction Regarding Question Paper Setting:

- All the faculties are instructed to submit the question paper preferably within a single A4 page following the format enclosed.
- All the faculties are instructed to submit the question paper as per the prescribed format only(kindly find the attachment from the mail) & mention the session with date in the question paper.(Example:10.10.2022 - 9.30AM)
- All first year subject handling staff members are requested to submit the common question paper.

EXAM CELL

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J K K MUNIRAJAH COLLEGE OF TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

INTERNAL ASSESSMENT - I SCHEDULE - OCTOBER - 2022

II - YEAR IT

EXAM TIMING – FN: 9.30 AM TO 12.30 PM

S.NO	DATE	DAY	SUBJECT CODE / NAME	STAFF SIGNATURE
			FN	
1	10.10.2022	MONDAY	MA3354 DM	
2	11.10.2022	TUESDAY	CS3352 FDS	
3	12.10.2022	WEDNESDAY	CD3291 DSA	
4	13.10.2022	THURSDAY	CS3391 OOPS	
5	14.10.2022	FRIDAY	CS3351 DPCO	
			TUTOR SIGNATURE	

EXAM CELL INCHARGE **HOD** **PRINCIPAL**

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY, T.N. PALAYAM, GOBI-638506

DEPARTMENT OF INFORMATION TECHNOLOGY

INTERNAL ASSESSMENT - I OCTOBER 2022

FACULTY DUTY CHART

S.NO	STAFF NAME	10.10.2022	11.10.2022	12.10.2022	13.10.2022	14.10.2022	SIGNATURE
1	S.SAMYUKTHA	*					
2	N.NAVINDRAN		*				
3	S.KANIMOZHI				*		
4	P.SANGEETHA			*			
5	E.VIJAY ANANTH					*	
6	S.PRIYA						
7	V.KALAIVENDHAN		*				
8	K.R.VIKNESHWARA					*	
9	D.NIVETHINI			*			
10	S.SUDHAKAR	*					
11	A.SAMBATHKUMAR				*		

Note:

1.Staff who going for exam duty must present at 9.45 AM for FN and 2.15 PM for AN.
2.Students should not be allowed to leave te hall before 11.30 AM for FN and 4.00 PM for AN
3.Students should not be allowed to write exam without ID card.
4.Students are not permitted to get anything from anybody inside exam hall.

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JKK MUNIRAJAH COLLEGE OF TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
II-IT / III SEM
INTERNAL ASSESMENT I

SUB CODE :CS3391 SUB NAME :OBJECT ORIENTED PROGRAMMING

S.NO	REGISTER NUMBER	NAME	INTERNAL MARKS(100)	INTERNAL MARKS(60)	ASSIGNMENT MARKS (40)	TOTAL (100)
1	731221205003	BHUVANESHWARAN M	40	24	36	60
2	731221205004	BOOPATHI C	52	31.2	38	69
3	731221205005	DEVIKA A	52	31.2	37	68
4	731221205006	DHANALAKSHMI C	7	4.2	37	41
5	731221205007	DHARSHINI P	5	3	37	40
6	731221205008	DHAYALAN R	28	16.8	37	54
7	731221205009	DINESH M	10	6	38	44
8	731221205010	DIVYA S	37	22.2	36	58
9	731221205011	KARTHICKRAJA G	2	1.2	38	39
10	731221205012	KAVIBHARATHI G	64	38.4	36	74
11	731221205013	KOWSALYA G	17	10.2	40	50
12	731221205015	KRISHNAN S	58	34.8	37	72
13	731221205016	MADHANKUMAR N	27	16.2	37	53
14	731221205017	MAHADEVAMMA S	25	15	36	51
15	731221205019	MANIGANDAN M	8	4.8	37	42
16	731221205020	MANILA K	18	10.8	39	50
17	731221205021	MANOJKUMAR S	36	21.6	38	60
18	731221205022	MAVURIYA D	35	21	37	58
19	731221205023	MEGALA THANGAMANI M	42	25.2	36	61
20	731221205026	MOTHIR L	17	10.2	40	50

S.NO	REGISTER NUMBER	NAME	INTERNAL MARKS(50)	INTERNAL MARKS(100)	INTERNAL MARKS(60)	ASSIGNMENT MARKS (40)	TOTAL (100)
21	731221205027	MOUNA SAKTHI G	0	0	0	38	38
22	731221205028	NANDHINI S	25	50	30	39	69
23	731221205029	NAVEEN S	35.5	71	42.6	39	82
24	731221205030	PANDEESWARAN C K	30.5	61	36.6	40	77
25	731221205031	PARTHIBAN M	30	60	36	39	75
26	731221205032	RAKSHITHA B	39	78	46.8	37	84
27	731221205033	RATHNA R	37	74	44.4	37	81
28	731221205034	RAVIKUMAR M	30.5	61	36.6	38	75
29	731221205035	RITHIK S	36	72	43.2	40	83
30	731221205036	ROHITH V	37	74	44.4	39	83
31	731221205037	SHARANKUMAR M V	32	64	38.4	38	76
32	731221205038	SIDDAPPA S	16	32	19.2	40	59
33	731221205039	SUNDHARESWARI V	33	66	39.6	40	80
34	731221205040	SUYAMBURAJ C	31	62	37.2	40	77
35	731221205041	SWETHA S	44	88	52.8	36	89
36	731221205042	TAMILSELVAN M	32.5	65	39	36	75
37	731221205044	YUSWANTHRAA R	29	58	34.8	40	75
38	731221205301	AHALYA J C	27.5	55	33	40	73

SUBJECT FACULTY

HOD

14/10/22

Reg. No : 731221205012

Name : G. Kavibharathi

Dept : B. Tech - I T

Year : II - year

Sub-code : CS 3391

Subject : Object Oriented Programming

Session : FN

Date : 14.10.2022

84/100

Internal Assessment - I

Part - B

11.

(b) Features of OOPs :

Object Oriented Programming paradigms is based on concept of object, which contain data in the form of field (or) attributes and codes in the form of procedure (or) methods.

i) Object

ii) Class

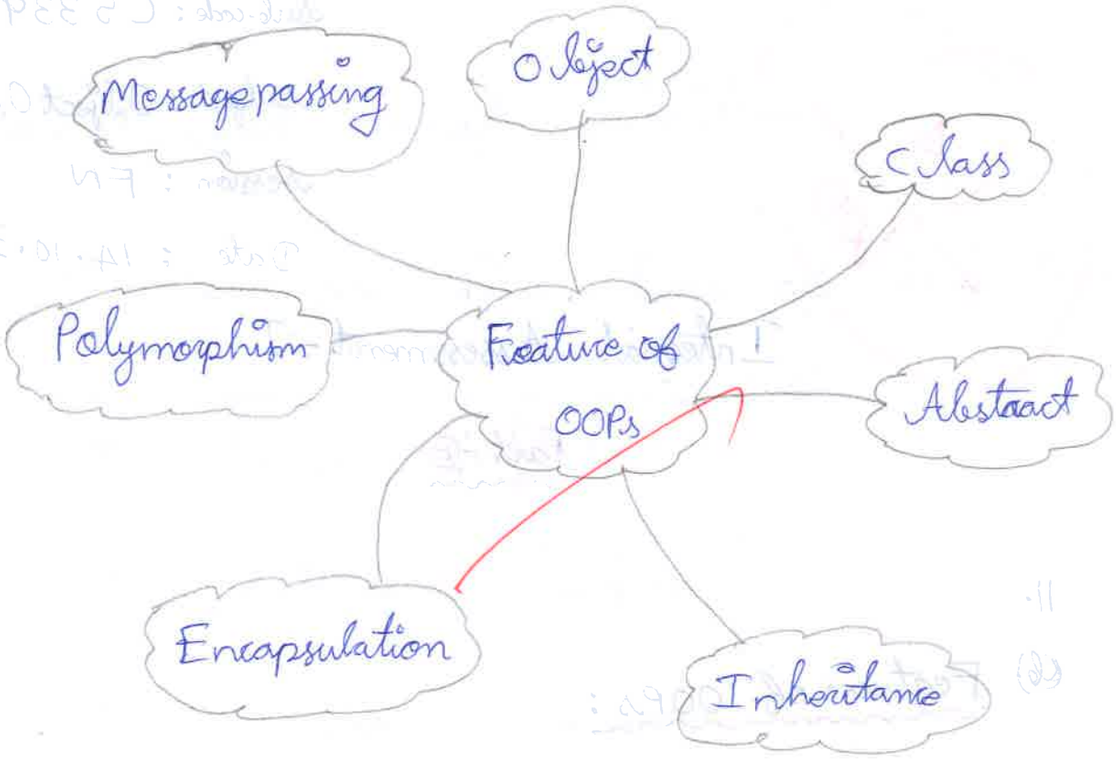
iii) Inheritance

iv) Abstraction

v) Encapsulation

vi) Polymorphism

vii) Message passing



1) Object :

* Object is real world entity.
* Object is run time entity.
* There are three characterstics ;
  * State
  * Behaviours
  * Identity.

* State — Represent the object of an data.

* Behaviours - Represent the function of an object.

* Identity - Object Identity is the typically implement of VIA Unique ID.

(II) Class :

* Blueprint (or) template in which from object are created.

Syntax :

```
Class < class name>
{
    field ;
    methods;
}
```

Ex:

```
Class JKKm
{
String (str) Dept;
String Standard;
}
```

(III) Inheritance :

* Inheritance is the capability of derived class is inherite to property from parent class squad inheritance.

*. There are five types of inheritance

*. Single inheritance

*. Multiple inheritance

*. Multilevel inheritance

*. Hybrid inheritance

*. Hierarchical inheritance

IV) Abstraction :

*. Abstraction is a core of the concept of object oriented programming language. That it is used hiding the message and essential information

Ex : ATM, sending SMS in our mobile.

14/10/23

(V) Encapsulation:

*. Encapsulation is the method and data is bundled in the object.

Ex: Capsule, E-mail.

(VI) Polymorphism:

*. Polymorphism is the different ways of object.

Ex: Smartphone.

12. (a) Arrays:

*. Array is the collection of data types in stored same element of data.

*. There are are two types of Arrays.

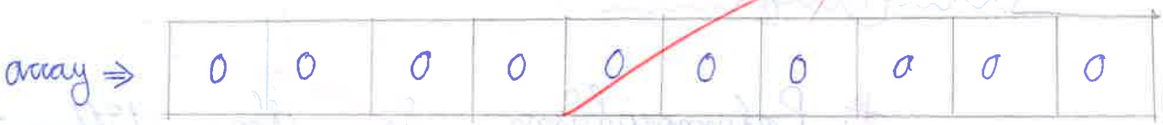
*. One dimensional Array.

*. Two dimensional Array.

*. One dimensional Array:

*. One dimensional is the collection of elements in the data type.

a[10]



Example:

```
Class Arr Demo.
{
public static void main (String [] args)
{
int a=10
a[10];
System.out.println("List of the array number")
```

$a_0 = a[1]$

$a_1 = a[2]$

$a_2 = a[3]$

$a_3 = a[4]$

$a_4 = a[5]$

$a_5 = a[6]$

$a_6 = a[7]$

$a_7 = a[8]$

$a_8 = a[9]$

$a_9 = a[10]$

```
System.out.println("Array of a5=" + a[5]);
    }
}
```

Output:

List of the array number.

Array of $a_5 = a[5]$

*. Two dimensional Array:

* Two dimensional Array is collection element stored in same data type.

a[0] =	0	0	0	0	0	0	0	0	0

Ex:

$$\text{Array} = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$$

13. (a) Operators :

* Operator is the used to mathematical problem.

* Types of Operators;

  * Arithmatic operator
  * Relationship operator
  * Logical operator
  * Assignment operator
  * Increasement Operator
  * Decreasement Operator

* Arithmatic Operators :

+ → Addition	c = a+b
− → Subtraction	c = a-b
* → Multiplication	c = a*b
/ → Division	c = a/b
% → mode.	c = a%b

Example:

```
Class ArthOPR DEMO
{
public static void main (String [] args)
{
int a = 20 , b = 10 , c ;
{
c = a+b ;
System . out . print Ln (" Addition of the number="+c)
c = a-b ;
System . out . print ln (" Subtraction of the number="+c)
c = a*b ;
System . out . print ln (" Multiplication of the
                          numbe ="+c)
}
}
}
```

Output:

Addition of the number = 30

Subtraction of the number = 10

Multiplication of the number = 200

```
{
System . out . print ln ("Enter the number a, b : ")

if a < b {
system . out . print ln ("a is less than b:");

else {
a > b ;
system . out . print ln ("a is greater than b :");
}
}
}
```

Output :

Enter the number a, b : 25 , 10

a is greater than b.

Logical operators :

* AND → &&
* OR → ||

Increasement operators :

++ → increase

Ex : a++

Decreasement operators :

-- → decrease

Ex : --b

Assignment Operators:

* Addition equal → +=

Ex: a += b

* Substraction equal → -=

Ex: a -= b

* equal equal → ==

Ex: a == b

* Less than equal → <=

Ex: a <= b

14.

(b) Abstract Class:

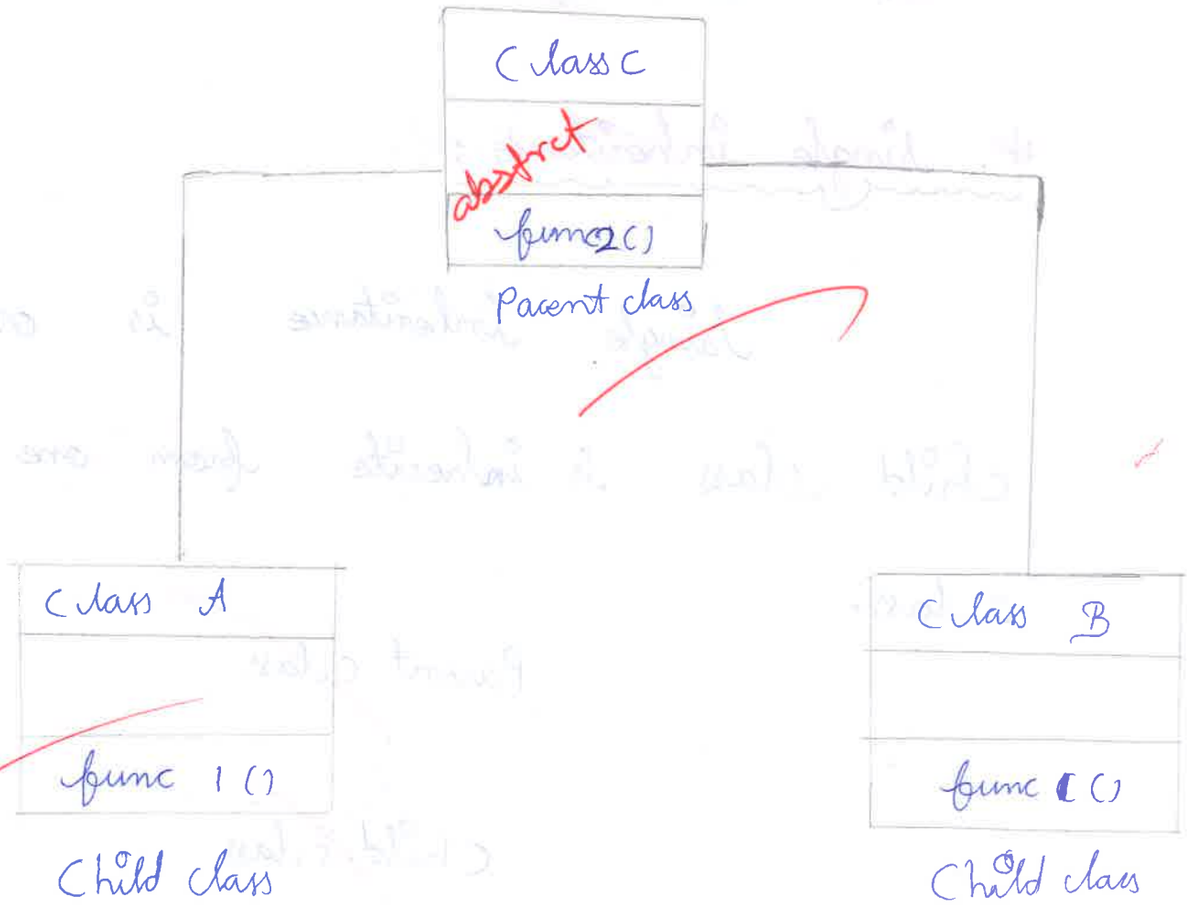
* Abstract class is one derived class from to parent class.

* Class A is child class.

* Class C is parent class.

* Class B is another child class.

following picture.



15. (b) i) Inheritance :

*. Inheritance is the capablity of one child class is inherite to parent class squad inheritance.

*. There are five types of inheritance

*. Single inheritance

*. Multiple inheritance

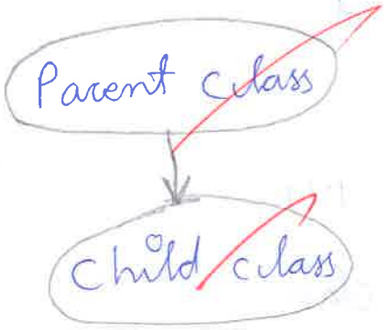
*. Multilevel inheritance

* Hybrid inheritance.

* Hierarchical inheritance.

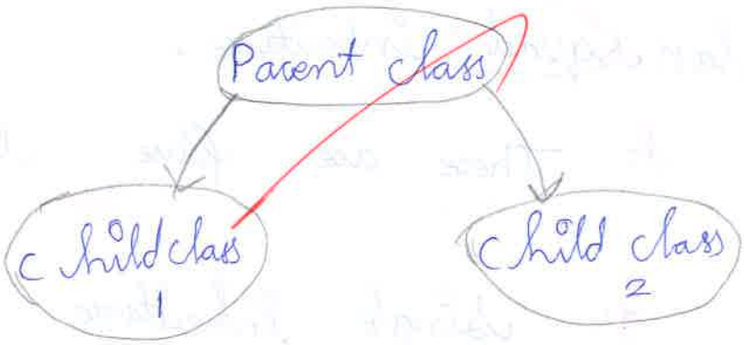
* Single inheritance :

Single inheritance is only one child class is inherite from one parent class.



* Multiple inheritance :

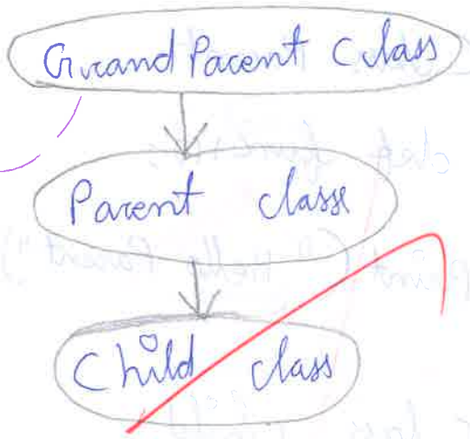
Multiple inheritance is two child class is inherite from one parent class.



* Multilevel inheritance :

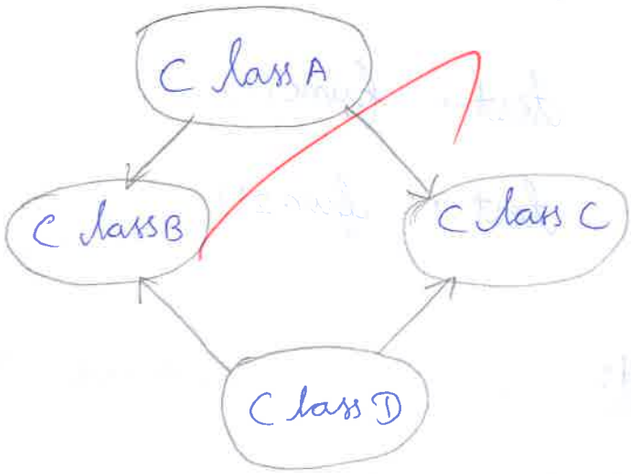
Multilevel inheritance is Grandparent class is Inherite by parent class and again

parent class is inherite from child class.



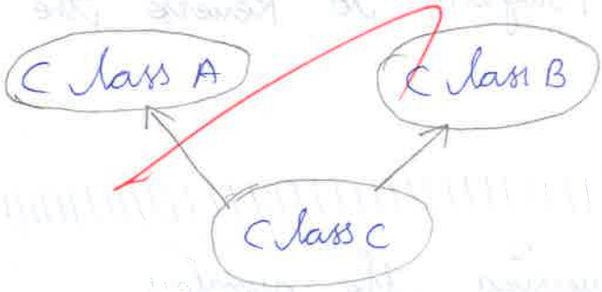
*. Hybrid Inheritance :

Hybrid inheritance is combined to multiple and Multilevel inheritance.



*. Hererchical inheritance :

Hiererchical inheritance is opposite of multiple inheritance.



15. (b) (ii) Program:

```
Class Parent
  def func1();
  Print("Hello Parent")

Class Child
  def func2();
  Print("Hello child")

test.child()
test.func1()
test.fun2()
```

Output:

Hello parent

Hello child

---

(11) a) (ii) Program to Reverse the given number 1234567 89.

```
////////////////////////////////////
Reversing the numbers
////////////////////////////////////
```

14/10/22

```
Class Revnum DEMO
{
public static void main (string [] args)
{
int num = 1 2 3 4 5 6 7 8 9;
{
Rev_num = 0;
while (num != 0);
Print System.out.println ("Reversing the number :")
}
System.out.println ("Rev_num = " + num)
}
}
```

Output:

Reversing the number:

9 8 7 6 5 4 3 2 1

Part-A

1) Inheritance:

*. Inheritance is the capablity of derived is inherite from parent class upgrade.

* There are five types of inheritance.

i) Single inheritance.
ii) Multiple inheritance.
iii) Multilevel inheritance.
iv) Hybrid inheritance.
v) Hierarchical inheritance.

---

2) Super keyword :

Super keyword is initialized used to mathematical methods.

---

3) Java Buzzwords :

* Simple java.
* Object oriented
* Plateform independent
* Sequare
* Robust.
* Architectural Neutral
* Portable
* Dynamic
* High Performing
* Distributed

4) Final keyword :

Final keyword is used to end of the program.

5) List of inner classes :

* Static member class
* Member class
* Local class
* Anonymous class

6. Method Dispatch :

Dynamic method dispatch is the Run time overriding of the method.

7. Java doc :

Java doc stored in the object.

Java doc are stored in dot (.) Java.

8) Control statements :

* If statement
* If...else statement
* While statement
* do-while statement
* Switch case statement
* For-loop statement

9) Advantages :

* Easy for this type.
* Very easier understand.

10) Class :

* Class is the blue print.
* Collection of object is class.
* class <class name>
{
field ;
methods ;
}

J.K.K.MUNIRAJAH

COLLEGE OF TECHNOLOGY

T.N.PALAYAM Accredited by NAAC with 'A' Grade

www.jkkmct.edu.in, Landline no: 04285260754 / 260755

JKKMCT/CIRCULAR/041/SEP-22 **DATE: 22/09/2022**

CIRCULAR

All the UG Degree (B.E/B.Tech) **Second year (III SEMESTER)** students are informed that **First and Second Internal Assessment Scheduled are**

Report No	Report Period	Internal Assessment Date	Report Entry last date
FIRST	22-08-2022 to 15-10-2022	10,11,12,13,14-10-2022 & 15-10-2022	20-10-2022
SECOND	17-10-2022 to 08-12-2022	01, 02, 03-12-2022 & 05, 06, 07-12-2022	09-12-2022

All the subject handlers are informed that should **produce Two Set of Question papers** (Maximum marks 100) in Examcell within two days before the exam date.

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY * THOOKKANAICKENPALAYAM * Gobi (Tk), Erode (Dt) -638 506.

22/9/22

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OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
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JKKMCT/CIRCULAR/042/SEP-22 **DATE: 22/09/2022**

CIRCULAR

All the UG Degree (B.E/B.Tech) **3rd Year & Final year** students are informed that **First, Second & Third Internal Assessment Scheduled are,**

Report No	Report Period	Internal Assessment Date	Report Entry last date
FIRST	10-08-2022 to 23-08-2022	-	29-09-2022
SECOND	24-08-2022 to 21-09-2022	26, 27, 28-09-2022	05-10-2022
THIRD	22-09-2022 to 21-10-2022	20, 21, 22-10-2022	28-10-2022
FOUR	22-10-2022 to 19-11-2022	17, 18, 19-11-2022	21-11-2022

All the subject handlers are informed that should **produce Two Set of Question papers** (Maximum marks 50) in Examcell within two days before the exam date.

PRINCIPAL 22/9/22

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Approved by AICTE, New Delhi And Affiliated to Anna University, Chennai.

T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

JKKMCT/EC/91/2022 **DATE: 12.12.2022**

CIRCULAR

SECOND INTERNAL EXAMINATION - INSTRUCTIONS

Second Internal Examination for II year will be conducted from 19.12.2022 (Monday) to 23.12.2022 (Friday). All the faculty members handling subjects for III semester are requested to submit the question bank through their respective HOD /Exam cell in charge on or before 16.12.2022 (Friday).

SYLLABUS: LAST 2.5 UNITS ONLY

Important Instructions regarding Question Paper setting:

- Faculties handling the subjects are requested to submit the common Question Bank.
- II year AUTO, CIVIL,CSE&IT,ECE,EEE & MECH
- File name of the question bank is to be saved as [year] [dept] [subcode] [QB] [Int].pdf

  Example:II_CIVIL_MA8351_QB_Int 2.pdf

  NOTE:
- Exam cell in charges are requested to act their respective department question as per the following schedule.

S.NO	DATE	DEPARTMENT	TIME
1	16.12.2022	AUTO,MECH,CIVIL CSE,IT EEE,ECE	09.30AM to 12.30PM

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The student's circulation,

Notice boards and File copy

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T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

Dear Sir/Madam,

Second Internal Assessment for II year will be conducted during 19.12.2022(Monday) to 23.12.2022(Friday).

Syllabus: Last 2.5 Units

Duration: 3.00 Hrs

Maximum Marks: 100

- Faculties are requested to submit the question papers to the respective department HOD as per the format attached.
- The last date to submit question paper and answer key is 12.12.2022(Friday).
- The file name of the question is to be saved as [year][dept][subcode].pdf
- Example: II_CIVIL_MA8353_Set1, II_CIVIL_MA8353_Set2
- Late submission of question paper and answer key is not entertained.

Important Instruction Regarding Question Paper Setting:

- All the faculties are instructed to submit the question paper preferably within a single A4 page following the format enclosed.
- All the faculties are instructed to submit the question paper as per the prescribed format only(kindly find the attachment from the mail) & mention the session with date in the question paper.(Example:19.12.2022 - 9.30AM)
- All first year subject handling staff members are requested to submit the common question paper.

EXAM CELL

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J K K MUNIRAJAH COLLEGE OF TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

INTERNAL ASSESSMENT - II SCHEDULE - DECEMBER - 2022

II - YEAR IT

EXAM TIMING – FN: 9.30 AM TO 12.30 PM

S.NO	DATE	DAY	SUBJECT CODE / NAME	STAFF SIGNATURE
			FN	
1	19.12.2022	MONDAY	MA3354 DM	
2	20.12.2022	TUESDAY	CS3352 FDS	
3	21.12.2022	WEDNESDAY	CD3291 DSA	
4	22.12.2022	THURSDAY	CS3391 OOPS	
5	23.12.2022	FRIDAY	CS3351 DPCO	
			TUTOR SIGNATURE	

EXAM CELL INCHARGE **HOD** **PRINCIPAL**

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY, T.N. PALAYAM, GOBI-638506

DEPARTMENT OF INFORMATION TECHNOLOGY

INTERNAL ASSESSMENT - II DECEMBER 2022

FACULTY DUTY CHART

S.NO	STAFF NAME	19.12.2022	20.12.2022	21.12.2022	22.12.2022	23.12.2022	SIGNATURE
1	S.SAMYUKTHA	*					
2	N.NAVINDRAN		*				
3	S.KANIMOZHI			*			
4	P.SANGEETHA					*	
5	E.VIJAY ANANTH				*		
6	S.PRIYA		*				
7	V.KALAIVENDHAN						
8	K.R.VIKNESHWARA				*		
9	D.NIVETHINI					*	
10	S.SUDHAKAR	*					
11	A.SAMBATHKUMAR			*			

Note:

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2.Students should not be allowed to leave te hall before 11.30 AM for FN and 4.00 PM for AN
3.Students should not be allowed to write exam without ID card.
4.Students are not permitted to get anything from anybody inside exam hall.

EXAM CELL INCHARGE **HOD** **PRINCIPAL**

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
II-IT / III SEM
INTERNAL ASSESMENT II

SUB CODE :CS3391 SUB NAME :OBJECT ORIENTED PROGRAMMING

S.NO	REGISTER NUMBER	NAME	INTERNAL MARKS(100)	INTERNAL MARKS(60)	ASSIGNMENT MARKS (40)	TOTAL (100)
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3	731221205005	DEVIKA A	66	39.6	39	79
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10	731221205012	KAVIBHARATHI G	67	40.2	40	80
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13	731221205016	MADHANKUMAR N	24	14.4	39	53
14	731221205017	MAHADEVAMMA S	27	16.2	39	55
15	731221205019	MANIGANDAN M	18	10.8	39	50
16	731221205020	MANILA K	32	19.2	40	59
17	731221205021	MANOJKUMAR S	58	34.8	38	73
18	731221205022	MAVURIYA D	73	43.8	39	83
19	731221205023	MEGALA THANGAMANI M	79	47.4	40	87
20	731221205026	MOTHIR L	29	17.4	39	56

S.NO	REGISTER NUMBER	NAME	INTERNAL MARKS(100)	INTERNAL MARKS(60)	ASSIGNMENT MARKS (40)	TOTAL (100)
21	731221205027	MOUNA SAKTHI G	10	6	38	44
22	731221205028	NANDHINI S	AB	AB	38	38
23	731221205029	NAVEEN S	51	30.6	37	68
24	731221205030	PANDEESWARAN C K	20	12	36	48
25	731221205031	PARTHIBAN M	12	7.2	38	45
26	731221205032	RAKSHITHA B	40	24	38	62
27	731221205033	RATHNA R	39	23.4	36	59
28	731221205034	RAVIKUMAR M	30	18	38	56
29	731221205035	RITHIK S	60	36	36	72
30	731221205036	ROHITH V	26	15.6	36	52
31	731221205037	SHARANKUMAR M V	57	34.2	39	73
32	731221205038	SIDDAPPA S	1	0.6	37	38
33	731221205039	SUNDHARESWARI V	52	31.2	37	68
34	731221205040	SUYAMBURAJ C	22	13.2	37	50
35	731221205041	SWETHA S	41	24.6	36	61
36	731221205042	TAMILSELVAN M	23	13.8	38	52
37	731221205044	YUSWANTHRAA R	54	32.4	37	69
38	731221205301	AHALYA J C	50	30	38	68

SUBJECT FACULTY

HOD

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
II-IT / III SEM
ASSIGNMENT 1

SUB CODE : CS3391 **SUB NAME :** OBJECT ORIENTED PROGRAMMING

S.NO	REG NUMBER	NAME	BATCH NO	TOPIC	MARKS
1	731221205003	BHUVANESHWARAN M	1	Overview of oop.	36
2	731221205004	BOOPATHI C			38
3	731221205005	DEVIKA A			37
4	731221205006	DHANALAKSHMI C			37
5	731221205007	DHARSHINI P			37
6	731221205008	DHAYALAN R	2.	Introduction to Java.	37
7	731221205009	DINESH M			38
8	731221205010	DIVYA S			36
9	731221205011	KARTHICKRAJA G			38
10	731221205012	KAVIBHARATHI G			36
11	731221205013	KOWSALYA G	3.	Operators.	40
12	731221205015	KRISHNAN S			37
13	731221205016	MADHANKUMAR N			37
14	731221205017	MAHADEVAMMA S			36
15	731221205019	MANIGANDAN M			37

S.NO	REG NUMBER	NAME	BATCH NO	TOPIC	MARKS
16	731221205020	MANILA K	4.	Define class in Java.	39
17	731221205021	MANOJKUMAR S			38
18	731221205022	MAVURIYA D			37
19	731221205023	MEGALA THANGAMANI M			36
20	731221205026	MOTHIR L			40
21	731221205027	MOUNA SAKTHI G	5	Static Method.	38
22	731221205028	NANDHINI S			38
23	731221205029	NAVEEN S			37
24	731221205030	PANDEESWARAN C K			36
25	731221205031	PARTHIBAN M			38
26	731221205032	RAKSHITHA B	6	Static Nested and inner class.	38
27	731221205033	RATHNA R			36
28	731221205034	RAVIKUMAR M			38
29	731221205035	RITHIK S			36
30	731221205036	ROHITH V			36

S.NO	REG NUMBER	NAME	BATCH NO	TOPIC	MARKS
31	731221205037	SHARANKUMAR M V	7	Method overriding	39
32	731221205038	SIDDAPPA S			37
33	731221205039	SUNDHARESWARI V			37
34	731221205040	SUYAMBURAJ C			37
35	731221205041	SWETHA S			36
36	731221205042	TAMILSELVAN M	8.	Handling mouse event.	38
37	731221205044	YUSWANTHRAA R			37
38	731221205301	AHALYA J C			38

FACULTY INCHARGE

HEAD OF THE DEPARTMENT

T.K.K. Munirajah College of Technology

Assignment - I

CS3391 - Object Oriented Programming

Reg. No : 731221205012

Name : G. Kavibharathi

Dept : B.Tech - IT

Year : II - year

40/40

Staff signature

G. Kavibharathi
Student signature

① Java Buzzwords :

*. Java is getting popular because of its features. Following is a list of buzzwords that makes java a popular programming language.

*. Simple java
*. Robust
*. Secure
*. Platform independent
*. Portable
*. Object oriented
*. Multithread
*. Interpreted
*. Dynamic
*. high performance
*. distributed

1) Java is simple :

*. Java is a simple programming language. Even though you have no programming background you can learn this language comfortably.

*. The programmers who worked on C (or) C++ can learn this language more efficiently because the syntax of Java resembles with C and C++.

*. In fact Java is made more clear and adaptable than C++.

2) Java is Robust and secure:

*. Java does not support the concept of pointers directly. This makes it impossible to accidentally refference memory that belongs to other programs (or) the kernel.

*. In programming language like C (or) C++ the memory management is done explicity by the user. That means user allocates or deallocates the memory. Whereas in Java its automatically done using garbage collection. Thus user can not perform the memory management directly

*. If an applet is executing in some browser then it is not allowed to access the file system of local machine.

3) Java is a platform independent and portable :

*. Plateform Independence is the most exciting feature of Java program. That means programs in Java can be executed on variety of platforms. This feature is based on the goal - write once, run anywhere and at anytime foreever.

*. Java supports portability in 2 ways - Java compiler generates the byte code which can be further used to obtain the corresponding machine code. Secondly the primitive data types used in Java are machine independent

4) Java is known as object oriented :

*. Java is popularly recognised as an object oriented programming language.

*. It supports various object oriented features such as data encapsulation, inheritance, polymorphism and dynamic binding.

*. Everything in Java is an object.

5) Java is multithread and Interactive:

*. Java supports multithreaded programming which allows a programmer to write such a program that can perform many tasks simultaneously.

*. This ultimately helps the developer to develop more interactive code.

6) Java can be compiled and interpreted:

*. Normally programming languages can be either compiled or interpreted but java is a language which can be compiled as well as interpreted.

*. First, java compiler translates the java source program into a special code called bytecode. Then java interpreter this bytecode to obtain the equivalent machine code.

* This machine code is then directly executed to obtain the output.

7) High Performance:

*. Due to the use of bytecode the java has high performance. The use of multi-threading also helps to

improve the programance of the java.

*. The J2SE helps to increase the scalability in java. For monitoring and management java has large number of Application Programming Interfaces.

*. There are tools available for monitoring and tracking the information at the application level.

8. Java is a dynamic and extensible language:

*. This language is capable of dynamically linking new class libraries, methods and objects.

*. The java also supports the functions written in C and C++. These functions are called native methods.

9) Distributed:

*. This feature is very much useful in networking environment.

*. In java, two different objects on different computers can communicate with each other.

*. This can be achieved by Remote Method Invocation.

② Introduction in Java:

*. Java was invented by James Gosling, Patrick Naughton, Chris Warth, Ed Frank and Mike Sheridan. It sun Microsystems, Inc in 1991. It took 18 months to complete the first working version of Java.

*. This language was initially called as Oak but was renamed as Java in 1995.

*. Java is purely an object oriented programming language as its supports various features like classes. Objects, abstraction, inheritance and polymorphism.

Java Buzzwords:

*. Java is getting popular because of its feature Following its a list of buzzwords that makes java a popular programming language.

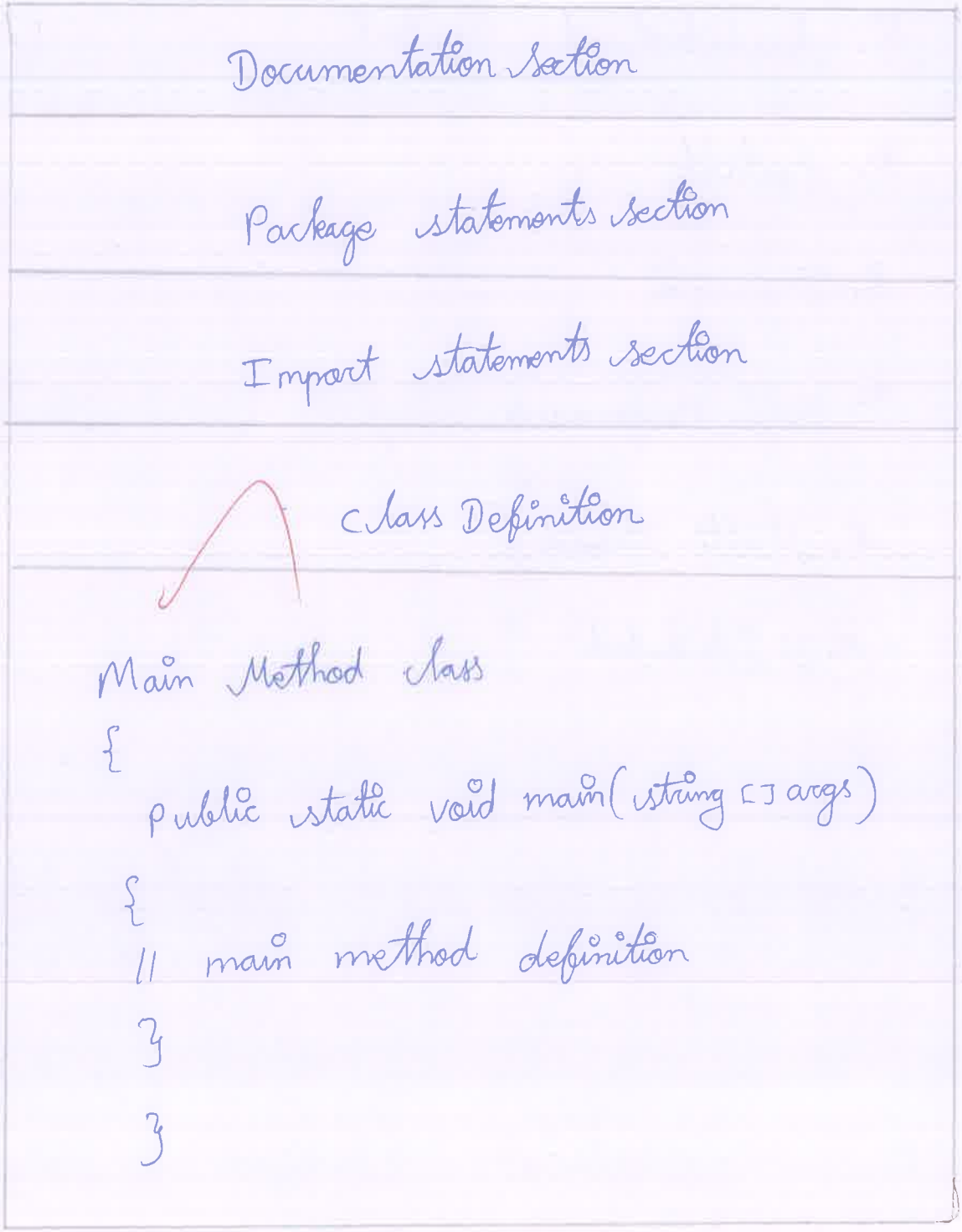
*. Simple java

*. Object oriented

* Platform independent
* Secure
* Robust
* Architectural Neutral
* Portable
* Dynamic
* High Performance
* Multi thread
* Distributed

③ Structure in Java Program :

The program structure for the Java program is as given in the following figure.



*. Documentation section:

The documentation section provides the information about the source program. This section contains the information which is not compiled by the java. Everything written in this section is written as comment.

*. Package section:

It consists of the name of the package by using the keyword package. When we use the classes from this package in out program then it is necessary to write the package statement in the begining of the program.

*. Import statement section:

All the required java API can be imported by the import statement. There are some core package present in the java. These package can be imported in the program in order to use the classes

and methods of the program.

*. Class definition section :

The class definition section contain the definition of the class. This class normally contains. the data and the methods manipulating the data.

*. Main method class :

This is called the main method class because it contains the main() function. This class can access the methods defined in other classes.

④ Data types :

Various data types used in java are byte, short int, long, char, float, double and boolean.

Byte :

This is in fact smallest integer type of data type. It is width is of 8-bits with the range -128 to 127. The variable can be declared as byte type as -

```
byte i,j;
```

Short :

This data type is also used for defining the signed numerical variables with a width of 16-bits and having a range from -32768 to 32767. The variable can be declared as short as.

```
short a,b;
```

int :

This is the most commonly used data type for defining the numerical data. The width of this data type

is 32-bit having a range 2,147,483,648 to 2,147,483,647. The declaration can be int p,q;

long:

Sometimes when int is not sufficiant for declaring some data then long is used. The range of long is realy very long and it is -9 223,372, 036,854,808 to 9,223,372,036,854,808. The declaration can be long x,y;

float:

To represent the real number float data type can be used. The width is 32-bit and range of this data type is 1.4e-045 to 3.4e+038.

double:

To represent the real number of large range the double data type is used. Its width is 64-bit having the range 4.9e-324 to 1.8e+308.

Char:

This data type is used to represent the character type of data. The width of this data type is 16-bit and its range is 0 to 65,536.

Boolean :

Boolean is a simple data type which denotes a values to be either true or false.

Program :

```
Class Data type Demo
{
public static void main (string args[])
{
byte a=10;
short b=10*128;
int c = 10000*128;
long d = 10000*1000*128;
double e= 99,9998;
char f='a';
boolean g= true;
boolean h= false;
System.out.println("The value of a ="+a);
System.out.println("The value of b="+b);
System.out.println("The value of c ="+c);
System.out.println("The value of d="+d);
```

```
System.out.println("The value of e="+e);
System.out.println("The value of f="+f);
f++;
System.out.println("The value of after increament="+f);
System.out.println("The value of g="+g);
System.out.println("The value of h="+h);
}
}
```

Output:

The value of a = 10

The value of b = 1280

The value of c = 1280000

The value of d = 1280000000

The value of e = 99.9998

The value of f = a

The value of f = after increment = b

The value of g = true

The value of h = false.

JKK MUNIRAJAH COLLEGE OF TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY
II-IT / III SEM
ASSIGNMENT 2

SUB CODE : CS3391 **SUB NAME :** OBJECT ORIENTED PROGRAMMING

S.NO	REG NUMBER	NAME	BATCH NO	TOPIC	MARKS
1	731221205003	BHUVANESHWARAN M	1	Exception handling.	39
2	731221205004	BOOPATHI C			38
3	731221205005	DEVIKA A			39
4	731221205006	DHANALAKSHMI C			39
5	731221205007	DHARSHINI P			38
6	731221205008	DHAYALAN R	2.	Multithread programming	39
7	731221205009	DINESH M			39
8	731221205010	DIVYA S			39
9	731221205011	KARTHICKRAJA G			38
10	731221205012	KAVIBHARATHI G			40
11	731221205013	KOWSALYA G	3.	Concept of Thread.	40
12	731221205015	KRISHNAN S			39
13	731221205016	MADHANKUMAR N			39
14	731221205017	MAHADEVAMMA S			39
15	731221205019	MANIGANDAN M			39

S.NO	REG NUMBER	NAME	BATCH NO	TOPIC	MARKS
16	731221205020	MANILA K	4.	Reading and writing concept IIo	40
17	731221205021	MANOJKUMAR S			38
18	731221205022	MAVURIYA D			39
19	731221205023	MEGALA THANGAMANI M			40
20	731221205026	MOTHIR L			39
21	731221205027	MOUNA SAKTHI G	5.	output stream.	38
22	731221205028	NANDHINI S			38
23	731221205029	NAVEEN S			39
24	731221205030	PANDEESWARAN C K			40
25	731221205031	PARTHIBAN M			39
26	731221205032	RAKSHITHA B	6.	Generic method.	40
27	731221205033	RATHNA R			39
28	731221205034	RAVIKUMAR M			39
29	731221205035	RITHIK S			38
30	731221205036	ROHITH V			40

S.NO	REG NUMBER	NAME	BATCH NO	TOPIC	MARKS
31	731221205037	SHARANKUMAR M V	7.	Basics of Javafx.	38
32	731221205038	SIDDAPPA S			38
33	731221205039	SUNDHARESWARI V			40
34	731221205040	SUYAMBURAJ C			40
35	731221205041	SWETHA S			40
36	731221205042	TAMILSELVAN M	8.	Package and interfaces.	40
37	731221205044	YUSWANTHRAA R			40
38	731221205301	AHALYA J C			40

FACULTY INCHARGE

HEAD OF THE DEPARTMENT

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

ASSIGNMENT - 2

NAME : RAKSHITHA.B

REG NO : 731221205032

DEPARTMENT: B.TECH.IT

SUBJECT : OBJECT ORIENTED PROGRAMMING

40/40

SIGNATURE OF STUDENT

SIGNATURE OF STAFF

Generic Methods:-

* Generic methods allows a programmer to write a generalised method for the methods of different data types.

* Suppose we want to print an array of integer, float and character type elements. then normally we write three different methods performing the corresponding tasks. The object oriented feature of Java allows us to make us of same function name. This idea is illustrated in following Java Program.

Java Program [Overload Prog1.Java].

```
import java.io.*;
import java.util.*;
Public class Overload Prog1.
{
Public static Void display (float [] a)
{
```

```
For (int i=0; i<5; i++)
System.out.printf("%.2f", a[i]);
}
Public static void display(int[]a)
{
for(int i =0; i<5; i++)
System.out.printf("%.2f", a[i]);
}
Public static void display(int(int[]a)
{
for (int i=0; i<5; i++)
System.out.printf("%d", a[i]);
}
Public static void display(char[]a)
{
for(int i=0; i<5; i++)
System.out.printf("%c", a[i]);
}
public static void main(String[]args)
{
```

Java program 8.

```
import java.io.*;
import java.util*;
Public class OverLoad prog2
{
PubLic Static <T> void display (T[]a)
{
For(int i=0;i<5;i++)
System.out.printf("%s",a[i]);
}
Public static void main(String[]args)
{
float[]dbl_a = {11,22,33,44,55};
int[]int_a = {1,2,3,4,5};
char[]char_a = {'A','B','C','D','E'};
System.out.println("\n The float elements
                    are...");
display (dbl_a);
System.out.println("\n The Integer
                    elements are...");
display (int_a);
System.out.println("\n The character elements
                    are...");
```

```
Float[] dbl_a = {11, 22, 33, 44, 55};
int[] int_a = {1, 2, 3, 4, 5};
char[] char_a = {'A', 'B', 'C', 'D', 'E'};
System.out.println ("\n The Integer elements are
display (int_a);
System.out.println ("\n The character
                    elements are ----- ");
display (int_a);
System.out.println ("\n The character
                    elements are ----- ");
display (char_a);
  }
}
```

output:

```
The Float elements are ----
11.00  22.00  33.00  44.00  55.00
The Integer elements are ----
1 2 3 4 5
The character elements are ----
A B C D E
```

```
display (char_a);
    }
}
```

Output:

```
The Float elements are....
11.00 22.00 33.00 44.00 55.00
The Integer elements are....
1 2 3 4 5
The character elements are....
A B C D E
```

Write generic methods for Sorting an array of integer objects.

```
Private <E extends comparable<E>>
Void bubbleSort(E[] Arr){
  For(int j=1; j< Arr.length; j++){
    For(int i=0; i< Arr.length-j; i++){
      temp = Arr[i];
      Arr[i] = Arr[i+1];
      Arr[i+1] = temp;
    }
}
```

```
}
for (E i: Arr){
    system. out. print("" +i);
}
}
```

Generic classes:

A generic class contains one or more variables of generic data type

```
Public class Test <T>
{
Public Test() {val = null;}
Public Test (T val)
{
   this.val = val;
}
public get Val ()
{  return val;
}
```

```
    Val = new Value;
  }
  private T Val; // Variable defined as of
generic type.
  }
```

Create a generic class for the stack data structure. Your class must handle Integer and character type elements. Show clearly how will you handle the stack empty condition.

Sol: We will create a generic class for Stack data structure using following steps.

Step 1: Create a java file named Stack.java as follows.

Java program:

```
import java.util.*; // supports the
                    ArrayList.
public class Stack <T> // T denotes any
                          data type
{
public ArrayList <T> obj;
```

```
Public stack (int size) // Constructor will
                           be invoked from main
{
 obj = new ArrayList <T> (size);
}
Public void push (T item) // Generic method
                             For PUSH operation
 {
 obj. add (item);
 }
 public T pop ()// Generic method for pop
                                operation
 {
 if (obj. isEmpty ())
 {
 System.out.println ("In stack is Empty");
 return null;
 }
 return obj. remove (obj. size()-1);
 }
}
```

Step 2: create another java program in a separate file named stackGeneric.java.

```
System.out.println("\n Popping two elements
                    from character stack");
for(int i=0; i<2; i++)
System.out.printf("\n%c", cst.pop());
System.out.println("\n popping all the elements
                    from integer stack");
for(int i=0; i<5; i++)
system.out.printf("\n%d", ist.pop());
system.out.println("\n performing one more
                    pop for integer stack");
system.out.printf("\n%d", ist.pop());
}
}
```

Output:

```
F:\> java stackGeneric.java
F:\> java stackGeneric
Pushing the elements integer stack
Pushing the elements in character stack
Popping two elements from character stack
E
D
```

```
import java.io.*;
import java.util.*;
Public class Stack Generic
{
public static void main (String[] args)
{
int[] iArray = {1, 2, 3, 4, 5};
char[] cArray = {'A', 'B', 'C', 'D', 'E', };
Stack<Integer> ist = new Stack<Integer
                              >(5);
System.out.println("In pushing the
                    elements in integer Stack");
for (int i=0; i<5; i++)
ist.push (iArray[i]),
System.out.println("In pushing the
                    elements in integer Stack");
for (int i=0; i<5; i++)
cst.push (cArray[i]);
```

Popping all the elements from integer stack

5
4
3
2
1

performing one more pop for integer stack

Stack is Empty.

Null.

Using generic classes, write a program to perform the following operations on an array i) Add an element inthe beginning / middle / end ii) Delete an element from agive position

```
import java.io.*;
import java.util.*; // supports the Array List
class Arr <T> // T denotes any data type
{
Public ArrayList <T> obj
Public Arr(int size) // constructor willbe
                        invoked from main
{
    obj = new ArrayList <T> (size);
}
```

```
Public Void insert (int index, T item) //
                Generic method for insert operation
{
obj. add (index, item);
}
public Void display()
{
  system. out. print(" +obj);
}
public T del (int index) // Generic method)
                        for delete operation
 {
 obj. add (index item);
 }
 public Void display()
 {
    system. out. print(" "+obj);
 }
 Public T del (int index)// Generic method
                        for delete operation
 {
    return obj. remove (index);
  }
}
```

```
Public class Array Generic
{
  public static void main (String [] args)
  {
  int[] iArray = {1, 2, 3, 4, 5};
  Arr <Integer> iObj = new Arr <Integer> (10);
  int i, index;
  System.out.println ("In Array of integers is...");
     for (i=0; i < 5; i++)
          iObj.insert (i, iArray[i]);
     iObj.display ();
     System.out.println ("In Inserting the elements
                          in integer Array:");
  System.out.println ("Enter the element to be
                       inserted:");
  Scanner sc = new Scanner (System.in);
  int item = sc.nextInt ();
  System.out.println ("Enter the index at
                       which the element is to be inserted:");
```

```
index = sc.nextInt();
iobj.display();
system.out.println("\n Enter the index
                    of the element to be
                    deleted:");
index =sc.nextInt();
iobj.del(index);
iobj.display();
double[] dArray = {11.11, 22, 22, 33, 33, 44,
                   44, 55, 55};
Arr<Double> dobj = new Arr<Double>(10);
system.out.println("\n Array of doubles
                    is ---");
for(i=0; i<5; i++)
    dobj.insert(i, dArray[i]);
dobj.display();
System.out.println("\n Inserting the elements
                    in double Array");
system.out.println("Enter the element to be
                    inserted:");
```

```
index = sc.nextInt();
doobj.insert(index, ditem);
doobj.display();
System.out.println("\n Enter the index of
the element to be deleted: ");
index = sc.nextInt();
doobj.del(index);
doobj.display();
}
}
```

Output:

```
Array of integers is....
[1, 2, 3, 4, 5]
Inserting the elements in integer Array
Enter the element to be inserted
100
Enter the index at which the element
is to be inserted
2
```

[1, 2, 100, 3, 4, 5]

Enter the index of the element to be deleted:

4

[1, 2, 100, 3, 5]:

Array of doubles is ...

[11.11, 22.22, 33, 33, 44, 44, 55.55]

Inserting the elements in double Array

Enter the element to be inserted:

111. 222.

Enter the index at which the element is to be inserted:

3

[11.11, 22.22, 33, 33, 111, 222, 44, 44, 55 55]

Enter the index of element to be deleted:

2

[11.11, 22.22, 111, 222, 44, 44, 55.55]

Bounded Types:

* While creating objects to generic classes we can pass any derived type as type parameters.
* Fo example, If we want a generic class that works only with numbers (like int, double, float, long ---). then declare type parameter of that class as a bounded type to Number class. Then while creating objects to that class you have to pass only Number type or its subclass type as type parameters.

For example:

```
class Test <T extends Number> // Declarning Number class as upper bound of T
{
  T t;
  public Test (T t)
  {
     this. t = t;
  }
  public T get T()
  {
     return t;
```

```
}
}
public class BoundedTypeDemo
{
    public static void main(String[] args)
    {
        // creating object by passing Number as a
           type parameter
        Test <Number> obj1 = new Test <Number>(123);
        System.out.println("The integer is :" + obj
                                        1.getT());
        // error
        Test <String> obj2 = new Test <String>
                ("I am String"); // compile
                                    time error
        System.out.println("The string is :" +
                                obj2.getT());
    }
}
```

Restrictions and Limitations:

1. In java, generic types are compile time entities. The runtime execution is possible only if it is used along with raw type.

```
public class Test <T> extends Exception
{
// code  // Error: can't extend the
                Exception class
}
```

instaintiation of generic parameter T is not allowed

```
new T ()  // Error
NewT [10]
```

Arrays of parameterized types are not allowed

```
new Stack <String> [10]; // Error
```

Static fields and static methods with type parameters are not allowed.

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Reg. No. : E N G G T R E E . C O M

Question Paper Code : 30120

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

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Fourth Semester

Bio Medical Engineering

CS 3391 – OBJECT ORIENTED PROGRAMMING

(Common to : Computer Science and Engineering/Computer and Communication Engineering/Medical Electronics/Computer Science and Business Systems/Information Technology)

(Regulations 2021)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A – (10 × 2 = 20 marks)

1. What is bytecode?
2. Write the general form of the for-each version of the for statement.
3. What is the use of final keyword?
4. How dynamic method resolution is achieved in Java?
5. List the values associated with the parameters of setpriority( ) method of Thread class?
6. Define deadlock.
7. State the purpose of Valueof( ) method in String class.
8. List any two methods available in DataOutput Interface.
9. What is the use of adapter class?
10. List any two forms of CheckBoxMenuItem constructors.

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PART B — (5 × 13 = 65 marks)

11. (a) Explain in detail about Java's iteration statements with example.

Or

(b) What is a Constructor? Explain with example.

12. (a) What is a package? Explain in detail about how the packages provide access control to various categories of visibility for class members.

Or

(b) Explain in detail about the basics of inheritance and elaborate on any two inheritance mechanisms in Java.

13. (a) Explain in detail about Java's Built-in Exceptions. Explain any three exceptions.

Or

(b) Discuss in detail about the methods to create a thread in Java.

14. (a) Discuss in detail about the restrictions and limitations of using generics in Java Programming.

Or

(b) Explain the following statement "StringBuffer class create mutable stings". Explain about StringBuffer class. Compare String class with StringBuffer class.

15. (a) Explain in detail about the commonly used event listener interfaces with a sample program.

Or

(b) Write a Java Program that demonstrates mouse event handlers.

PART C — (1 × 15 = 15 marks)

16. (a) Write a java program with nested try statements that raises divide by zero exception and out of bound exception, if the program contains a statement with division operator and a divisor as a command line argument.

Or

(b) Write a java Program to copy a text file into another text file and to raise exceptions for all cases.

———————

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Reg. No. : E N G G T R E E . C O M

Question Paper Code : 70074

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Third Semester

Computer Science and Engineering

CS 3391 — OBJECT ORIENTED PROGRAMMING

(Common to : B.E. Biomedical Engineering/B.E. Medical Electronics/ B.Tech. Computer Science and Business Systems/B.Tech. Information Technology)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

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Answer ALL questions.

PART A — (10 × 2 = 20 marks)

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1. Java Language is Platform Independent. Justify your answer.
2. Difference between Method and Constructor.
3. Differentiate Method overloading and overriding.
4. Can we access parent class variables in child class by using super keyword?
5. Define Arithmetic Exception with example.
6. Name the two ways to create a thread in Java.
7. What is Thread Pool?
8. When a class must be declared as abstract?
9. What is a layout manager and what are different types of Layout managers available in java AWT?
10. Differentiate Hbox and VBox.

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PART B — (5 × 13 = 65 marks)

11. (a) (i) Differentiate between object oriented programming and procedure oriented programming. (7)

(ii) Write a Java program to find the greatest of three numbers. (6)

Or

(b) (i) Explain constructor with an example. (6)

(ii) Write a java program to display the grade of the students by using get() method to get marks and compute() method to compute the average and display() method to display the grade of the student. (7)

12. (a) (i) Write a java program for library interface with drawbook(), returnbook() and checkstatus() methods. (8)

(ii) Explain Method overloading with an example. (5)

Or

(b) (i) What are the advantages of using packages? (5)

(ii) Illustrate how to add classes in a package and how to access these classes in another package. (8)

13. (a) Create software for departmental stores to maintain the following details like item_no, item_description, requested quantity, cost price. Provide the options to update the stock. Calculate the selling price (SP = CP*20%).

Create an exception whenever the selling price of item exceeds the given amount.

Or

(b) (i) Discuss about try, catch and finally Keywords in Exception Handling with an example. (8)

(ii) List and explain Data types and their Corresponding Wrapper class. (5)

14. (a) (i) Explain string buffer class with example. (6)

(ii) Outline parameter type bounds with an example. (7)

Or

(b) Apply the String handling functions to do the following operations :

(i) Compare the two strings

(ii) Reverse the String - "Happy".

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15. (a) (i) List and explain the various layouts in java GUI. (8)

(ii) Explain the four types of buttons swing. (5)

Or

(b) Discuss the following with example:

(i) Mouse listener

(ii) Mouse motion listener

PART C — (1 × 15 = 15 marks)

16. (a) Create a Central Library management system with libraries in different locations in a city. Each Library can order a book from the central library and give it to the requesting customers. Availability of that book should be updated on each lending.

Consider each library as a thread that requests for a book for purchase from the central library. If the requested book count is less than zero, then central library provides an appropriate message to the appropriate requesting library. Implement using Multithreading.

Or

(b) With neat example, explain java AWT Menu bars and Menu items.

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 40389

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Third/Fourth/Fifth Semester

Computer Science and Engineering

CS 8392 – OBJECT ORIENTED PROGRAMMING

(Common to: Computer and Communication Engineering / Electrical and Electronics Engineering/ Electronics and Communication Engineering/ Electronics and Instrumentation Engineering/ Electronics and Telecommunication Engineering/ Instrumentation and Control Engineering/ Artificial Intelligence and Data Science/ Computer Science and Business System/ Information Technology)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What is encapsulation?
2. Define polymorphism.
3. When a class must be declared as abstract?
4. Outline the use of extends keyword in Java with syntax.
5. What is chained exception?
6. How character streams are defined?
7. Name the two ways to create a thread in Java.
8. What is synchronization?
9. Name the two methods defined in java.util. EventObject.
10. Draw the class hierarchy for Panel and Frame.

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PART B — (5 × 13 = 65 marks)

11. (a) (i) Outline the arithmetic operators in Java. (6)

(ii) Name the four integer types in Java and outline the bitwise operators that can be applied to the integer types. (7)

Or

(b) (i) Outline the iteration statements in Java with syntax and example. (9)

(ii) Outline the use of constructors and this keyword in Java. (4)

12. (a) (i) When a class hierarchy is created, in what order are the constructors for the classes that make up the hierarchy called? Outline with an example. (6)

(ii) Outline method overriding with an example. (7)

Or

(b) (i) Write a note on interfaces and present the syntax for defining an interface. (7)

(ii) Outline how interfaces are implemented in Java with an example. (6)

13. (a) (i) "Java exception handling is managed via five keywords". Name the five key words and present an outline of an exception-handling block with syntax. (6)

(ii) Present an outline of Java's checked exceptions defined in java. lang. (7)

Or

(b) What is InputStream? Present an outline of the methods defined by InputStream. (13)

14. (a) (i) Outline the states a thread can be in and specify the rules that determine when a context switch takes place. (7)

(ii) Present an outline of the methods used by Java for interprocess communication. (6)

Or

(b) (i) Why parameterized types are important? Outline Java generics with an example. (7)

(ii) Outline parameter type bounds with an example. (6)

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15. (a) What is AWTEvent class? Name the main event classes in java.awt.event and provide an outline of when they are generated. (13)

Or

(b) (i) Outline the use of setSize(), getSize( ), setVisible() and setTitle() methods when working with frame windows with their signature. (8)

(ii) Name the four types of buttons swing defines and present an outline of the same. (5)

PART C — (1 × 15 = 15 marks)

16. (a) Write a Java program to accept `n' names, store it in an array, sort the names in alphabetic order and display the result. Use classes and methods. (15)

Or

(b) Write a Java program to accept two square matrices, store them in an array, add the matrices and display the result. Use classes and methods. (15)

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : X 10313

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020/
APRIL/MAY 2021
Third/Fourth/Fifth Semester
Computer Science and Engineering
CS 8392 – OBJECT ORIENTED PROGRAMMING
(Common to : Computer and Communication Engineering/Electrical and Electronics Engineering/Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering/Instrumentation and Control Engineering/Information Technology)
(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Define encapsulation in Java.
2. What is a constructor ?
3. Exemplify the use of super keyword.
4. What are the differences between classes and interfaces ?
5. What is the purpose of finally clause ? Give example.
6. What are the uses of streams. What are the two types of streams ?
7. What is the need for synchronization ? How it can be implemented ?
8. How to create a single class, which automatically works with different types of data ? Give example.
9. Write the sequence in which method calls takes place when an applet is terminated ? Define those methods.
10. What are the two key features of Swing ?

PART – B **(5×13=65 Marks)**

11. a) i) How Java changed the internet ? **(9)**

ii) If semicolons are needed at the end of each statement, why does the comment line not end with a semicolon ? **(4)**

(OR)

b) What are the three categories of control statements used in Java ? Explain each category with example. **(13)**

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12. a) Write a Java program to calculate electricity bill using inheritance. The program should get the inputs of watts per hour and unit rate.

Check your program for the following case :

Assume a consumer consumes 5000 watts per hour daily for one month. Calculate the total energy bill of that consumer if per unit rate is 7 [1 unit = 1k Wh]. **(13)**

(OR)

b) What is interface ? With an example explain how to define and implement interface. **(13)**

13. a) Write a short note on the following topics :

- Uncaught exceptions. **(3)**
- Difference between throw and throws. Give example for both. **(5)**
- Chained exceptions. Give example. **(5)**

(OR)

b) How to perform reading and writing files ? Explain with example. **(13)**

14. a) Discuss the different states of thread in detail. **(13)**

(OR)

b) i) What is the purpose of thread priorities ? What are the different thread priorities that exist ? **(5)**

ii) What are bounded types ? Why it is used ? Give example. **(8)**

15. a) i) List any five different user interface components that can generate the events. **(5)**

ii) Demonstrate any four mouse event handlers with example. **(8)**

(OR)

b) Describe how to work with graphics to display information within window. **(13)**

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PART – C (1×15=15 Marks)

16. a) Write an AWT GUI application (called AWT Counter) as shown in the Figure 1. Each time the "Count" button is clicked, the counter value shall increase by 1.

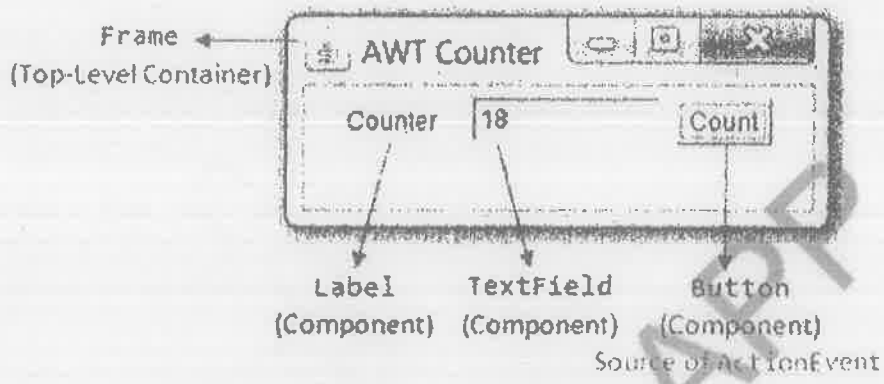

Figure 1

(OR)

b) Write an addressbook class that manages a collection of person object. An addressbook will allow a person to add, delete, or search for a person object in the address book.

- Add method : It should add a person object to the addressbook.
- Delete method: It should remove the specified person object from the book.
- Search method: It searches the address book for a specified person and returns the list of persons matching the specified criteria. The search can be done either by first name, last name or person id.

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INSTRUCTION

1. This is an important document and the faculty in-charge shall keep the entries up-to-date and correct.
2. Attendance shall be marked in the relevant column noting the date, month and period.
3. At the end of each period, the number of absentees should be clearly noted in the last row of the column in each page and installed as a token of check.
4. Topics covered in each period shall be recorded in the space provided.
5. Marks for tests shall be entered in the columns provided.
6. At the end of each report, the entries in the record shall be attested by the HOD of the faculty(the due dates for reports will be announced by the principal)
7. This register shall be handed over to the HOD of the faculty whenever the faculty member goes on long leave or when he/she resigns.
8. At the end of the semester, the faculty handling the subjects shall prepare the list of students who secured less than 75% attendance and send it to the Tutor/Chairman-class committee for consolidating the cases of shortage of attendance.
9. At the end of the semester the entries shall be checked and endorsed by the HOD of the faculty, then by the HOD of students and finally by the principal, signing in the spaces provided for this purpose. Finally the attendance and assessment records shall be under the safe custody of the principal.

Name of the Faculty	SANGEETHA. P		
Department	INFORMATION TECHNOLOGY		
Class	II-IT	**Branch Specialization (PG Subject)**	M.E-CSE
Semester	ODD		
Sub Code	CS3391	**Class Strength**	38
Sub Name	OBJECT ORIENTED PROGRAMMING		

Semester from 22-08-2022 **to** 17/12/22

COURSE TIME TABLE

Day	1	2	3	4	5	6	7	8
Mon				OOP				
Tue	OOP							OOP
Wed				OOP				
Thu								
Fri								OOP
Sat								

Internal Assessment Report	1	2	3
Internal Assessment Test Date	14/10/2022	23/12/2022	
Corrected test Papters returned on	15/10/2022	24/12/2022	
% of students with marks <50%	NIL	NIL	
% of students absent	0.075	0.150	
Initials of the HOD of faculty with Date			

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ATTENDANCE

	Reg.No	Name	M	AUGUST							
			D	22	23	24	27	29	30	2	3
			Hr	4	1.8	4	8	4	1.8	8	4
		Cumulative No. of period handled		1	2	3	4	5	6	7	8
1	73122120 5002	ASHWINI.S		a	a	a	a	a	a	a	a
2	73122120 5003	BHUVANESHWARAN.M		a	a	a	/	a	/	/	/
3	73122120 5004	BOOPATHI.C		a	a	a	/	a	/	/	a
4	73122120 5005	DEVIKA.A		/	/	/	a	/	/	/	/
5	73122120 5006	DHANALAKSHMI.C		a	a	a	a	a	a	a	a
6	73122120 5007	DHARSHINI.P		a	a	a	a	a	a	a	/
7	73122120 5008	DAYALAN.R		a	a	a	a	/	/	/	a
8	73122120 5009	DINESH.M		a	a	a	/	/	/	/	/
9	73122120 5010	DIVIYA.S		/	/	/	/	/	/	/	/
10	73122120 5011	KARTHICKRAJA G		a	a	a	a	/	/	/	/
11	73122120 5012	KAVI BHARATHI G		a	a	/	/	/	/	/	/
12	73122120 5013	KOWSALYA.G		a	/	/	/	a	/	/	/
13	73122120 5014	KOWSALYA.M		a	a	a	a	a	a	a	a
14	73122120 5015	KRISHNAN.S		/	/	/	/	/	/	/	/
15	73122120 5016	MADHANKUMAR.N		/	/	/	/	/	/	/	/
16	73122120 5017	MAHADEVAMMA.S		a	/	/	/	/	/	/	a
17	73122120 5018	MANI GANDAN.M		/	a	/	/	/	/	/	/
18	73122120 5019	MANILA.K		a	/	/	/	/	/	/	/
19	73122120 5020	MANOJKUMAR.S		/	a	/	/	/	/	/	/
20	73122120 5021	MAURIYA.D		a	a	a	/	/	/	/	/

	Reg.No	Name	M	SEPTEMBER																OCTOBER						
			D	5	6	7	9	16	17	19	20	21	23	24	26	27	28	30	7	8	10	11	12	14	15
			Hr	4	1.8	4	8	1.8	4	4	1.8	4	8	4	4	1.8	4	8	8	4	4	1.8	4	8	1.8
		Cumulative No. of period handled		9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	73122120 5002	ASHWINI.S		a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
2	73122120 5003	BHUVANESHWARAN.M		/	/	a	/	/	/	a	a	/	/	/	/	/	/	/	/	/	/	?	/	/	/
3	73122120 5004	BOOPATHI.C		a	/	a	/	a	/	/	/	/	/	/	a	/	/	/	/	/	/	/	/	/	/
4	73122120 5005	DEVIKA.A		/	/	/	/	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
5	73122120 5006	DHANALAKSHMI.C		a	a	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
6	73122120 5007	DHARSHINI.P		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
7	73122120 5008	DAYALAN.R		/	/	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
8	73122120 5009	DINESH.M		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
9	73122120 5010	DIVIYA.S		/	/	/	/	/	/	/	/	/	/	/	/	/	/	a	/	/	/	/	/	/	/
10	73122120 5011	KARTHICKRAJA G		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	a	a	a	/	/	/
11	73122120 5012	KAVI BHARATHI G		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
12	73122120 5013	KOWSALYA.G		/	/	a	/	/	/	a	/	a	/	/	/	/	/	/	/	/	/	/	/	/	a
13	73122120 5014	KOWSALYA.M		a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
14	73122120 5015	KRISHNAN.S		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
15	73122120 5016	MADHANKUMAR.N		/	/	/	a	a	/	/	/	/	/	/	/	/	/	a	/	/	/	/	/	/	/
16	73122120 5017	MAHADEVAMMA.S		/	/	/	/	/	a	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
17	73122120 5018	MANI GANDAN.M		/	/	/	/	/	/	/	/	/	a	/	/	/	/	/	/	/	/	/	/	/	/
18	73122120 5019	MANILA.K		/	/	/	/	/	/	a	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/
19	73122120 5020	MANOJKUMAR.S		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
20	73122120 5021	MAURIYA.D		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/

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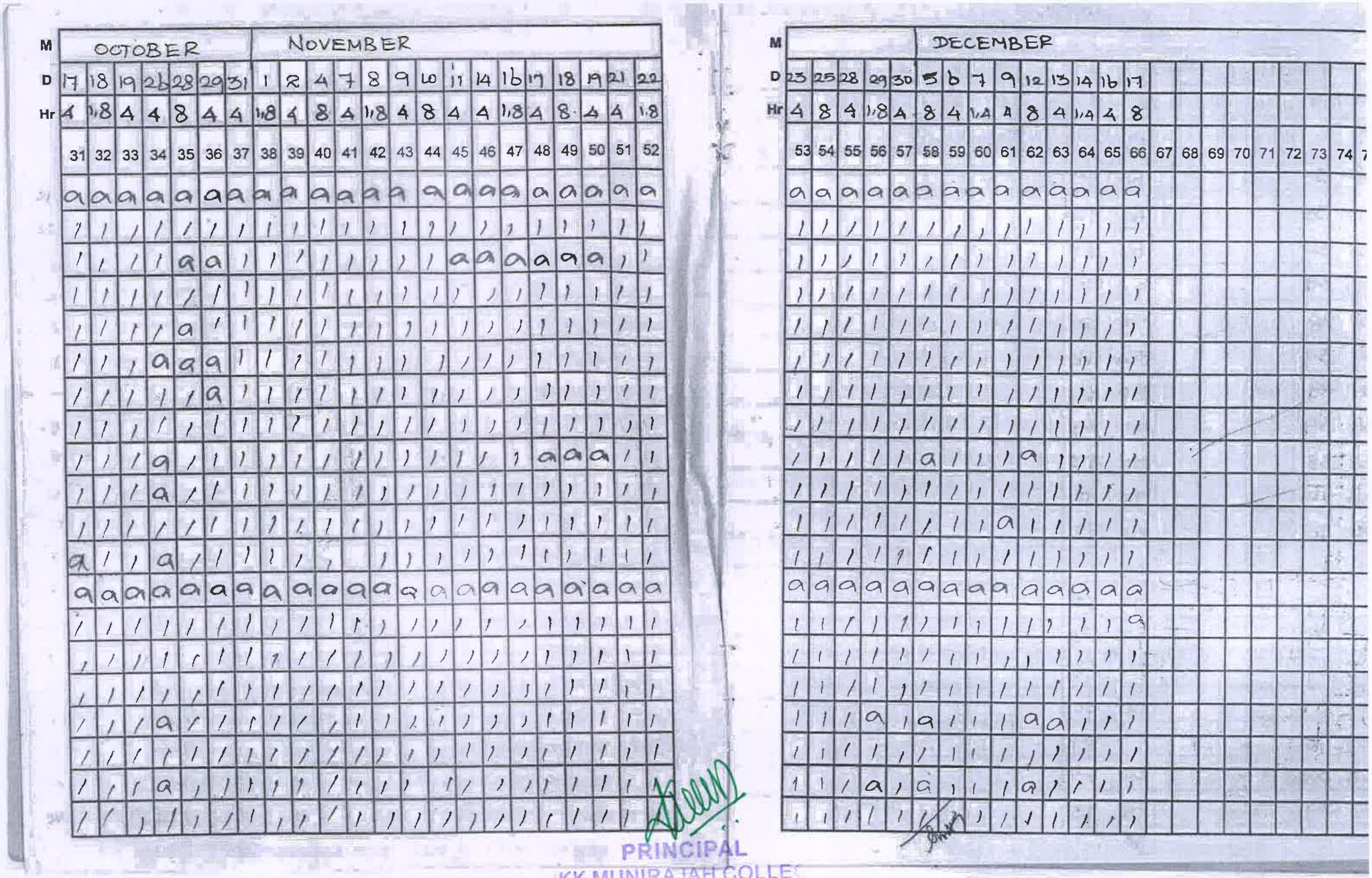

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ASSESSMENT

ASSIGNMENT / SEMINAR					IA Test 1	IA Test 2	IA Test 3	Model 1	Model 2	Attendance	Internal Attendance (Max.....)	Remarks
I	II	III	IV	V								
a	a				a	a						
36	39				60	65						
38	38				69	92						
37	39				68	79						
37	39				50	50						
37	38				50	50						
37	39				54	46						
38	39				50	46						
36	39				58	39						
38	38				50	45						
36	40				74	80						
40	40				50	70						
a	a				a	a						
37	39				72	83						
37	39				53	53						
36	39				51	55						
37	39				50	50						
39	40				50	59						
38	38				60	73						
37	39				58	83						

ATTENDANCE

	Reg.No.	Name	M	AUGUST						SEPTEMBER	
			D	20	23	24	27	29	30	2	3
			Hr	4	1.8	4	8	4	1.8	8	4
		Cumulative No. of period handled		1	2	3	4	5	6	7	8
21	73122120 5022	MEGAI ATHANGAMANI.M		/	/	/	/	/	/	/	/
22	73122120 5026	MOTHIP . I		a	a	a	a	a	a	a	a
23	73122120 5027	MOUNASAKTHI . G		a	a	a	a	a	a	a	a
24	73122120 5028	NANDHINI . S		a	/	/	/	/	/	/	/
25	73122120 5029	NAVEEN . S		a	a	a	a	/	/	/	a
26	73122120 5030	PANDEESWARAN . C.K		a	a	/	/	/	/	/	/
27	73122120 5031	PARTHIBAN . M		a	a	/	/	/	/	/	/
28	73122120 5032	RAKSITHA . B		a	a	a	/	/	/	/	/
29	73122120 5033	RATHNA . R		a	/	/	/	/	/	/	/
30	73122120 5034	RAVIKUMAR . M		a	a	a	a	/	/	/	/
31	73122120 5035	RITHIV . S		/	/	/	/	/	/	/	/
32	73122120 5036	ROHITH . V		a	/	/	/	/	/	/	/
33	73122120 5037	SHARANKUMAR . MV		/	a	/	/	/	/	/	/
34	73122120 5038	SIDDAPPA . S		a	a	a	a	a	a	a	a
35	73122120 5039	SUNDHARESWARI . V		/	/	/	/	/	/	/	/
36	73122120 5040	SUYARUPAT . C		a	a	a	/	/	/	/	/
37	73122120 5041	SWETHA . S		a	a	/	/	/	/	/	/
38	73122120 5042	TAMILSELVAN . M		/	/	/	/	a	a	/	a
39	73122120 5043	TAMILSELVI . R		a	/	/	/	/	/	/	/
40	73122120 5044	VISWANTHAN . R		a	a	a	a	/	/	/	/

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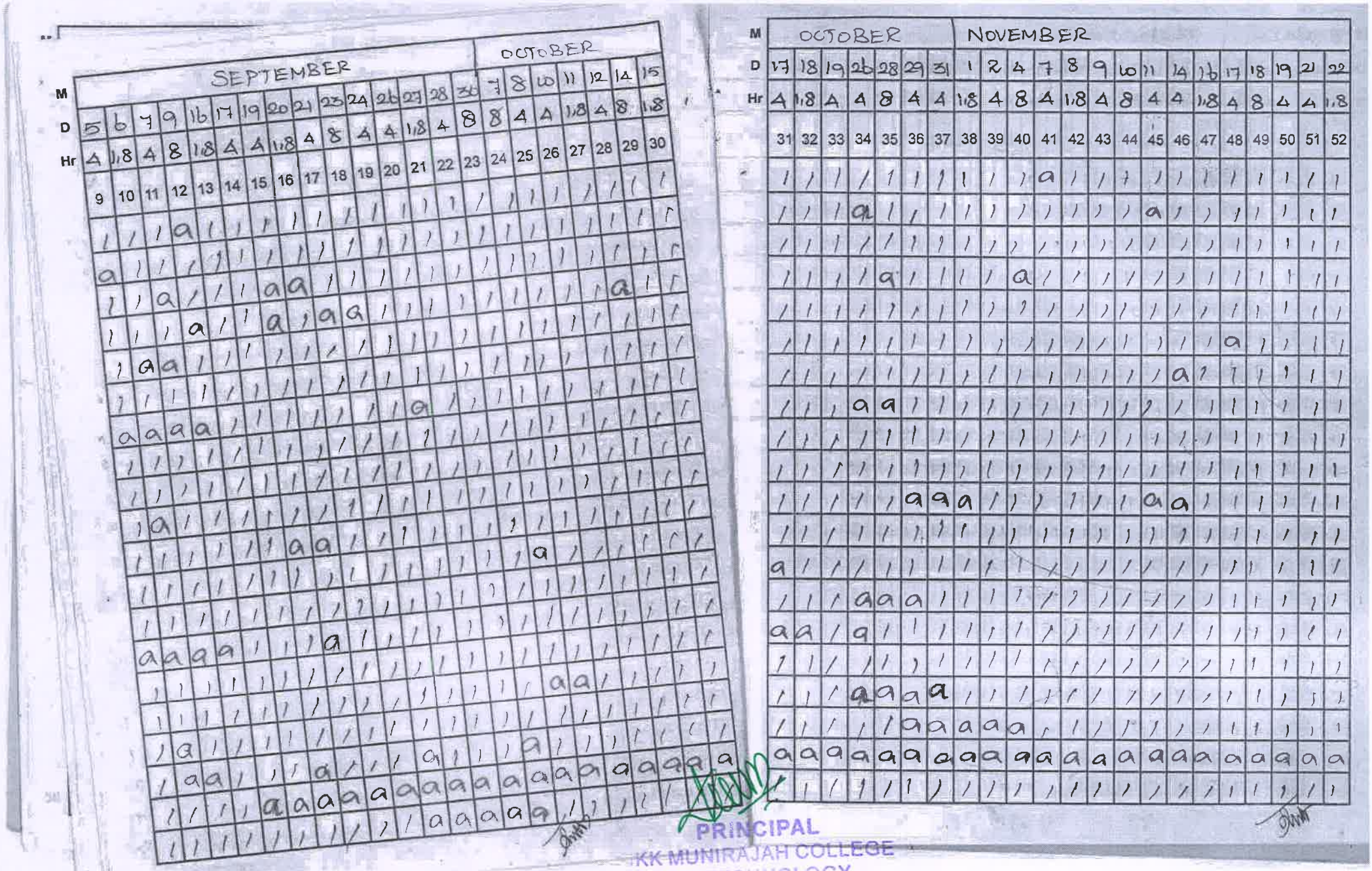
...ODE (Dt).



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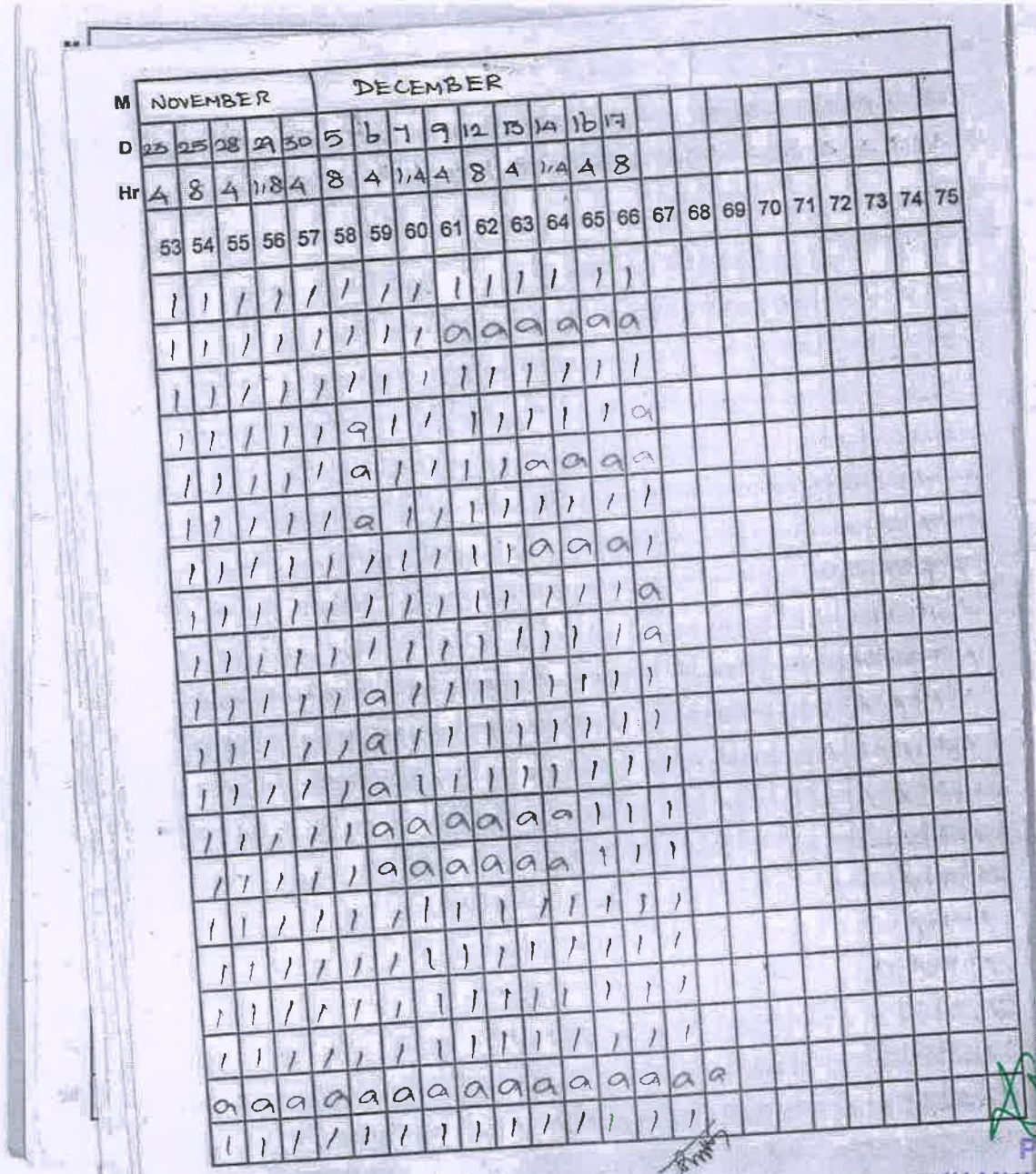
GOBI (Tk), ERODE (Dt).



M	NOVEMBER					DECEMBER																			
D	23	25	28	29	30	5	6	7	9	12	13	14	16	17											
Hr	A	8	A	1/8	A	8	A	1/A	A	8	A	1/A	A	8											
	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75		

ASSESSMENT

ASSIGNMENT / SEMINAR					IA Test 1	IA Test 2	IA Test 3	Model 1	Model 2	Attendance	Internal Attendance (Max.....)	Remarks
I	II	III	IV	V								
36	40				61	87						
40	39				50	39						
38	38				50	55						
38	38				a	52						
37	39				68	69						
36	40				50	47						
38	39				50	64						
38	40				62	70						
36	39				59	90						
38	40				56	76						
36	39				72	76						
36	39				52	53						
39	38				73	78						
37	40				50	46						
37	38				68	80						
37	38				50	74						
36	40				61	76						
38	40				52	65						
37	40				a	a						
38	40				69	85						

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ATTENDANCE

Reg.No	Name	M	AUGUST							
		D	22	23	24	27	29	30	2	3
		Hr	A	1&8	A	8	A	1&8	8	A
	Cumulative No. of period handled		1	2	3	4	5	6	7	8
41	13122120301 AHALYA . TC		/	/	/	/	/	/	/	/

M	SEPTEMBER															OCTOBER						
D	5	6	7	9	16	17	19	20	21	23	24	26	27	28	30	7	8	10	11	12	14	15
Hr	A	1&8	A	8	1&8	A	A	1&8	A	8	A	A	1&8	A	8	8	A	A	1&8	A	8	1&8
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/

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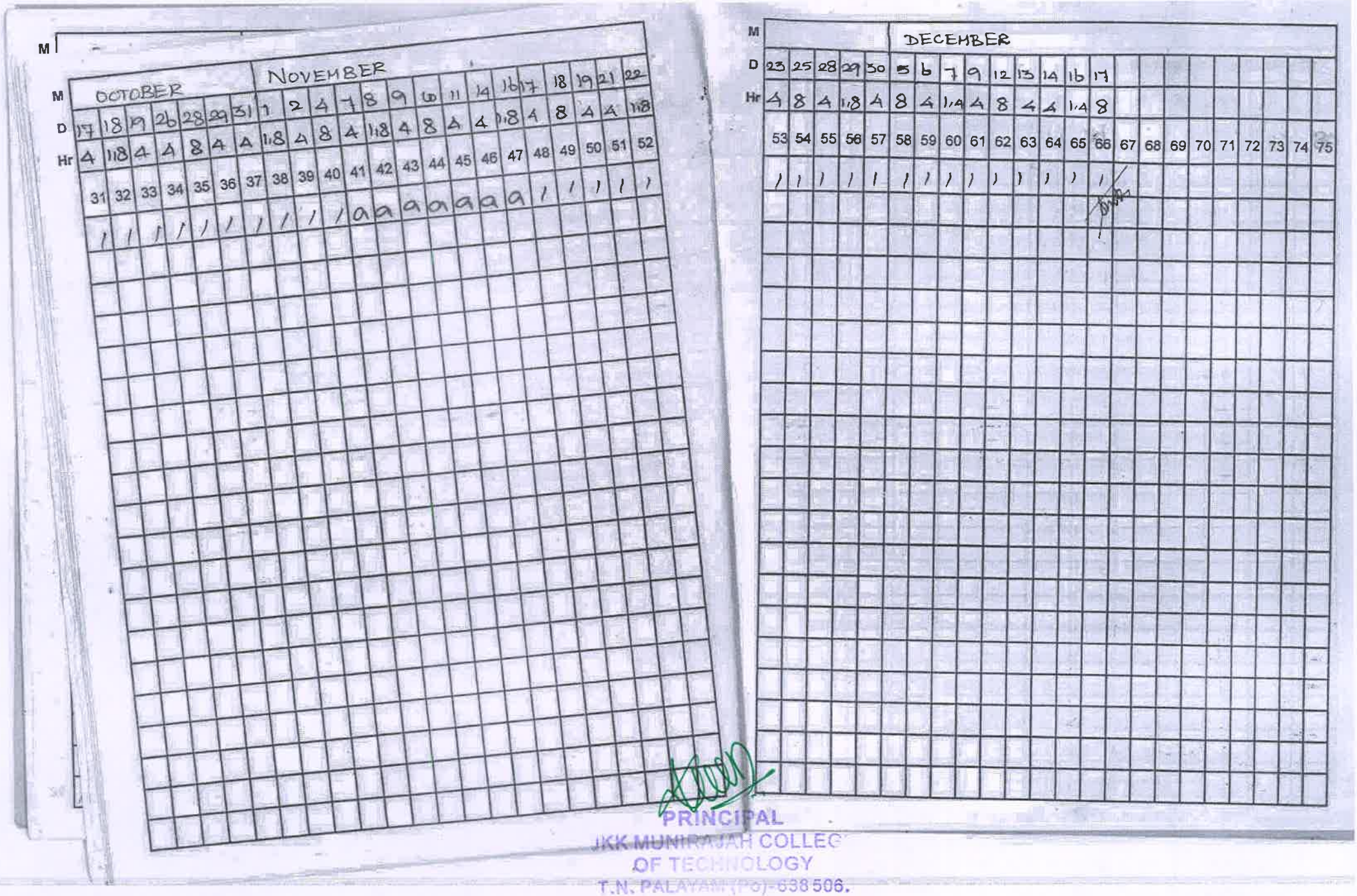

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GOBI (Tk), ERODE (Dt).

M

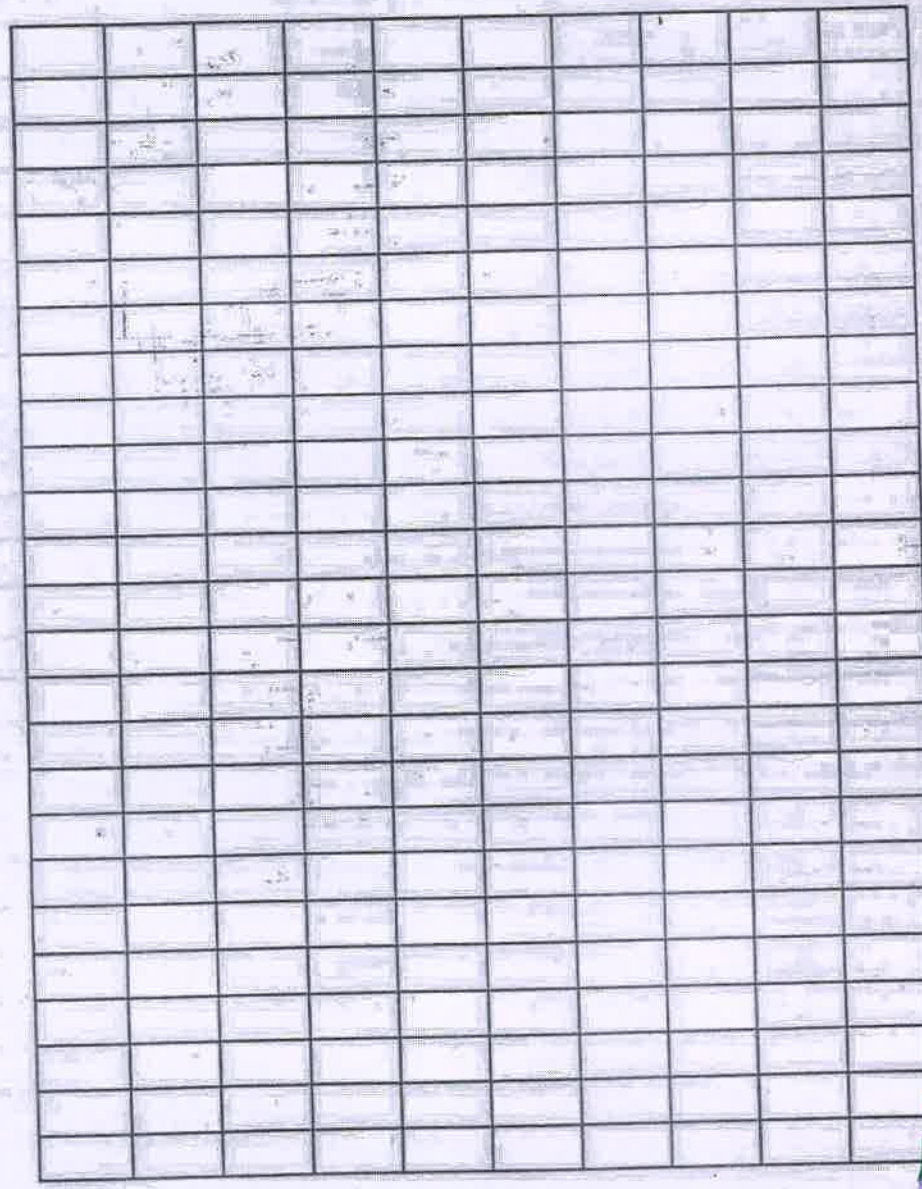
ASSESSMENT

ASSIGNMENT / SEMINAR					IA Test 1	IA Test 2	IA Test 3	Model 1	Model 2	Attendance	Internal Attendance (Max.....)	Remarks
I	II	III	IV	V								
38	40				68	61						

RECORD OF CLASS WORK

Roll No	Name					

RECORD OF CLASS WORK



RECORD OF CLASS WORK

Sl.No.	Date	Period	Topics Covered	Initials
			UNIT – I	
			INTRODUCTION TO OOP & JAVA	
1	22/8/22	4	Overview of OOP	Sangr
2	23/8/22	1,8	OOP Paradigms	Sangr
3	24/8/22	4	Features of OOP	Sangr
4	27/8/22	8	Java Buzzwords	Sangr
5	29/8/22	4	Overview of Java	Sangr
6	30/8/22	1,8	Data types, Variables & arrays	Sangr
7	2/9/22	8	Operators	Sangr
8	3/9/22	4	Control Statements	Sangr
9	5/9/22	4	Programming Structures in Java	Sangr
10	6/9/22	1,8	Defining classes in Java	Sangr
11	7/9/22	4	Constructors & Methods	Sangr
12	9/9/22	8	Access specifiers & static Members	Sangr
13	16/9/22	1,8	Java Doc comments	Sangr
			UNIT – II	
14	17/9/22	4	overloading Methods & objects as parameters	Sangr
15	19/9/22	4	Returning objects & static, Nested and inner classes	Sangr
16	20/9/22	1,8	Inheritance : Basics & Types of inheritance	Sangr

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[illegible]E (Dt).

RECORD OF CLASS WORK

Sl.No.	Date	Period	Topics Covered	Initials
17	23.9.22	8	Super keyword &	
		4	Method overriding	Sangr
18	26/9/22	4	Dynamic Method	
	27/9/22	1.8	Dispatch & Abstract	Sangr
	28/9/22	4	classes	Sangr
19	4/10/22	8	Final with Inheritance	
	8/10/22	4	& packages & Interfaces	Sangr
20	10/10/22	4	packages & package and	
			Member Access	Sangr
21	11/10/22	1.8	Importing packages	Sangr
22	12/10/22	4	Interfaces	Sangr
			UNIT – III	
			Exception Handling &	
			Multithreading	
23	14/10/22	8	Exception Handling	Sangr
	15/10/22	1.8	basics & Multiple	
			catch clauses	Sangr
24	17/10/22	4	Nested try statements	Sangr
25	18/10/22	1.8	Java's Built-in	
			Exceptions & user	
			defined Exception	Sangr
26	19/10/22	4	Multi threaded	Sangr
			programming: Java	

RECORD OF CLASS WORK

Sl.No.	Date	Period	Topics Covered	Initials
			Thread Model	
27	26/10/22	4	Creating a Thread & Multi	
			Thread	Sangr
28	28/10/22	8	priorities & Synchronization	Sangr
29	29/10/22	4	Inter Thread Communication	Sangr
30	31/10/22	4	Suspending & Resuming &	
			Stopping Threads	Sangr
31	1/11/22	1.8	Multi-Threading - Wrapper	
			& Autoboxing	Sangr
			UNIT – IV	
32	4/11/22	8	I/O, Generics & String	Sangr
	7/11/22	4	Handling	Sangr
33	8/11/22	1.8	I/O Basics	Sangr
34	9/11/22	4	Reading & Writing Console	Sangr
			I/O	
35	10/11/22	8	Reading & Writing Files	Sangr
36	11/11/22	4	Generics & Generic programing	Sangr
37	14/11/22	4	Generic classes & Methods	Sangr
38	16/11/22	1.8	Bounded Types	Sangr
39	17/11/22	4	Restrictions & Limitations	Sangr
40	18/11/20	8	String : Basic String	
			classes	Sangr
41	19/11/22	4	Methods & String	
			Buffer class	Sangr
			UNIT – V	

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RECORD OF CLASS WORK

Sl.No.	Date	Period	Topics Covered	Initials
			JAVA FX, EVENT HANDLING & COMPONENTS	
42	22/11/22	1,8	JavaFx Events & Controls	
			Event Basics	Sangar
43	23/11/22	4	Handling key & Mouse Events	Sangar
44	25/11/22	8	Controls: checkbox & Toggle Button	Sangar
45	28/11/22	4	Radio Buttons & list view	Sangar
46	29/11/22	1,8	Combo box & Choice box	Sangar
47	30/11/22	4	Text controls & scroll pane	Sangar
48	5/12/22	8	layouts & Flowpane	Sangar
	6/12/22	4	HBox and VBox	Sangar
49	7/12/22	1,4	Borderpane & Stackpane	Sangar
	9/12/22	4	& Grid pane	Sangar
50	12,13,14/12/22	8,4,1,4	Menu Basics & Menu	
			Menu bars	Sangar
51	16,17/12/22	4,8	Menu Item	Sangar

WORK HOURS

Period	Time
1	9.30 Am to 10.15 Am
2	10.15 Am to 11.00 Am
3	11.10 Am to 11.55 Am
4	11.55 Am to 12.40 Pm
5	1.25 Pm to 2.05 Pm
6	2.05 Pm to 2.45 Pm
7	2.55 Pm to 3.35 Pm
8	3.35 Pm to 4.15 Pm

To be signed at the end of semester

	Signature with Date
Faculty in-charge	Sangar
HOD of Faculty	
HOD of Student	
Principal	

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ANNA UNIVERSITY, CHENNAI - 600 025
TIME TABLE-B.E./B.Tech./B.Arch. DEGREE EXAMINATIONS
NOVEMBER/DECEMBER-2022
(REGULATIONS-2017)
CHOICE BASED CREDIT SYSTEM (CBCS)

Branch Name **B.Tech. Information Technology**

mes ter	*Subject Code*	*Subject Name*	*Exam Date*	*Session*
07	OEC754	Medical Electronics	30-DEC-22	F.N.
07	OIE751	Robotics	30-DEC-22	F.N.
07	OME752	Supply Chain Management	30-DEC-22	F.N.
07	OME753	Systems Engineering	30-DEC-22	F.N.
07	OMF751	Lean Six Sigma	30-DEC-22	F.N.
07	OEN751	Green Building Design	30-DEC-22	F.N.
07	OEE752	Introduction to Renewable Energy Systems	30-DEC-22	F.N.
07	OGI751	Climate Change and its Impact	30-DEC-22	F.N.
07	OCY751	Waste Water Treatment	30-DEC-22	F.N.
07	CS8792	Cryptography and Network Security	04-JAN-23	F.N.
08	CS8086	Soft Computing	09-DEC-22	A.N.
08	EC8093	Digital Image Processing	10-DEC-22	F.N.
08	IT8073	Information Security	10-DEC-22	F.N.
08	CS8085	Social Network Analysis	10-DEC-22	F.N.
08	CS8080	Information Retrieval Techniques	22-DEC-22	A.N.
08	CS8078	Green Computing	22-DEC-22	A.N.
08	GE8073	Fundamentals of Nano Science	22-DEC-22	A.N.
08	IT8078	Web Design and Management	22-DEC-22	A.N.
08	CS8084	Natural Language Processing	22-DEC-22	A.N.
08	IT8005	Electronic Commerce	22-DEC-22	A.N.
08	CS8074	Cyber Forensics	07-JAN-23	A.N.
08	GE8076	Professional Ethics in Engineering	07-JAN-23	A.N.

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Candidates registered for 8th semester (advance) courses in 7th semester may refer to 8th semester schedule

FN: FORENOON (10.00 A.M. TO 01.00 P.M.)
AN:AFTERNOON (2.00 P.M. TO 5.00 P.M.)

CONTROLLER OF EXAMINATIONS

ANNA UNIVERSITY, CHENNAI - 600 025
TIME TABLE-B.E./B.Tech./B.Arch. DEGREE EXAMINATIONS - NOVEMBER/DECEMBER-2022
(REGULATIONS-2021)
(Except for the candidates admitted in 2022)
CHOICE BASED CREDIT SYSTEM (CBCS)

Branch Name **B.Tech. Information Technology**

?mes ter	Subject Code	Subject Name	Exam Date	Session
01	CY3151	Engineering Chemistry	30-DEC-22	A.N.
01	HS3151	Professional English - I	03-JAN-23	A.N.
01	MA3151	Matrices and Calculus	05-JAN-23	A.N.
01	GE3151	Problem Solving and Python Programming	07-JAN-23	A.N.
01	PH3151	Engineering Physics	10-JAN-23	A.N.
02	BE3251	Basic Electrical and Electronics Engineering	30-DEC-22	F.N.
02	MA3251	Statistics and Numerical Methods	03-JAN-23	F.N.
02	HS3251	Professional English - II	05-JAN-23	F.N.
02	GE3251	Engineering Graphics	07-JAN-23	F.N.
02	CS3251	Programming in C	10-JAN-23	F.N.
02	PH3256	Physics for Information Science	12-JAN-23	F.N.
03	CS3351	Digital Principles and Computer Organization	29-DEC-22	F.N.
03	CS3391	Object Oriented Programming	04-JAN-23	F.N.
03	CS3352	Foundations of Data Science	06-JAN-23	F.N.
03	MA3354	Discrete Mathematics	09-JAN-23	F.N.
03	CD3291	Data Structures and Algorithms	11-JAN-23	F.N.

Branch Name **B.Tech. Handloom and Textile Technology**

?mes ter	Subject Code	Subject Name	Exam Date	Session
01	CY3151	Engineering Chemistry	30-DEC-22	A.N.
01	HS3151	Professional English - I	03-JAN-23	A.N.
01	MA3151	Matrices and Calculus	05-JAN-23	A.N.
01	GE3151	Problem Solving and Python Programming	07-JAN-23	A.N.
01	PH3151	Engineering Physics	10-JAN-23	A.N.
02	BE3252	Basic Electrical, Electronics and Instrumentation Engineering	30-DEC-22	F.N.
02	MA3251	Statistics and Numerical Methods	03-JAN-23	F.N.
02	HS3251	Professional English - II	05-JAN-23	F.N.
02	GE3251	Engineering Graphics	07-JAN-23	F.N.
02	CY3252	Chemistry for Textile Technologists	10-JAN-23	F.N.
02	PH3257	Physics for Textile Technologists	12-JAN-23	F.N.
03	TT3351	Preparatory process for woven Fabric Manufacture	29-DEC-22	F.N.
03	TT3352	Production of Textile Fibres	02-JAN-23	F.N.
03	TT3353	Structure and Properties of Textile Fibres	04-JAN-23	F.N.
03	TT3354	Technology of Pre-Spinning Process	06-JAN-23	F.N.
03	MA3357	Probability and Statistical Methods	09-JAN-23	F.N.
03	HT3301	Handloom Weaving Technology	11-JAN-23	F.N.

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FN: FORENOON (10.00 A.M. TO 01. 00 P.M.)
AN:AFTERNOON (02.00 P.M. TO 5.00 P.M.)

CONTROLLER OF EXAMINATIONS

ANNA UNIVERSITY, CHENNAI - 600 025
TIME TABLE-B.E./B.Tech./B.Arch. DEGREE EXAMINATIONS - NOVEMBER/DECEMBER-2022
(REGULATIONS-2021)
(Except for the candidates admitted in 2022)
CHOICE BASED CREDIT SYSTEM (CBCS)

Branch Name **B.Tech. Information Technology**

;mes ter	Subject Code	Subject Name	Exam Date	Session
01	CY3151	Engineering Chemistry	30-DEC-22	A.N.
01	HS3151	Professional English - I	03-JAN-23	A.N.
01	MA3151	Matrices and Calculus	05-JAN-23	A.N.
01	GE3151	Problem Solving and Python Programming	07-JAN-23	A.N.
01	PH3151	Engineering Physics	10-JAN-23	A.N.
02	BE3251	Basic Electrical and Electronics Engineering	30-DEC-22	F.N.
02	MA3251	Statistics and Numerical Methods	03-JAN-23	F.N.
02	HS3251	Professional English - II	05-JAN-23	F.N.
02	GE3251	Engineering Graphics	07-JAN-23	F.N.
02	CS3251	Programming in C	10-JAN-23	F.N.
02	PH3256	Physics for Information Science	12-JAN-23	F.N.
03	CS3351	Digital Principles and Computer Organization	29-DEC-22	F.N.
03	CS3391	Object Oriented Programming	04-JAN-23	F.N.
03	CS3352	Foundations of Data Science	06-JAN-23	F.N.
03	MA3354	Discrete Mathematics	09-JAN-23	F.N.
03	CD3291	Data Structures and Algorithms	11-JAN-23	F.N.

Branch Name **B.Tech. Handloom and Textile Technology**

;mes ter	Subject Code	Subject Name	Exam Date	Session
01	CY3151	Engineering Chemistry	30-DEC-22	A.N.
01	HS3151	Professional English - I	03-JAN-23	A.N.
01	MA3151	Matrices and Calculus	05-JAN-23	A.N.
01	GE3151	Problem Solving and Python Programming	07-JAN-23	A.N.
01	PH3151	Engineering Physics	10-JAN-23	A.N.
02	BE3252	Basic Electrical, Electronics and Instrumentation Engineering	30-DEC-22	F.N.
02	MA3251	Statistics and Numerical Methods	03-JAN-23	F.N.
02	HS3251	Professional English - II	05-JAN-23	F.N.
02	GE3251	Engineering Graphics	07-JAN-23	F.N.
02	CY3252	Chemistry for Textile Technologists	10-JAN-23	F.N.
02	PH3257	Physics for Textile Technologists	12-JAN-23	F.N.
03	TT3351	Preparatory process for woven Fabric Manufacture	29-DEC-22	F.N.
03	TT3352	Production of Textile Fibres	02-JAN-23	F.N.
03	TT3353	Structure and Properties of Textile Fibres	04-JAN-23	F.N.
03	TT3354	Technology of Pre-Spinning Process	06-JAN-23	F.N.
03	MA3357	Probability and Statistical Methods	09-JAN-23	F.N.
03	HT3301	Handloom Weaving Technology	11-JAN-23	F.N.

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ANNA UNIVERSITY, CHENNAI - 600 025
TIME TABLE-B.E./B.Tech./B.Arch. DEGREE EXAMINATIONS
NOVEMBER/DECEMBER-2022
(REGULATIONS-2017)
CHOICE BASED CREDIT SYSTEM (CBCS)

Branch Name **B.Tech. Information Technology**

emes ter	*Subject Code*	*Subject Name*	*Exam Date*	*Session*
01	HS8151	Communicative English	29-DEC-22	A.N.
01	GE8152	Engineering Graphics	09-JAN-23	A.N.
01	GE8151	Problem Solving and Python Programming	10-JAN-23	A.N.
01	CY8151	Engineering Chemistry	11-JAN-23	A.N.
01	PH8151	Engineering Physics	12-JAN-23	A.N.
01	MA8151	Engineering Mathematics - I	13-JAN-23	A.N.
02	MA8251	Engineering Mathematics - II	06-JAN-23	A.N.
02	BE8255	Basic Electrical, Electronics and Measurement Engineering	09-JAN-23	F.N.
02	PH8252	Physics for Information Science	10-JAN-23	F.N.
02	CS8251	Programming in C	11-JAN-23	F.N.
02	IT8201	Information Technology Essentials	12-JAN-23	F.N.
02	HS8251	Technical English	13-JAN-23	F.N.
03	CS8392	Object Oriented Programming	12-DEC-22	F.N.
03	EC8394	Analog and Digital Communication	14-DEC-22	A.N.
03	MA8351	Discrete Mathematics	15-DEC-22	F.N.
03	CS8391	Data Structures	21-DEC-22	A.N.
03	CS8351	Digital Principles and System Design	23-DEC-22	F.N.
04	CS8493	Operating Systems	12-DEC-22	A.N.
04	CS8451	Design and Analysis of Algorithms	13-DEC-22	A.N.
04	CS8492	Database Management Systems	26-DEC-22	A.N.
04	MA8391	Probability and Statistics	28-DEC-22	F.N.
04	GE8291	Environmental Science and Engineering	02-JAN-23	A.N.
04	CS8491	Computer Architecture	06-JAN-23	F.N.
05	MA8551	Algebra and Number Theory	08-DEC-22	F.N.
05	CS8494	Software Engineering	10-DEC-22	A.N.
05	CS8591	Computer Networks	13-DEC-22	F.N.
05	IT8501	Web Technology	15-DEC-22	A.N.
05	EC8691	Microprocessors and Microcontrollers	23-DEC-22	A.N.
05	OTL552	Digital Audio Engineering	29-DEC-22	F.N.
05	OCH551	Industrial Nanotechnology	29-DEC-22	F.N.
05	OCE551	Air Pollution and Control Engineering	29-DEC-22	F.N.
05	OBT554	Principles of Food Preservation	29-DEC-22	F.N.
05	OCE552	Geographic Information System	29-DEC-22	F.N.
05	OEI551	Logic and Distributed Control Systems	29-DEC-22	F.N.
05	OMF551	Product Design and Development	29-DEC-22	F.N.
05	OIM551	World Class Manufacturing	29-DEC-22	F.N.
05	OTL554	Wavelets and its Applications	29-DEC-22	F.N.
05	OMD553	Telehealth Technology	29-DEC-22	F.N.
05	OTL553	Telecommunication Network Management	29-DEC-22	F.N.

Candidates registered for 8th semester (advance) courses in 7th semester may refer to 8th semester schedule

FN: FORENOON (10.00 A.M. TO 01.00 P.M.)
AN:AFTERNOON (2.00 P.M. TO 5.00 P.M.)

CONTROLLER OF EXAMINATIONS

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
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GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY, CHENNAI - 600 025
TIME TABLE-B.E./B.Tech./B.Arch. DEGREE EXAMINATIONS
NOVEMBER/DECEMBER-2022
(REGULATIONS-2017)
CHOICE BASED CREDIT SYSTEM (CBCS)

Branch Name **B.Tech. Information Technology**

mes ter	*Subject Code*	*Subject Name*	*Exam Date*	*Session*
05	OEC552	Soft Computing	29-DEC-22	F.N.
05	OAN551	Sensors and Transducers	29-DEC-22	F.N.
05	OME553	Industrial Safety Engineering	29-DEC-22	F.N.
05	OMD552	Hospital Waste Management	29-DEC-22	F.N.
05	OBT553	Fundamentals of Nutrition	29-DEC-22	F.N.
05	OME551	Energy Conservation and Management	29-DEC-22	F.N.
05	OMD551	Basic of Biomedical Instrumentation	29-DEC-22	F.N.
05	OBT552	Basics of Bioinformatics	29-DEC-22	F.N.
06	IT8601	Computational Intelligence	08-DEC-22	A.N.
06	CS8592	Object Oriented Analysis and Design	17-DEC-22	F.N.
06	IT8602	Mobile Communication	17-DEC-22	A.N.
06	CS8092	Computer Graphics and Multimedia	21-DEC-22	F.N.
06	IT8072	Embedded Systems	22-DEC-22	F.N.
06	CS8072	Agile Methodologies	22-DEC-22	F.N.
06	GE8075	Intellectual Property Rights	22-DEC-22	F.N.
06	IT8076	Software Testing	22-DEC-22	F.N.
06	IT8001	Information Storage and Management	22-DEC-22	F.N.
06	CS8091	Big Data Analytics	05-JAN-23	A.N.
07	CS8791	Cloud Computing	09-DEC-22	F.N.
07	CS8088	Wireless Adhoc and Sensor Networks	14-DEC-22	F.N.
07	CS8079	Human Computer Interaction	14-DEC-22	F.N.
07	CS8073	C# and .Net Programming	14-DEC-22	F.N.
07	GE8071	Disaster Management	14-DEC-22	F.N.
07	CS8071	Advanced Topics on Databases	14-DEC-22	F.N.
07	MG8591	Principles of Management	16-DEC-22	F.N.
07	GE8074	Human Rights	20-DEC-22	F.N.
07	GE8072	Foundation Skills in Integrated Product Development	20-DEC-22	A.N.
07	IT8075	Software Project Management	27-DEC-22	A.N.
07	IT8074	Service Oriented Architecture	27-DEC-22	A.N.
07	GE8077	Total Quality Management	27-DEC-22	A.N.
07	IT8002	Web Development Frameworks	27-DEC-22	A.N.
07	CS8082	Machine Learning Techniques	28-DEC-22	A.N.
07	CS8081	Internet of Things	28-DEC-22	A.N.
07	OBM751	Basics of Human Anatomy and Physiology	30-DEC-22	F.N.
07	OBM752	Hospital Management	30-DEC-22	F.N.
07	OBT753	Introduction of Cell Biology	30-DEC-22	F.N.
07	OCE751	Environmental and Social Impact Assessment	30-DEC-22	F.N.
07	OCH752	Energy Technology	30-DEC-22	F.N.
07	OEC751	Electronic Devices	30-DEC-22	F.N.

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Candidates registered for 8th semester (advance) courses in 7th semester may refer to 8th semester schedule

FN: FORENOON (10.00 A.M. TO 01.00 P.M.)
AN:AFTERNOON (2.00 P.M. TO 5.00 P.M.)

CONTROLLER OF EXAMINATIONS

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

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Accredited by NAAC with "A" grade

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REQUISITION LETTER

From,

Head of the Department,

Information Technology,

JKK Munirajah College of Technology,

T.N.Palayam.

To,

The Principal,

JKK Munirajah College of Technology,

T.N.Palayam.

Respected Sir,

Sub: Seeking permission for conducting a Certificate Program- Reg

We have planned to conduct a certificate program for II, III and IV year Information Technology students on **"ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH"** from 12.09.2022 to 17.09.2022 by Program Coordinator **Mrs.SANGEETHA.P/ASSISSTANT PROFESSOR**. So, I request you to kindly provide permission to conduct the certificate program.

Thanking You,

Permitted

5/9/22

Yours Truly,

Place: T.N.Palayam

Date: 05.09.2022

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JKKMCT/CIRCULAR/SEP-22 07/09/2022

CIRCULAR

The Department of Information Technology is planning to organize a Certificate Program on **"ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH"** (36 Hours) for the benefit of the students from **12.09.2022** (Monday) to **17.09.2022** (Saturday). Students those who are willing to attend the Program can enroll their names to their class in-charges respectively on or before **10.09.2022.**

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY * THOOKKANAICKENPALAYAM * Gobi (Tk), Erode (Dt)

7.9.22

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Copy To,
All the **HODs and Staff Members,**
All the **Students,**
Notice **Board, File**

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DEPARTMENT OF INFORMATION TECHNOLOGY

PROGRAM SYLLABUS

Name of the Certificate Program: ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH

Program Code : 22ITADMSFEI01

Name of the Program Coordinator: Mrs.P.SANGEETHA

Academic Year: 2022-2023

Program Contents **Total Hours: 36**

Chapter 1: Introduction to Digital Marketing for Engineers

- Overview of digital marketing principles
- Importance of digital marketing for engineering innovations
- Understanding the engineering audience and their needs
- Case studies of successful engineering-related digital marketing campaigns

Chapter 2: Crafting a Marketing Strategy for Engineering Innovations

- Market research methodologies for engineering products/services
- Defining target audience personas in engineering sectors
- Setting marketing objectives for engineering innovations
- Identifying key performance indicators (KPIs) for engineering campaigns

Chapter 3: Content Creation and Optimization for Technical Audiences

- Creating compelling content for engineering innovations
- SEO strategies for technical content and engineering websites
- Content optimization for engineering-related keywords and search intent
- Leveraging visual and technical content for marketing purposes

Chapter 4: Social Media and Community Engagement for Engineers

- Overview of social media platforms for engineering industries
- Building and engaging engineering communities on social media
- Strategies for leveraging LinkedIn, Twitter, and other platforms for engineering innovations

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- Live demonstrations and case studies of successful engineering social media campaigns

Chapter 5: Data Analytics and Performance Measurement in Engineering Marketing

- Understanding analytics tools and metrics specific to engineering campaigns
- Analyzing and interpreting data for engineering marketing success
- A/B testing and optimization techniques for engineering innovations
- Reporting and presenting digital marketing campaign results to stakeholders

Chapter 6: Developing and Presenting a Digital Marketing Campaign for an Engineering Innovation

- Group project: Designing a digital marketing campaign for an engineering product/service
- Creating campaign materials: ads, landing pages, social media content, etc.
- Presenting the campaign strategy, implementation plan, and expected outcomes
- Feedback session and discussions on refining campaign strategies

Prepared by:

Name: Mrs.P.SANGEETHA

Designation: ASSISSTANT PROFESSOR

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PROGRAM COORDINATOR **HOD** **PRINCIPAL**

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PROGRAM SCHEDULE

Name of the Certificate Program: ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH

Program Code : 22ITADMSFEI01

Name of the Program Coordinator: Mrs.P.SANGEETHA

Program Period : 12.09.2022 to 17.09.2022

Date/ Time	9:30AMto 11:30AM (2 Hours)	BREAK	11.45 AM to 12.45PM (1 Hour)	LUNCH	1:30 PM to 4.30 PM (3 Hours)
12-09-2022	Overview of digital marketing principles		Importance of digital marketing for engineering innovations		Understanding the engineering audience and their needs Case studies of successful engineering-related digital marketing campaigns
13-09-2022	Market research methodologies for engineering products/services		Defining target audience personas in engineering sectors		Setting marketing objectives for engineering innovations, Identifying key performance indicators (KPIs) for engineering campaigns
14-09-2022	Creating compelling content for engineering innovations		SEO strategies for technical content and engineering websites		Content optimization for engineering-related keywords and search intent Leveraging visual and technical content for marketing purposes
15-09-2022	Overview of social media platforms for engineering industries		Building and engaging engineering communities on social media		Strategies for leveraging LinkedIn, Twitter, and other platforms for engineering innovations, Live demonstrations and case studies of successful engineering social media campaigns
16-09-2022	Understanding analytics tools and metrics specific to engineering campaigns		Analyzing and interpreting data for engineering marketing success		A/B testing and optimization techniques for engineering innovations, Reporting and presenting digital marketing campaign results to stakeholders
17-09-2022	Group project: Designing a digital marketing campaign for an engineering product/service.		Creating campaign materials: ads, landing pages, social media content, etc.		Presenting the campaign strategy, implementation plan, and expected outcomes Feedback session and discussions on refining campaign strategies

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DEPARTMENT OF INFORMATION TECHNOLOGY

RESOURCE PERSON PROFILE

Title of the Programme	ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH
Duration and Timing of the Programme	36 Hours and 9.30 AM to 4.30 PM
Name of the Resource Person	Mrs.P.SANGEETHA
Photo Image of the Resource Person	
E-mail	sangeethap@jkkmct.edu.in
Mobile No:	9677182957
Designation	ASSISSTANT PROFESSOR
Official Address	Moonanjavadi, Umareddiyur(PO), Anthiyur(TK(, Erode(DT)-638311
Educational Qualification	B.E-CSE,M.E-CSE
Experience	FOUR YEARS
Field of Interest	CYBER SECURITY, COMPUTER NETWROKS

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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2022-2023

WILLING STUDENTS NAMELIST

CERTIFICATE PROGRAM ON ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH

S.NO	REGISTER NUMBER	NAME	WILLINGNESS		
			YES	NO	SIGN
IV YEAR					
1	731219205002	GOWTHAM.H	✓		
2	731219205004	MAHANTESH.S	✓		
3	731219205005	NANDHINI.R	✓		
4	731219205007	NAVEEN.S	✓		
5	731219205008	NINGARAJU.S	✓		
6	731219205009	NITHYA.K	✓		
7	731219205010	PRABHU.M	✓		
8	731219205011	PRIYADHARSINI.T	✓		
9	731219205018	VAIDEVI.M	✓		
10	731219205019	VAIGAIRAJ.M	✓		
III YEAR					
11	731220205001	AJAYSRI. A	✓		
12	731220205004	DEEPAK.A	✓		

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13	731220205007	DHINESHKUMAR .M	✓		
14	731220205008	DINESH.S	✓		
15	731220205009	GOKUL.S	✓		
16	731220205011	KALAISELVI.K	✓		
17	731220205012	KAVIN.P	✓		
18	731220205013	LENA TAMILVANAN.G		✓	
19	731220205014	MAYILRAJ.V	✓		
20	731220205015	MUTHUKUMAR.G	✓		
21	731220205016	PANDIYARAJ.C	✓		
22	731220205017	PARVATHY.A	✓		
23	731220205018	PRIYANKA.S	✓		
24	731220205019	RAMKUMAR.R	✓		
25	731220205020	RAVI SANKARAN.N	✓		
26	731220205021	SHIJIN KUMAR.K.G	✓		
27	731220205023	SRIRAM.V		✓	
28	731220205024	THANGESHWARI.G	✓		
29	731220205301	POORANESHWARAN.N	✓		
30	731220205302	RAVINDHIRAN.R	✓		
31	731220205303	SHILPA.C	✓		
II YEAR					
32	731221205003	BHUVANESWARAN M	✓		

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33	731221205004	BOOPATHI C	✓		
34	731221205005	DEVIKA A	✓		
35	731221205006	DHANALAKSHMI C	✓		
36	731221205007	DHARSHINI P	✓		
37	731221205008	DHAYALAN R	✓		
38	731221205009	DINESH M	✓		
39	731221205010	DIVYA S	✓		
40	731221205011	KARTHICKRAJA G		✓	
41	731221205012	KAVIBHARATHI G	✓		
42	731221205013	KOWSALYA G	✓		
43	731221205015	KRISHNAN S	✓		
44	731221205016	MADHANKUMAR N	✓		
45	731221205017	MAHADEVAMMA S	✓		
46	731221205019	MANIGANDAN M		✓	
47	731221205020	MANILA K	✓		
48	731221205021	MANOJKUMAR S	✓		
49	731221205022	MAVURIYA D	✓		
50	731221205023	MEGALATHANGAMANI M	✓		
51	731221205026	MOTHIR L	✓		
52	731221205027	MOUNASAKTHI G		✓	
53	731221205028	NANDHINI S	✓		

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GOBI (Tk), ERODE (Dt).

54	731221205029	NAVEEN S	✓		
55	731221205030	PANDEESWARAN C K	✓		
56	731221205031	PARTHIBAN M	✓		
57	731221205032	RAKSHITHA B	✓		
58	731221205033	RATHNA R	✓		
59	731221205034	RAVIKUMAR M	✓		
60	731221205035	RITHIK S	✓		
61	731221205036	ROHITH V	✓		
62	731221205037	SHARANKUMAR M V	✓		
63	731221205038	SIDDAPPA S		✓	
64	731221205039	SUNDHARESWARI V	✓		
65	731221205040	SUYAMBURAJ C	✓		
66	731221205041	SWETHA S	✓		
67	731221205042	TAMILSELVAN M	✓		
68	731221205044	YUSWANTHRAA R	✓		
69	731221205301	AHALYA J C	✓		

PROGRAM COORDINATOR

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DEPARTMENT OF INFORMTION TECHNOLOGY

ACADEMIC YEAR 2022-2023

CERTIFICATE PROGRAM ON ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH

ENROLLED STUDENTS NAMELIST

DATE: 12.09.2022 to 17.09.2022

S.NO	REGISTER NUMBER	NAME
IV YEAR		
1	731219205002	GOWTHAM.H
2	731219205004	MAHANTESH.S
3	731219205005	NANDHINI.R
4	731219205007	NAVEEN.S
5	731219205008	NINGARAJU.S
6	731219205009	NITHYA.K
7	731219205010	PRABHU.M
8	731219205011	PRIYADHARSINI.T
9	731219205018	VAIDEVI.M
10	731219205019	VAIGAIRAJ.M
III YEAR		
11	731220205001	AJAYSRI. A
12	731220205004	DEEPAK.A
13	731220205007	DHINESHKUMAR .M
14	731220205008	DINESH.S
15	731220205009	GOKUL.S
16	731220205011	KALAISELVI.K
17	731220205012	KAVIN.P
18	731220205014	MAYILRAJ.V
19	731220205015	MUTHUKUMAR.G
20	731220205016	PANDIYARAJ.C
21	731220205017	PARVATHY.A
22	731220205018	PRIYANKA.S

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23	731220205019	RAMKUMAR.R
24	731220205020	RAVI SANKARAN.N
25	731220205021	SHIJIN KUMAR.K.G
26	731220205024	THANGESHWARI.G
27	731220205301	POORANESHWARAN.N
28	731220205302	RAVINDHIRAN.R
29	731220205303	SHILPA.C
II YEAR		
30	731221205003	BHUVANESWARAN M
31	731221205004	BOOPATHI C
32	731221205005	DEVIKA A
33	731221205006	DHANALAKSHMI C
34	731221205007	DHARSHINI P
35	731221205008	DHAYALAN R
36	731221205009	DINESH M
37	731221205010	DIVYA S
38	731221205012	KAVIBHARATHI G
39	731221205013	KOWSALYA G
40	731221205015	KRISHNAN S
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45	731221205022	MAVURIYA D
46	731221205023	MEGALATHANGAMANI M
47	731221205026	MOTHIR L
48	731221205028	NANDHINI S
49	731221205029	NAVEEN S
50	731221205030	PANDEESWARAN C K
51	731221205031	PARTHIBAN M
52	731221205032	RAKSHITHA B
53	731221205033	RATHNA R
54	731221205034	RAVIKUMAR M

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55	731221205035	RITHIK S
56	731221205036	ROHITH V
57	731221205037	SHARANKUMAR M V
58	731221205039	SUNDHARESWARI V
59	731221205040	SUYAMBURAJ C
60	731221205041	SWETHA S
61	731221205042	TAMILSELVAN M
62	731221205044	YUSWANTHRAA R
63	731221205301	AHALYA J C

PROGRAM COORDINATOR

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ACADEMIC YEAR 2022-2023

CERTIFICATE PROGRAM ON ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH

ATTENDANCE SHEET

S.NO	REGISTER NO	NAME	ATTENDANCE OF THE PARTICIPANTS											
			12/9/22		13/9/22		14/9/22		15/9/22		16/9/22		17/9/22	
			FN	AN	FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
IV YEAR														
1	731219205002	GOWTHAM.H	/	/	/	/	/	/	/	/	/	/	/	/
2	731219205004	MAHANTESH.S	/	/	/	/	/	/	/	/	/	/	/	/
3	731219205005	NANDHINI.R	/	/	/	/	/	/	/	/	/	/	/	/
4	731219205007	NAVEEN.S	/	/	/	/	/	/	/	/	/	/	/	/
5	731219205008	NINGARAJU.S	/	/	/	/	/	/	/	/	/	/	/	/
6	731219205009	NITHYA.K	/	/	/	/	/	/	/	/	/	/	/	/
7	731219205010	PRABHU.M	/	/	/	/	/	/	/	/	/	/	/	/
8	731219205011	PRIYADHARSINI.T	/	/	/	/	/	/	/	/	/	/	/	/
9	731219205018	VAIDEVI.M	/	/	/	/	/	/	/	/	/	/	/	/
10	731219205019	VAIGAIRAJ.M	/	/	/	/	/	/	/	/	/	/	/	/
III YEAR														
11	731220205001	AJAYSRI. A	/	/	/	/	/	/	/	/	/	/	/	/

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12	731220205004	DEEPAK.A												
13	731220205007	DHINESHKUMAR .M												
14	731220205008	DINESH.S												
15	731220205009	GOKUL.S												
16	731220205011	KALAISELVI.K												
17	731220205012	KAVIN.P												
18	731220205014	MAYILRAJ.V												
19	731220205015	MUTHUKUMAR.G												
20	731220205016	PANDIYARAJ.C												
21	731220205017	PARVATHY.A												
22	731220205018	PRIYANKA.S												
23	731220205019	RAMKUMAR.R												
24	731220205020	RAVI SANKARAN.N												
25	731220205021	SHIJIN KUMAR.K.G												
26	731220205024	THANGESHWARI.G												
27	731220205301	POORANESHWARAN.N												
28	731220205302	RAVINDHIRAN.R												
29	731220205303	SHILPA.C												
II YEAR														
30	731221205003	BHUVANESWARAN M												

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31	731221205004	BOOPATHI C													
32	731221205005	DEVIKA A													
33	731221205006	DHANALAKSHMI C													
34	731221205007	DHARSHINI P													
35	731221205008	DHAYALAN R													
36	731221205009	DINESH M													
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38	731221205012	KAVIBHARATHI G													
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42	731221205017	MAHADEVAMMA S													
43	731221205020	MANILA K													
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46	731221205023	MEGALATHANGAMANI M													
47	731221205026	MOTHIR L													
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50	731221205030	PANDEESWARAN C K													
51	731221205031	PARTHIBAN M													

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52	731221205032	RAKSHITHA B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
53	731221205033	RATHNA R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
54	731221205034	RAVIKUMAR M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
55	731221205035	RITHIK S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
56	731221205036	ROHITH V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
57	731221205037	SHARANKUMAR M V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
58	731221205039	SUNDHARESWARI V	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
59	731221205040	SUYAMBURAJ C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
60	731221205041	SWETHA S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
61	731221205042	TAMILSELVAN M	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
62	731221205044	YUSWANTHRAA R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
63	731221205301	AHALYA J C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TOTAL NO OF STUDENTS PRESENT			62	62	62	62	62	62	62	62	63	63	63	63
TOTAL NO OF STUDENTS ABSENT			01	01	01	01	01	01	01	01	NIL	NIL	NIL	NIL
SIGNATURE OF THE PROGRAM COORDINATOR														
SIGNATURE OF THE HOD														

PROGRAM COORDINATOR **HOD** **PRINCIPAL**

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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2022-2023

ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH

ASSESSMENT

ANSWER ALL QUESTIONS (30*1=30 MARKS)

1. Which of these is true about marketing?

a) Marketing is used to promote the product and services

b) Marketing is concerned about the sales only

c) Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.

d) Marketing considers only the needs of the organization and not the society

2. Which one is not a part of the 4 Ps?

a) Product

b) People

c) Price

d) Place

3. Who is the Father of Modern Marketing?

a) Philip Kotler

b) Peter F Drucker

c) Abraham Maslow

d) Raymond Kroc

4. ____defined marketing as the science and art of exploring, creating, and delivering value to satisfy the needs of a target market at a profit?

a) Steve Jobs

b) Philip Kotler

c) Peter Drucker

d) Abraham Maslow

5. The term "Marketing" refers to?

a) Promotion of the product

b) Focusing on sales and profit

c) Strategizing and implementing the organization process

d) Set of activities to deliver customer value and satisfaction

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6. ____ is the key term in AMA's definition of marketing?

a) Sales

b) Promotion

c) Value

d) Profit

7. Why must the marketers monitor the competitor's activities?

a) The competitor may destroy the organization

b) The competitor may threaten the monopoly position of the company

c) New offerings of a competitor may need alterations in one or more components of the company's marketing mix

d) The competitor may be violating the law to gain an advantage

8. Different price points for a different level of quality for a company's related products is a part of which pricing strategy?

a) Product line pricing

b) Incremental pricing

c) Optional product pricing

d) By-product pricing

9. In today's time marketing must be understood and developed as?

a) Getting the first mover's advantage

b) Creating value for the customers

c) Pushing for higher sales and profits

d) Creating innovative products

10. Which one of these is an appropriate definition of "want"?

a) The desires of consumers

b) Needs related to society

c) Basic human needs

d) Needs directed to the product

11. In the evolution of marketing the production period ended in ?

a) Late 1800s

b) After the second world war

c) In the 1920s

d) Early 20th century

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12. According to Philip Kotler marketing is____?

a) A science

b) An art

c) Both science and art

d) None of the above

13. Which concept holds that consumers will favor the products that are easily available at an affordable price?

a) Production concept

b) Product concept

c) Marketing concept

d) Production cost concept

14. What does the term "marketing" refer to?

a) New product development

b) Advertising and other promotional activities

c) Achieving sales and profit targets

d) Creating customer value and satisfaction

15. Which part of the consumer's income interests the marketers?

a) Gross Income

b) Disposable Income

c) Inflationary Income

d) Discretionary Income

16. Catalogues, sponsored events, and digital media presence are closely associated with the marketing mix activity of?

a) Product development

b) Pricing

c) Promotion

d) Sales

17. Early adopters and opinion leaders tend to?

a) Buy new products in their circles first and voice their opinion

b) Buy tried and tested products

c) Being from upper class, users from other classes are followe

d) Don't take risks easily

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18. To achieve market expansion a company must?

a) Use distribution channels more effectively

b) Use advertising campaigns more effectively

c) Price their products more strategically

d) All of the above

19. In an organization strategic marketing planning must begin with?

a) Hiring a senior planning consultant

b) Establishing organizational goals and objectives

c) Writing the mission statement

d) Writing the vision statement

20. In the service industry how many Ps comprise the marketing mix?

a) 4 Ps

b) 7 Ps

c) 10 Ps

d) 8 Ps

21. Which period worked on the marketing philosophy of "A good product will sell itself"?

a) Marketing

b) Production

c) Sales

d) Relationship

22. Which of the following describes "diversification"?

a) New products in new markets

b) New products in existing markets

c) Existing products in an existing market

d) Existing products in new markets

23. Which traits are desired of marketers today?

a) Only creativity

b) Only critical thinking

c) Both creativity and critical thinking

d) Neither creativity nor critical thinking

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24. What is motive development?

a) The imbalance between the customer's actual and desired state in which gap or problem-solving is recognized

b) The gap between the customer's current state and past state

c) The balance between the customer's actual and desired state

d) The gap between the customer's and his colleague's current state

25. Producers, wholesalers, and retailers act as a unified system to form a?

a) Vertical marketing system

b) Horizontal marketing system

c) Traditional marketing system

d) Hierarchical marketing system

26. Select the strategic marketing planning tool?

a) A BCG matrix

b) Market analysis

c) Consumer analysis and scanning model

d) Market vulnerability/business opportunity analysis

27. Achieving strategic marketing objectives using marketing plans and strategies is called?

a) Target achievement

b) Marketing implementation

c) Market penetration

d) Goal setting

28. Using a successful brand name to launch a new product in a different category is called?

a) Line extension

b) Brand expansion

c) Brand extension

d) Branding

29. The marketer focuses on product awareness, trial, and expansion in this stage of the product life cycle?

a) Growth Stage

b) Decline Stage

c) Maturity stage

d) Introduction stage

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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2022-2023

CERTIFICATE PROGRAM ON ADVANCED DIGITAL MARKETING STRATEGIES FOR ENGINEERING INNOVATIONS: A COMPREHENSIVE APPROACH

STUDENTS MARKLIST

DATE: 12.09.2022 to 17.09.202

S.NO	REGISTER NUMBER	NAME	MARKS
		IV YEAR	
1	731219205002	GOWTHAM.H	96
2	731219205004	MAHANTESH.S	95
3	731219205005	NANDHINI.R	81
4	731219205007	NAVEEN.S	83
5	731219205008	NINGARAJU.S	97
6	731219205009	NITHYA.K	78
7	731219205010	PRABHU.M	75
8	731219205011	PRIYADHARSINI.T	96
9	731219205018	VAIDEVI.M	88
10	731219205019	VAIGAIRAJ.M	85
		III YEAR	
11	731220205001	AJAYSRI. A	77
12	731220205004	DEEPAK.A	85
13	731220205007	DHINESHKUMAR .M	64
14	731220205008	DINESH.S	60
15	731220205009	GOKUL.S	91
16	731220205011	KALAISELVI.K	97
17	731220205012	KAVIN.P	55
18	731220205014	MAYILRAJ.V	40
19	731220205015	MUTHUKUMAR.G	75
20	731220205016	PANDIYARAJ.C	98
21	731220205017	PARVATHY.A	67
22	731220205018	PRIYANKA.S	73
23	731220205019	RAMKUMAR.R	57

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24	731220205020	RAVI SANKARAN.N	85
25	731220205021	SHIJIN KUMAR.K.G	78
26	731220205024	THANGESHWARI.G	94
27	731220205301	POORANESHWARAN.N	89
28	731220205302	RAVINDHIRAN.R	70
29	731220205303	SHILPA.C	84
II YEAR			
30	731221205003	BHUVANESWARAN M	47
31	731221205004	BOOPATHI C	86
32	731221205005	DEVIKA A	69
33	731221205006	DHANALAKSHMI C	63
34	731221205007	DHARSHINI P	76
35	731221205008	DHAYALAN R	43
36	731221205009	DINESH M	82
37	731221205010	DIVYA S	57
38	731221205012	KAVIBHARATHI G	91
39	731221205013	KOWSALYA G	70
40	731221205015	KRISHNAN S	93
41	731221205016	MADHANKUMAR N	82
42	731221205017	MAHADEVAMMA S	77
43	731221205020	MANILA K	54
44	731221205021	MANOJKUMAR S	60
45	731221205022	MAVURIYA D	40
46	731221205023	MEGALATHANGAMANI M	66
47	731221205026	MOTHIR L	78
48	731221205028	NANDHINI S	82
49	731221205029	NAVEEN S	92
50	731221205030	PANDEESWARAN C K	81
51	731221205031	PARTHIBAN M	48
52	731221205032	RAKSHITHA B	80
53	731221205033	RATHNA R	85
54	731221205034	RAVIKUMAR M	76

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55	731221205035	RITHIK S	95
56	731221205036	ROHITH V	71
57	731221205037	SHARANKUMAR M V	89
58	731221205039	SUNDHARESWARI V	84
59	731221205040	SUYAMBURAJ C	86
60	731221205041	SWETHA S	93
61	731221205042	TAMILSELVAN M	80
62	731221205044	YUSWANTHRAA R	97
63	731221205301	AHALYA J C	75

Note: The students those who have secured above 50 Marks and above are consider eligible for program completion.

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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2022-2023

SUMMARY/ OUTCOME REPORT

Name of the Certificate Program: Advanced Digital Marketing Strategies for Engineering Innovations: A Comprehensive Approach

Program Code : 22IIADMSFEI01

Name of the Program Coordinator: Mrs.P.SANGEETHA

Number of Students Enrolled : 63 **Duration:** 36 Hours

Number of Students Completed : 58

I hereby affirm that the entire Program contents in the Certificate Program **"Advanced Digital Marketing Strategies for Engineering Innovations: A Comprehensive Approach"** listed in the Syllabus have been actually learned by the students as the part of the prescribed co-curricular activities through Certificate Program.

I confirmed that the Certificate Program title as **Advanced Digital Marketing Strategies for Engineering Innovations: A Comprehensive Approach** Work Bench was done by me in the beginning of this semester and Program delivery with attendance of the students was recorded.

I confirmed that all registered students for this Certificate Program were actively attended and learned well throughout the duration of this Program. And all students were successfully completed and eligible to receive the participation certificate.

OUTCOME: Students shall be able to gain the knowledge in

(i) Develop targeted digital marketing strategies for engineering innovations.

(ii) Create compelling technical content optimized for engineering audiences.

(iii) Utilize analytics tools to measure and optimize campaign performance.

(iv) Present comprehensive digital marketing plans for engineering products/services.

Name : P. SANGEETHA

Designation: ASSISTANT PROFESSOR - IT

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This is to certify that Mr./Ms. GOWTHAM.H

of IT-IV YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

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SEO

PPC

Digital Marketing I

SMM

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This is to certify that Mr./Ms. DHINESHKUMAR .M

of IT-III YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

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of IT-III YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

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This is to certify that Mr./Ms. GOKUL.S

of IT-III YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

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This is to certify that Mr./Ms. KALAISELVI.K

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Of Appreciation

This is to certify that Mr./Ms. MAYILRAJ.V

of IT-III YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR **HOD**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638506.
GOBI (Tk), ERODE (Dt).

PRINCIPAL

Certificate

Of Appreciation

This is to certify that Mr./Ms. MUTHUKUMAR.G

of IT-III YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638506
GOBI (Tk), ERODE DIST.

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. PANDIYARAT.C

of IT-III YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. PARVATHY.A

of IT-III YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638506
GOBI (Tk), ERODE (Dt).

COORDINATOR HOD PRINCIPAL

Certificate

Of Appreciation

This is to certify that Mr./Ms. POORANESHWARAN.N of IT-III YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR

HOD

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (Tk), ERODE (Dt).

PRINCIPAL

Certificate

Of Appreciation

This is to certify that Mr./Ms. PRIYANKA S

of IT-III YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

Digital Marketing I

SMM

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Certificate

Of Appreciation

This is to certify that Mr./Ms. RAMKUMAR.R

of IT-III YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. RAVI SANKARAN.N of IT-III YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638506
GOBI (Tk), ERODE DT.

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. POORANESHWARAN.N of IT-III YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. SHIJIN KUMAR.K.G

of IT-III YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt)

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. SHILPA.C

of IT-III YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638506
GOBI (Tk), ERODE (Dt)

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. THANGESHWARI.G of IT-III YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638506.
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate
Of Appreciation

This is to certify that Mr./Ms. AHALYA J C

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. BHUVANESWARAN M

of IT-II YEAR successfully completed the certificate program

titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506,
GOBI (Tk), ERODE (Dt).

Certificate

Of Appreciation

This is to certify that Mr./Ms. BOOPATHI C of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. DEVIKA A

of IT-II YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506,
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. DHANALAKSHMI.C

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

PRINCIPAL
IKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. DHARSHINI P

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. DHAYALAN R

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. DINESH M

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

COORDINATOR

HOD

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638
GOBI (Tk), ERODE (Dt).

PRINCIPAL

Certificate

Of Appreciation

This is to certify that Mr./Ms. DIVYA S

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO PPC Digital Marketing I SMM

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (Tk), ERODE (Dt)

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. KAVIBHARATHI G

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach "** organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (Tk), ERODE (Dt).

Certificate

Of Appreciation

This is to certify that Mr./Ms. KOWSALYA G of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt)

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. KRISHNAN S

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. MADHANKUMAR N of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

COORDINATOR

HOD

PRINCIPAL
JKK MUNIRAJAH COLLEGE OF TECHNOLOGY
T.N. PALAYAM (Po)-638506
GOBI (Tk), ERODE (Dt).

PRINCIPAL

Certificate

Of Appreciation

This is to certify that Mr./Ms. MAHADEVAMMA S

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. MANILA K

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (Tk), ERODE (Dt)

COORDINATOR **HOD** **PRINCIPAL**

Certificate

Of Appreciation

This is to certify that Mr./Ms. MANOJKUMAR S

of IT-II YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate
Of Appreciation

This is to certify that Mr./Ms. MAVURIYA D

of IT-II YEAR successfully completed the certificate program titled "**Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. MEGALATHANGAMANI M

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. MOTHIR I

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO
PPC
Digital Marketing I
SMM

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506
GOBI (TK), ERODE (Dt).

COORDINATOR **HOD** **PRINCIPAL**

Certificate
Of Appreciation

This is to certify that Mr./Ms. NANDHINI S

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

COORDINATOR

HOD

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

PRINCIPAL

Certificate
Of Appreciation

This is to certify that Mr./Ms. NAVEEN S

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 PRINCIPAL
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. PANDEESWARAN C K

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO
PPC
Digital Marketing I
SMM

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

SEO

This is to certify that Mr./Ms. PARTHIBAN M

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

PPC

Digital Marketing I

Duration: 12.09.2022 to 17.09.2022

SMM

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. RAKSHITHA B of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO

PPC

Digital Marketing I

SMM

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. RATHNA R

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. RAVIKUMAR M of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

SEO
PPC
Digital Marketing I
SMM

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638506
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. RITHIK S of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. ROHITH V

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR **HOD**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638506.
GOBI (Tk), ERODE (Dt).

PRINCIPAL

Certificate
Of Appreciation

This is to certify that Mr./Ms. SHARANKUMAR M V

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638506
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. SUNDHARESWARI V

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR

HOD

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

PRINCIPAL

Certificate
Of Appreciation

This is to certify that Mr./Ms. SUYAMBURAJ C

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Certificate
Of Appreciation

This is to certify that Mr./Ms. SWETHA S

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE

COORDINATOR **HOD** **PRINCIPAL**

Certificate
Of Appreciation

This is to certify that Mr./Ms. TAMILSELVAN M of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR

HOD

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 116.
GOBI (Tk). ERODE

PRINCIPAL

Certificate
Of Appreciation

This is to certify that Mr./Ms. YUSWANTHRAA R

of IT-II YEAR successfully completed the certificate program titled **"Advanced Digital Marketing Strategies for Engineering innovations: A Comprehensive Approach** "organized by Department of Information Technology.

Duration: 12.09.2022 to 17.09.2022

COORDINATOR **HOD** **PRINCIPAL**

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-
GOBI (Tk), ERO

IT

ACADEMIC YEAR (2022-2023)

J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY
T.N.Palayam(po),Gobi(tk)-638506, Erode(dt).

Metric No 1.3.2

S.No	Name of the course	course code	programme offering	Experiential learning			Number of students
				project work	field work	inplant training	
(2022-2023) Regulation-2017							
1	Project Work	IT8811	INFORMATION TECHNOLOGY	✓			10
2	Software Engineering	CS8494	INFORMATION TECHNOLOGY	✓			8
3	Computer Networks	CS8591	INFORMATION TECHNOLOGY	✓			6
4	Object Oriented Analysis and Design	CS8592	INFORMATION TECHNOLOGY	✓			6
5	Artificial Intelligence	CS8691	INFORMATION TECHNOLOGY	✓			8
6	Mobile Computing	CS8601	INFORMATION TECHNOLOGY	✓			8
7	Cryptography and Network Security	CS8792	INFORMATION TECHNOLOGY	✓			10
8	Cloud Computing	CS8791	INFORMATION TECHNOLOGY	✓			4

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JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (PO)-638 506.
GOBI (TK), ERODE (DT).

J.K.K. MUNIRAJAHCOLLEGE OF TECHNOLOGY

Approved by AICTE, New Delhi And Affiliated to Anna University, Chennai.

Accredited by NAAC with "A" grade

T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

INFORMATION TECHNOLOGY

2022-2023

S.NO	REG.NO	STUDENT NAME	PROJECT	INTERNSHIP	FIELD VISIT
1	731219205002	GOWTHAM.H	✓	✓	
2	731219205004	MAHANTESH.S	✓	✓	
3	731219205005	NANDHINI.R	✓		
4	731219205007	NAVEEN.S	✓		
5	731219205008	NINGARAJU.S	✓	✓	
6	731219205009	NITHYA.K	✓		
7	731219205010	PRABHU.M	✓		
8	731219205011	PRIYADHARSINI.T	✓		
9	731219205018	VAIDEVI.M	✓		
10	731219205019	VAIGAIRAJ.M	✓	✓	
11	731220205001	AJAYSRI. A		✓	
12	731220205002	AJITHKUMAR.K		✓	
13	731220205004	DEEPAK.A		✓	
14	731220205005	DEVAKI. V		✓	
15	731220205006	DHARANI.M		✓	
16	731220205007	DHINESHKUMAR .M		✓	
17	731220205008	DINESH.S		✓	
18	731220205009	GOKUL.S		✓	

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19	731220205011	KALAISELVI.K		✓	
20	731220205012	KAVIN.P		✓	
21	731220205013	LENA TAMILVANAN.G		✓	
22	731220205014	MAYILRAJ.V		✓	
23	731220205015	MUTHUKUMAR.G		✓	
24	731220205016	PANDIYARAJ.C		✓	
25	731220205017	PARVATHY.A		✓	
26	731220205018	PRIYANKA.S		✓	
27	731220205019	RAMKUMAR.R		✓	
28	731220205020	RAVI SANKARAN.N		✓	
29	731220205021	SHIJIN KUMAR.K.G		✓	
30	731220205022	SIVABALAJI.N		✓	
31	731220205023	SRIRAM.V		✓	
32	731220205024	THANGESHWARI.G		✓	
33	731220205301	POORANESHWARAN.N		✓	
34	731220205302	RAVINDHIRAN.R		✓	
35	731220205303	SHILPA.C		✓	
36	731221205003	BHUVANESWARAN M		✓	
37	731221205004	BOOPATHI C		✓	
38	731221205005	DEVIKA A		✓	
39	731221205006	DHANALAKSHMI C		✓	

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40	731221205007	DHARSHINI P		✓	
41	731221205008	DHAYALAN R		✓	
42	731221205009	DINESH M		✓	
43	731221205010	DIVYA S		✓	
44	731221205011	KARTHICKRAJA G		✓	
45	731221205012	KAVIBHARATHI G		✓	
46	731221205013	KOWSALYA G		✓	
47	731221205015	KRISHNAN S		✓	
48	731221205016	MADHANKUMAR N		✓	
49	731221205017	MAHADEVAMMA S		✓	
50	731221205019	MANIGANDAN M		✓	
51	731221205020	MANILA K		✓	
52	731221205021	MANOJKUMAR S		✓	
53	731221205022	MAVURIYA D		✓	
54	731221205023	MEGALATHANGAMANI M		✓	
55	731221205026	MOTHIR L		✓	
56	731221205027	MOUNASAKTHI G		✓	
57	731221205028	NANDHINI S		✓	
58	731221205029	NAVEEN S		✓	
59	731221205030	PANDEESWARAN C K		✓	
60	731221205031	PARTHIBAN M		✓	

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61	731221205032	RAKSHITHA B		✓	
62	731221205033	RATHNA R		✓	
63	731221205034	RAVIKUMAR M		✓	
64	731221205035	RITHIK S		✓	
65	731221205036	ROHITH V		✓	
66	731221205037	SHARANKUMAR M V		✓	
67	731221205038	SIDDAPPA S		✓	
68	731221205039	SUNDHARESWARI V		✓	
69	731221205040	SUYAMBURAJ C		✓	
70	731221205041	SWETHA S		✓	
71	731221205042	TAMILSELVAN M		✓	
72	731221205044	YUSWANTHRAA R		✓	
73	731221205301	AHALYA J C		✓	

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INFORMATION TECHNOLOGY

S.No	Name of the Course that include experiential learning through Project Work/Internship/Field Visit
1	Software Engineering
2	Computer Networks
3	Object Oriented Analysis and Design
4	Artificial Intelligence
5	Mobile Computing
6	Cryptography and Network Security
7	Cloud Computing

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PROJECT

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DEPARTMENT OF INFORMATION TECHNOLOGY

PROJECT BATCH LIST (2022-2023)

S.NO	REGISTER NO	NAME LIST	GUIDE NAME	PROJECT TITLE
1	731219205002	GOWTHAM.H	MR.E.VIJAY ANANTH	PREVENTIG CYBERBULLING IN SOCIAL NETWORKING SITES USING DEEP LEARNING MODEL
2	731219205008	NINGARAJU.S		
3	731219205004	MAHANTESH.S	DR.N.SATHYABALAJI	BIGDATA AND MACHINE LEARNING WITH HYPERSPECTRAL INFORMATION IN AGRICULTURE
4	731219205019	VAIGAIRAJ.M		
5	731219205007	NAVEEN.S	MR.E.VIJAY ANANTH	INTRUSION DETECTION OF IMBALANCED NETWORK TRAFFIC BASED ON MACHINE LEARNING & DEEP LEARNING
6	731219205010	PRABHU.M		
7	731219205011	PRIYADHARSINI.T	MRS.P.SANGEETHA	SOIL ANALYSIS AND CROP RECOMMENDATION USING MACHINE LEARNING
8	731219205018	VAIDEVI.M		
9	731219205005	NANDHINI.R	MRS.D.NIVETHINI	DESIGN AND DEVELOPMENT OF HUMAN IDENTIFICATIO AND OBSTACLE DETECTION SYSTEM FOR BLIND USING DEEP LEARNING
10	731219205009	NITHYA.K		

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CS8592 **OBJECT ORIENTED ANALYSIS AND DESIGN** LTPC

3003

OBJECTIVES:

- To understand the fundamentals of object modeling
- To understand and differentiate Unified Process from other approaches.
- To design with static UML diagrams.
- To design with the UML dynamic and implementation diagrams.
- To improve the software design with design patterns.
- To test the software against its requirements specification

UNITI UNIFIEDPROCESSAND USE CASEDIAGRAMS 9

IntroductiontoOOADwithOOBasics-UnifiedProcess–UMLdiagrams–UseCase–Casestudy –theNextGenPOSsystem,Inception-UsecaseModelling–RelatingUsecases– include,extendandgeneralization–WhentouseUse-cases

UNITII STATIC UML DIAGRAMS 9

Class Diagram— Elaboration – Domain Model – Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual classHierarchies–AggregationandComposition-Relationshipbetweensequencediagramsandusecases—WhentouseClassDiagrams

UNITIII DYNAMICAND IMPLEMENTATIONUML DIAGRAMS 9

Dynamic Diagrams – UML interaction diagrams - System sequence diagram – Collaboration diagram – When to use Communication Diagrams - State machine diagram and Modelling– WhentouseStateDiagrams-Activitydiagram–Whentouseactivitydiagrams

Implementation Diagrams - UML package diagram- When to use package diagrams - ComponentandDeploymentDiagrams–WhentouseComponentandDeploymentdiagrams

UNITIV DESIGN PATTERNS 9

GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling –High Cohesion—Controller **Design Patterns – creational** – factory method – **structural** – Bridge – Adapter – **behavioural** –Strategy–observer–Applying GoF design patterns–Mapping design to code

UNITV TESTING 9

Object Oriented Methodologies – Software Quality Assurance – Impact of object orientation

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on Testing–Develop Test Cases and Test Plans

TOTAL:45PERIODS

OUTCOMES:

At the end of the course, the students will be able to:

- Expresss of tware design with UML diagrams
- Design software applications using OO concepts.
- Identify various scenarios based on software requirements
- TransformUMLbasedsoftwaredesignintopatternbaseddesignusingdesignpatterns
- Understand the various testing methodologies for OO software

TEXTBOOKS:

1. CraigLarman,—ApplyingUMLandPatterns:AnIntroductiontoObject-OrientedAnalysisandDesignandIterativeDevelopment‖,ThirdEdition,PearsonEducation,2005.
2. AliBahrami-Object Oriented Systems Development -McGrawHillInternationalEdition-1999

REFERENCES:

1. ErichGamma,andRichardHelm,RalphJohnson,JohnVlissides,—Designpatterns:ElementsofReusableObject-OrientedSoftware‖,Addison-Wesley,1995.
2. MartinFowler,—UMLDistilled:ABriefGuidetotheStandardObjectModelingLanguage‖,Thirdedition,Addison Wesley,2003.

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PREVENTING CYBERBULLYING IN SOCIAL NETWORKING SITES USING DEEP LEARNING MODEL

A PROJECT REPORT

Submitted by

H.GOWTHAM **(731219205002)**

S.NINGARAJU **(731219205008)**

In partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N.PALAYAM,GOBI-638506

ANNA UNIVERSITY:: CHENNAI 600 025

MAY 2023

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ANNA UNIVERSITY:: CHENNAI 600 025

BONAFIDECERTIFICATE

Certified that this project report on " **PREVENTING CYBERBULLYING IN SOCIAL NETWORKING SITES USING DEEP LEARNING MODEL**" is the bonafide work of **"H.GOWTHAM(731219205002) , S.NINGARAJU(731219205008)"** who carried out the project work under my supervision

SIGNATURE

Dr.N.SATHYABALAJI,M.E,Ph.D.,M.I.S.T.E

ASSOCIATE PROFESSOR

HEAD OF THE DEPARTMENT

Dept.of Information Technology
J.K.K.Munirajah College of Technology
T.N.Palayam

SIGNATURE

Mr.E.VIJAY ANANTH.,M.E.,

ASSISTANT PROFESSOR

SUPERVISOR

Dept.of Information Technology
J.K.K.Munirajah College of Technology
T.N.palayam

Submitted for the Viva-Voce examination held on 18/05/2023 & AN

INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

Cyberbullying is bullying that takes place over digital devices like cell phones, computers, and tablets. Cyberbullying can occur through SMS, Text, and apps, or online in social media, forums, or gaming where people can view, participate in, or share content. Cyberbullying includes sending, posting, or sharing negative, harmful, false, or mean content about someone else. It can include sharing personal or private information about someone else causing embarrassment or humiliation. The content an individual share online – both their personal content as well as any negative, mean, or hurtful content – creates a kind of permanent public record of their views, activities, and behaviour. To avoidor detecting cyberbullying attacks, many existing approaches in the literature incorporate Machine Learning and Natural Language Processing text classification models without considering the sentence semantics. The main goal of this project is to overcome that issue.

This project proposed a model LSTM - CNN architecture for detecting cyberbullying attacks and it used word2vec to train the custom of word embeddings.This model is used to classify tweets or comments as bullying or non-bullying based on the toxicity score.LSTM networks are well-suited to classifying, processing and making predictions based on time series data, since there can be lags of unknown duration between important events in a time series. A convolutional neural network (CNN) is a type of artificial neural network and it has a convolutional layer to extract information by a larger piece of text and by using this model LSTM- CNN achieve a higher accuracy in analysis, classification and detecting the cyberbullying attacks on posts and comments.

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

Cyberbullying is bullying that takes place over digital devices like cell phones, computers, and tablets. Cyberbullying can occur through SMS, Text, and apps, or online in social media, forums, or gaming where people can view, participate in, or share content. Cyberbullying includes sending, posting, or sharing negative, harmful, false, or mean content about someone else. It can include sharing personal or private information about someone else causing embarrassment or humiliation. Some cyberbullying crosses the line into unlawful or criminal behaviour.

The most common places where cyberbullying occurs are:

- Social Media, such as Facebook, Instagram, Snapchat, and Tik Tok
- Text messaging and messaging apps on mobile or tablet devices
- Instant messaging, direct messaging, and online chatting over the internet
- Online forums, chat rooms, and message boards, such as Reddit
- Email
- Online gaming communities

DIFFERENT KINDS OF CYBERBULLYING

There are many ways that someone can fall victim to or experience cyberbullying when using technology and the internet. Some common methods of cyberbullying are:

Harassment – When someone is being harassed online, they are being subjected to a string of abusive messages or efforts to contact them by one

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CHAPTER 10

CONCLUSION

Cyberbullying is the harassment that takes place in digital devices such as mobile phones, computers and tablets. The means used to harass victims are very diverse: text messages, applications, social media, forums or interactive games.One of the things that complicates these types of situations that occur through the Internet, is the anonymity this environment allows. Since this facilitates cyberbullying can cover almost all areas of the victim's life, that is: educational environment, work, social or loving life. When the identity of the harasser is not known, even if the facts are reported, in many cases it is not enough to open an investigation, identify it and pay for the crime committed..

This project proposed a deep learning model Bidirectional Long Short Term Memory (BiLSTM. Thus, this projecthasdesigned a method of automatically detecting the Cyberbullying attack cases. Identifies the messages or comments or posts which the BiLSTM model predicts as offensive or negative then it blocks that person id,then the admin can create automated reports and send to the concern department.Experiments are conducted to test three machine learning and 2 deep learning models that are; (1) GBM, (2) LR, (3) NB, (4) LSTM-CNN and (5) BiLSTM. This project also employed two feature representation techniques Tfand TF-IDF. The results showed that all models performed well on tweet dataset but our proposed BiLSTM classifier outperforms by using both TF and TF-IDF among all. Proposed model achieves the highest results using TF-IDF with 96% Accuracy, 92% Recall and 95% F1-score.

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INTERNSHIP DETAILS 2022-23

SI.NO	REGISTER NUMBER	STUDENT NAME	NAME OF THE COMPANY	LOCATION	DATE
1	731219205002	GOWTHAM.H	VCITEX SOLUTIONS PVT LTD	CHENNAI	20.03.2023 to 25.03.2023
2	731219205008	NINGARAJU.S			

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Gmail

Internship
1message

MON 13 Mar 2023 at 2.00pm

From: HODCSE<hodcse@jkkmct.edu.in>

Date: MON 13 Mar 2023 at 2.00pm

Subject: Internship-reg

To: VCITEX SOLUTIONS PVT LTD <hr.vcitexinfotech@gmail.com>

Dear Sir,

I am requesting to be joining your **VCITEX SOLUTIONS PVT LTD**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following students: **GOWTHAM.H, NINGARAJU.S**

Sincerely,

Final Year CSE Student,
J K K Munirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.

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GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

THUR 16 Mar 2023 at 3.30pm

From: VCITEX SOLUTIONS PVT LTD <hr.vcitexinfotech@gmail.com>
Date: THUR 16 Mar 2023 at 3.30pm
Subject: Internship-reg
To: HODCSE<hodcse@jkkmct.edu.in>

Dear SIR,

I am writing to confirm my acceptance of your internship offer of 20.03.2023 to 25.03.2023 and to tell you how to be joining my **VCITEX SOLUTIONS PVT LTD**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

As we discussed, I will report at 8:00 a.m. on March18, 2023 and will be ready to take on my first assignment as an intern from my company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following students: **GOWTHAM.H, NINGARAJU.S**

Sincerely,

HR Manager,
VCITEX SOLUTIONS PVT LTD,
Chennai.

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VCIDEX

Bring IT to Mass

This is to certify that Mr/Ms. GOWTHAM.H Final year B.E.,Computer Science and Engineering of JKK MUNIRAJAH COLLEGE OF TECHNOLOGY, Erode, has attended Internship training in our organization from 20.03.2023 to 25.03.2023. During this Internship training, he/she has learned the overview concepts of

PREVENTIG CYBERBULLING IN SOCIAL NETWORKING SITES

USING DEEP LEARNING MODEL

DATE:25.03.2023

AUTHORIZED SIGNATURE

PRINCIPAL

JKK MUNIRAJAH C
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T.U. PALAYAM (PO)-
(TK), ERODE (Dt).

VCIDEX

Bring IT to Mass

This is to certify that Mr/Ms. NINGARAJU.S Final year B.Tech. Information Technology of JKK MUNIRAJAH COLLEGE OF TECHNOLOGY, Erode, has attended Internship training in our organization from 20.03.2023 to 25.03.2023. During this Internship training, he/she has learned the overview concepts of

PREVENTIG CYBERBULLING IN SOCIAL NETWORKING SITES

USING DEEP LEARNING MODEL

DATE:25.03.2023

AUTHORIZED SIGNATURE

PRINCIPAL
JKK MUNIRAJAH C
OF TECHNO
T.N. PALAYA
GOBI (Tk), ERODE (Dt).

CS8494	SOFTWARE ENGINEERING	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the phases in a software project
- Tounderstandfundamentalconceptsofrequirementsengineeringand AnalysisModeling.
- To understand the various software design methodologies
- To learn various testing and maintenance measures

UNITI SOFTWAREPROCESSANDAGILEDEVELOPMENT **9**

Introduction to Software Engineering, Software Process, Perspective and Specialized Process Models–Introduction to Agility-Agile process-Extreme programming-XP Process.

UNITII REQUIREMENTSANALYSISAND SPECIFICATION **9**

Software Requirements: Functional and Non-Functional, User requirements, System requirements, SoftwareRequirementsDocumentRequirementEngineeringProcess:FeasibilityStudies,Requirements elicitationandanalysis,requirementsvalidation,requirementsmanagement-Classical analysis:Structured system Analysis, Petri Nets-Data Dictionary.

UNITIII SOFTWARE DESIGN **9**

Design process — Design Concepts-Design Model– Design Heuristic — Architectural Design -Architectural styles, Architectural Design, Architectural Mapping using Data Flow- User Interface Design: Interface analysis, Interface Design –Component level Design: Designing Class based components, traditional Components.

UNITIV TESTINGANDMAINTENANCE **9**

Software testing fundamentals-Internal and external views of Testing-white box testing - basis path testing-control structure testing-black box testing- Regression Testing — Unit Testing — Integration Testing— Validation Testing— System Testing And Debugging–Software Implementation Techniques: Coding practices-Refactoring-Maintenance and Reengineering-BPRmodel-Reengineeringprocessmodel-ReverseandForwardEngineering.

UNITV PROJECTMANAGEMENT **9**

Software Project Management: Estimation – LOC, FP Based Estimation, Make/Buy Decision COCOMO I & II Model – Project Scheduling – Scheduling, Earned Value Analysis Planning –Project Plan, Planning Process, RFP Risk Management – Identification, Projection - Risk Management-Risk Identification-RMMM Plan-CASETOOLS

TOTAL:45PERIODS

OUTCOMES:

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On Completion of the course, the students should be able to:

- Identify the key activities in managing a software project.
- Compare different process models.
- Concepts of requirements engineering and Analysis Modeling.
- Apply systematic procedure for software design and deployment.
- Compare and contrast the various testing and maintenance.
- Manage project schedule, estimate project cost and effort required.

TEXTBOOKS:

1. RogerS.Pressman, —Software Engineering– APractitioner"s Approach‖,SeventhEdition,McGraw-HillInternationalEdition,2010.
2. IanSommerville,—SoftwareEngineering‖,9thEdition,PearsonEducationAsia,2011.

REFERENCES:

1. RajibMall,—FundamentalsofSoftwareEngineering‖,ThirdEdition,PHILearningPrivate Limited,2009.
2. PankajJalote,—SoftwareEngineering,APreciseApproach‖,WileyIndia,2010.
3. KelkarS.A.,—SoftwareEngineering‖,PrenticeHallofIndiaPvtLtd,2007.
4. StephenR.Schach,—SoftwareEngineering‖,TataMcGraw-HillPublishingCompanyLimited,2007.
5. http://nptel.ac.in/.

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BIG DATA AND MACHINE LEARNING WITH HYPERSPECTRAL INFORMATION IN AGRICULTURE

A PROJECT REPORT

Submitted by

S.MAHANTESH **(731219205004)**

M.VAIGAIRAJ **(731219205019)**

in partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N.PALAYAM, GOBI-638 506

ANNA UNIVERSITY:: CHENNAI 600 025

MAY 2023

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GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY::CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report on **"BIG DATA AND MACHINE LEARNING WITH HYPERSPECTRAL INFORMATION IN AGRICULTURE"** is the bonafide work of **"S.MAHANTESH (731219205004), and M.VAIGAIRAJ (731219205019)"** who carried out the project work Under my supervision.

SIGNATURE
Dr.N.SATHYABALAJI.M.E.Ph.D,M.I.S.T.E,
ASSOCIATE PROFESSOR
HEAD OF THE DEPARTMENT
Dept.of Information Technology
J.K.K.Munirajah College of Technology
T.N.Palayam

SIGNATURE
Dr.N.SATHYABALAJI.M.E.Ph.D,M.I.S.T.E,
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SUPERVISOR
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Submitted for the Viva-Voce examination held on 18.05.2023 FAN

INTERNAL EXAMINER

18/5/23
EXTERNAL EXAMINER

PRINCIPAL
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ABSTRACT

Hyperspectral and multispectral information processing systems and technologies have demonstrated its usefulness for the improvement of agricultural productivity and practices by providing useful information to farmers and crop managers on the factors affecting crop status and growth. These technologies are widely used in a range of agriculture applications such as crop management, crop yield forecasting, crop disease detection, and the monitoring of agriculture land usage, water, and soil conditions. Hyperspectral information sensing can acquire several hundred spectral bands that cover the electromagnetic spectrum of an observational scene in a single acquisition.

The resulting hyperspectral data cube contains a large volume of spatial and spectral information. The hyperspectral sequence of images or video further increases the data generation velocity and volume which lead to the Big data challenges particularly in agricultural remote sensing applications. This project is structured to first give a comprehensive review of representative studies to provide insights into significant research efforts in agriculture using Big data, machine learning and deep learning with the focus on frameworks or architectures, information processing and analytics with hyperspectral and multispectral data.

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CHAPTER 1

INTRODUCTION

This makes it important for farmers and crop growers to utilize emerging technologies to improve productivity to feed the growing global population. The technology and data driven economy and its focus on developing intelligent instrumentation, sensing, robotics, artificial intelligence (AI), machine learning, Big data and data analytics is expected to play a transformative role in agriculture to raise the rate of food production. Big data is increasingly being developed and deployed for many industries, professions, and trade sectors. For the agriculture sector, Big data provides farmers with useful and actionable information on weather and seasonal patterns, rain and water cycles, fertilizer requirements, and other critical information for harvesting and decision making. This enables farmers, agricultural suppliers and other stakeholders to make smart decisions such as the cycles for crops planting to increase profitability and the planning of optimal harvesting times leading to improved farm yields. To address the issues of the deployment of Big data in agriculture and Big data which are produced from large-scale networked sensing systems.

1.1 IMAGE PROCESSING

Image processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. It is a type of signal dispensation in which input is image, like video frame or photograph and output may be image or characteristics associated with that image. Usually Image Processing system includes treating images as two dimensional signals while applying already set signal processing methods to them. It is among rapidly growing technologies today, with its applications in various aspects of a business. Image Processing forms core research area within engineering and

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CHAPTER 9

CONCLUSION AND FUTURE ENHANCEMENT

9.1 CONCLUSION

Fine-tuned with the new training set constructed by incorporating the newly labeled pixels. This step together with the previous step is iteratively conducted.Image Compression &restoration is an important aspect in multimedia communication. We have presented a hybrid technique using DWT for Compression &restoration of image files. An important aspect is data Compression & restoration and for that matter Image Compression & restoration , as images form a larger part of data being exchanged over the internet through social networking and messaging sites and apps all over the world. Among all the various kinds of data images and videos constitute the bulkiest data.

Thus, need for compressing the image and video files is an important aspect in data communication. In this research work we present a technique for image Compression &restoration , using Discrete Cosine Transform and Fuzzy Logic Techniques. The algorithm used in this paper is tested along with several images and the results are compared with other techniques. Our method shows an improved performance both in Compression &restoration ratio as well as image perceptibility.

9.2 FUTURE ENHANCEMENT

The need for efficient machine learning algorithms and classifiers, and also to overcome the shortage of high-quality and labeled training images The need for efficient and scalable computational architectures for rapid information processing The need for standardization and ease of use for remote sensing format sand sensor resolutions particularly for non-expert user.

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J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

Approved by AICTE, New Delhi And Affiliated to Anna University, Chennai.

Accredited by NAAC with "A" grade

T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

INTERNSHIP DETAILS 2022-23

SI.NO	REGISTER NUMBER	STUDENT NAME	NAME OF THE COMPANY	LOCATION	DATE
1	731219205004	MAHANTESH.S	PANTECH SOLUTIONS	COIMBATORE	06.03.2023 to 11.03.2023
2	731219205019	VAIGAIRAJ.M			

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Gmail

Internship
1message

MON 27 Feb 2023 at 2.00pm

From: HODCSE<hodcse@jkkmct.edu.in>

Date: MON 27 Feb 2023 at 2.00pm

Subject: Internship-reg

To: PANTECH SOLUTIONS<hr. hr.pantechsol@gmail.com>

Dear Sir,

I am requesting to be joining your **PANTECH SOLUTIONS**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following students: **MAHANTESH.S, VAIGAIRAJ.M**

Sincerely,

Final Year CSE Student,
J K K Munirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.

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Gmail

Internship
1message

THUR 2 Mar 2023 at 3.30pm

From: PANTECH SOLUTIONS <hr.pantechsol@gmail.com>
Date: THUR 2 Mar 2023 at 3.30pm
Subject: Internship-reg
To: HODCSE<hodcse@jkkmct.edu.in>

Dear SIR,

I am writing to confirm my acceptance of your internship offer of 06.03.2023 to 11.03.2023 and to tell you how to be joining my **PANTECH SOLUTIONS**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

As we discussed, I will report at 8:00 a.m. on March 04, 2023 and will be ready to take on my first assignment as an intern from my company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following students: **MAHANTESH.S, VAIGAIRAJ.M**

Sincerely,

HR Manager,
PANTECH SOLUTIONS,
Coimbatore.

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Technology Beyond the Dreams

This is to certify that Mr/Ms.MAHATESH.S Final year B.Tech., Information Technology of JKK MUNIRAJAH COLLEGE OF TECHNOLOGY, Erode, has attended Internship training in our organization from 06.03.2023 to 11.03.2023. During this Internship training, he/she has learned the overview concenpts of BIGDATA AND MACHINE LEARNING WITH HYPERSPECTRAL INFORMATION IN AGRICULTURE

DATE:11.03.2023

Authorized signature

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DATE:11.03.2023

Authorized signature

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CS8591	COMPUTERNETWORKS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the protocol layering and physical level communication.
- To analyze the performance of a network.
- To understand the various components required to build different networks.
- To learn the functions of network layer and the various routing protocols.
- To familiarize the functions and protocols of the Transport layer.

UNIT I INTRODUCTION AND PHYSICAL LAYER 9

Networks – Network Types – Protocol Layering – TCP/IP Protocol suite – OSI Model –Physical Layer: Performance – Transmission media – Switching – Circuit-switched Networks—Packet Switching.

UNIT II DATA-LINK LAYER & MEDIA ACCESS 9

Introduction–Link-Layer Addressing –DLC Services–Data-Link Layer Protocols –HDLC –PPP-MediaAccessControl-WiredLANs:Ethernet-WirelessLANs–Introduction–IEEE802.11,Bluetooth–ConnectingDevices.

UNIT III NETWORK LAYER 9

NetworkLayerServices–Packetswitching–Performance–IPV4Addresses–Forwardingof IP Packets - Network Layer Protocols: IP, ICMP v4 – Unicast Routing Algorithms – Protocols–MulticastingBasics–IPV6Addressing–IPV6Protocol.

UNITIV TRANSPORTLAYER 9

Introduction–TransportLayerProtocols–Services–PortNumbers–UserDatagramProtocol–TransmissionControlProtocol–SCTP.

UNITV APPLICATIONLAYER 9

WWW and HTTP–FTP–Email–Telnet–SSH–DNS–SNMP.

TOTAL: 45 PERIODS

OUTCOMES:

On Completion of the course, the students should be able to:

- Understand the basic layers and its functions in computer networks.
- Evaluate the performance of a network.
- Understand the basics of how data flows from one node to another.
- Analyze and design routing algorithms.
- Design protocols for various functions in the network.
- Understand the working of various application layer protocols

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TEXTBOOK:

1. Behrouz A. Forouzan, Data Communications and Networking, Fifth Edition TMH,2013.

REFERENCES

1. Larry L. Peterson, Bruce S. Davie, Computer Networks: A Systems Approach, Fifth Edition, Morgan Kaufmann Publishers Inc.,2012.
2. William Stallings, Data and Computer Communications, Tenth Edition, PearsonEducation,2013.
3. NaderF.Mir,ComputerandCommunicationNetworks,SecondEdition,Prentice Hall,2014.
4. Ying-Dar Lin, Ren-Hung Hwang and Fred Baker, Computer Networks: An OpenSourceApproach,McGrawHillPublisher,2011.
5. James F. Kurose, Keith W. Ross, Computer Networking, A Top-Down ApproachFeaturingthe Internet, SixthEdition,PearsonEducation,2013.

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INTRUSION DETECTION OF IMBALANCED NETWORK TRAFFIC BASED ON MACHINE LEARNING AND DEEP LEARNING

A PROJECT REPORT

Submitted by

S.NAVEEN (731219205007)

M.PRABHU (731219205010)

in partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

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MAY 2023

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BONAFIDE CERTIFICATE

Certified that this project report on **"INTRUSION DETECTION OF IMBALANCED NETWORK TRAFFIC BASED ON MACHINE LEARNING AND DEEP LEARNING"** is the bonafide work of **"S.NAVEEN(731219205007), M.PRABHU(731219205010)"** who carried out the project work under my supervision.

SIGNATURE

Dr.N.SATHYABALAJI,M.E,Ph.D,M.I.S.T.E,
ASSOCIATE PROFESSOR

HEAD OF THE DEPARTMENT

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SIGNATURE

Mr.E.VIJAYANANTH.,M.E.,
ASSISTANT PROFESSOR

SUPERVISOR

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Submitted for the Viva-Voce examination held on 18-05-2023 & AN

INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRCT

In imbalanced network traffic, malicious cyber-attacks can often hide in large amounts of normal data. It exhibits a high degree of stealth and obfuscation in cyberspace, making it difficult for Network Intrusion Detection System(NIDS) to ensure the accuracy and timeliness of detection. This paper researches machine learning and deep learning for intrusion detection in imbalanced network traffic. It proposes a novel Difficult Set Sampling Technique(DSSTE) algorithm to tackle the class imbalance problem. First, use the Edited Nearest Neighbour algorithm(ENN) to divide the imbalanced training set into the difficultset and the easy set. Next, use the KMeans algorithm to compress the majority samples in the difficult set to reduce the majority. Zoom in and out the minority samples' continuous attributes in the difficult set synthesize new samples to increase the minority number. Finally, the easy set, the compressed set ofmajorities in the difficult, and the minority in the difficult set are combined withits augmentation samples to make up a new training set.

The algorithm reduces the imbalance of the original training set and provides targeted data augment for the minority class that needs to learn. It enables the classifier to learn the differences in the training stage better and improve classification performance.In this work, we develop a lightweight attack detection strategy utilizing a supervised machine learning–based FIDS to detect an adversary attempting to inject unnecessary data into the IoT network. Simulation results show that the proposed FIDS -based classifier, aided by a combination of two or three in complex features, can perform satisfactorily in terms of classification accuracy and detection time.

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CHAPTER 1
INTRODUCTION

1.1 WIRELESS SENSOR NETWORK

A WSN (Wireless Sensor Network) consists of a large number of sensors, each of which are physically small devices, and are equipped with the capability of sensing the physical environment, data processing, and communicating wirelessly with other sensors. Generally, we assume that each sensor in a WSN has certain constraints with respect to its energy source, power, memory, and computational capabilities.

The communication paradigm of WSN has its root in wireless ad hoc networks, where network nodes self-organize in an ad hoc fashion, usually on a temporary basis. In a wireless ad hoc network, a group of wireless nodes spontaneously form a network without any fixed and centralized infrastructure. When two nodes wish to communicate, intermediate nodes are called upon to forward packets and to form a multi-hop wireless route.

Due to possibilities of node mobility, the topology is dynamic and routing protocols are proposed to search for end-to-end paths. The network nodes rely on peers for all or most of the services needed and for basic needs of communications. Due to the lack of centralized control and management, nodes rely on fully distributed and self-organizing protocols to coordinate their activities.

In both scenarios, distributed protocols need to accommodate dynamically to the following changes a node may join or leave the network arbitrarily, links may be broken, and nodes may be powered down as a result of node failures or intentional user actions. With respect to the characteristics previously discussed, wireless sensor network (or sensor networks for simplicity) are very similar to wireless ad hoc

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CHAPTER 9

9.1 CONCLUSION

In this paper, we proposed a new algorithm called "MRF " is proposed for the specificities and constraints of sensor networks. Using MRF we aimed at creating a virtual topology to minimize frequent re-election and avoid overall restructuring of the entire network. Our first objective is to reduce energy consumption in all levels. As a result of this work, we plan to exploit the concept of redundancy to enhance results that are related to energy conservation.

Another interesting work that remains to do is to provide in-network processing by aggregating correlated data in the routing protocol and reduces the amount of data that are transported in the network.

Behavioral Intruder disturbance characterization of intruder is an effective alternative to pattern matching in detecting intruder, especially when dealing with polymorphic or obfuscated intruder.

Frothy Disturbance monitoring using Naive Bayesian model has been successfully applied in non-DTN settings, such as filtering email spams and detecting botnets.

We propose a general behavioral characterization of DTN-based proximity intruder. We present look ahead, along with dogmatic filtering and adaptive look ahead, to address two unique challenging in extending Bayesian filtering to DTNs: "insufficient evidence versus evidence collection risk" and "filtering false evidence sequentially and distributed."

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CS8601	MOBILECOMPUTING	L	T	P	C
		3	0	0	3

OBJECTIVES:

- Tounderstandthebasicconceptsofmobilecomputing.
- Tolearnthe basics ofmobiletelecommunicationsystem.
- Tobefamiliar withthenetwork layer protocolsandAd-Hocnetworks.
- Toknowthe basisoftransportandapplicationlayerprotocols.
- Togainknowledgeaboutdifferentmobileplatformsandapplicationdevelopment.

UNITI INTRODUCTION 9

Introduction to Mobile Computing – Applications of Mobile Computing- Generations ofMobile Communication Technologies- Multiplexing – Spread spectrum -MAC Protocols –SDMA-TDMA-FDMA-CDMA

UNITII MOBILETELECOMMUNICATIONSYSTEM 9

IntroductiontoCellularSystems-GSM–Services&Architecture–Protocols–ConnectionEstablishment–FrequencyAllocation–Routing–MobilityManagement–Security–GPRS-UMTS–Architecture–Handover-Security

UNITIII MOBILENETWORKLAYER 9

MobileIP–DHCP–AdHoc–Proactiveprotocol-DSDV,ReactiveRoutingProtocols–DSR,AODV,Hybridrouting–ZRP,MulticastRouting-ODMRP,VehicularAdHocnetworks(VANET)–MANETVsVANET–Security.

UNITIV MOBILETRANSPORTANDAPPLICATIONLAYER 9

MobileTCP–WAP–Architecture–WDP–WTLS–WTP–WSP–WAE–WTAArchitecture –WML

UNITV MOBILEPLATFORMSANDAPPLICATIONS 9

Mobile Device Operating Systems – Special Constraints & Requirements – CommercialMobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry,WindowsPhone–MCommerce–Structure–Pros&Cons-MobilePaymentSystem–Security Issues

TOTAL 45 PERIODS

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OUTCOMES:

At the end of the course, the students should be able to:

- Explain the basics of mobile telecommunication systems
- Illustratethegenerationsoftelecommunicationsystemsinwirelessnetworks
- DeterminethefunctionalityofMAC,networklayerandIdentifyaroutingprotocolforagivenAd hocnetwork
- Explain the functionality of Transport and Application layers
- Develop a mobile application using android/blackberry/ios/Windows SDK

TEXTBOOKS:

1. JochenSchiller,—MobileCommunications‖,PHI,SecondEdition,2003.
2. PrasantKumarPattnaik,RajibMall,—FundamentalsofMobileComputing‖,PHILearningP vt.Ltd,NewDelhi–2012

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1. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobilesystems",ThomsonAsiaPvtLtd,2005.
2. UweHansmann,LotharMerk,MartinS.NicklonsandThomasStober,—Principlesof Mobile Computing‖,Springer, 2003.
3. William.C.Y.Lee,—MobileCellularTelecommunications-AnalogandDigitalSystems‖,SecondEdition,TataMcGrawHillEdition,2006.
4. C.K.Toh,—AdHocMobileWirelessNetworks‖,FirstEdition,PearsonEducation,2002.
5. Android Developers:http://developer.android.com/index.html
6. Apple Developer:https://developer.apple.com/
7. Windows Phone DevCenter:http://developer.windowsphone.com
8. Black Berry Developer:http://developer.blackberry.com

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SOIL ANALYSIS AND CROP RECOMMENDATION USING MACHINE LEARNING

A PROJECT REPORT

Submitted by

T.PRIYADHARSINI **(731219205011)**

M.VAIDEVI **(731219205018)**

In partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

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MAY 2023

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ANNA UNIVERSITY::CHENNAI 600025

BONAFIDE CERTIFICATE

Certified that this project report on **"SOIL ANALYSIS AND CROP RECOMMENDATION USING MACHINE LEARNING "** is the bonafide work of **" T.PRIYADHARSINI(731219205011) and M.VAIDEVI (731219205018),"** who carried out the project work under my supervision. .

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ASSOCIATE PROFESSOR
HEAD OF THE DEPARTMENT
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T.N. Palayam

SIGNATURE
Mrs.P.SANGEETHA.,AP/IT.,M.E
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SUPERVISOR
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T.N. Palayam

Submitted for the Viva- Voce examination held on 18.05.2023 @ FN

INTERNAL EXAMINER

EXTERNAL EXAMINER

PRINCIPAL
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ABSTRACT

In agriculture to grow healthier yield nutrients existing in the soil should be managed properly. Continuous growing of plants affects the soil fertility and its fertility level goes down. Farmers should go to laboratory for testing the fertility of the soil and it's time consuming. An optical transducer is developed to measure and to detect the presence of nitrogen . phosphorus and potassium of soil. Such transducer is needed to decide how much extra contents of these nutrients are to be added to the soil to increase soil fertility. This can improve the quality of soil and reduces the undesired use of fertilizers to be added to the soil. The N, P, and K value of the sample are determined by absorption light of each nutrient. The advance in the technology helps to progress even in the field of agriculture. In proposed framework, soil nutrients can be identified using .Crop yield prediction focuses mostly on agricultural research, which have an enormous impact on taking decisions for example import-export, price, along with crop management. Soil is the main component and plays a significant role in agriculture. Based on the nutrients and pH value of the soil, crop yielding is determined. Farmers are still using traditional approach to analysis the soil quality. The techniques like Data Mining, Artificial Intelligence, Machine Learning, Deep learning and Predictive Analytics are the emerging technologies in research to improve the agricultural field. Predictive analysis is a technique of machine learning that predicts the future outcomes and analysis is based on the historical or past data. Predicting the crop yield well ahead of its harvest would help farmers and market contractors strategize befitting actions to market and store their produce.

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CHAPTER 1
INTRODUCTION

1.1. OVERVIEW

Soil is a natural body comprised of solids (minerals and organic matter), liquid, and gases that occurs on the land surface, occupies space, and is characterized by one or both of the following: horizons, or layers, that are distinguishable from the initial material as a result of additions, losses, transfers, and transformations of energy and matter or the ability to support rooted plants in a natural environment.

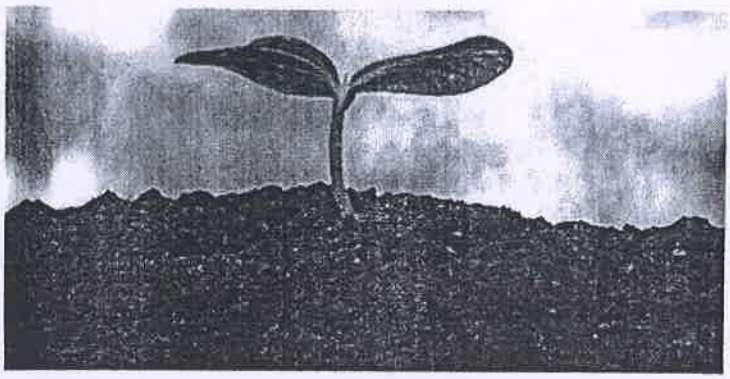

Fig 1.1 : Soil and crop

The upper limit of soil is the boundary between soil and air, shallow water, live plants, or plant materials that have not begun to decompose. Areas are not considered to have soil if the surface is permanently covered by water too deep (typically more than 2.5 meters) for the growth of rooted plants.

The lower boundary that separates soil from the non-soil underneath is most difficult to define. Soil consists of horizons near the Earth's surface that, in contrast to the underlying parent material, have been altered by the interactions of climate, relief, and living organisms over time. Commonly, soil grades at its lower boundary to hard rock or to earthy materials virtually devoid of animals, roots, or other marks of biological activity. For purposes of classification, the lower boundary of soil is arbitrarily set at 200 cm.

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CHAPTER 9

CONCLUSION

In conclusion, "Crops2Go" is a web-based application that allows farmers or users to predict the best crops to grow based on climate, water, soil NPK and rainfall features using LSTM. The application has been developed using Python Flask, Tensor Flow, Keras, and MySQL, and it has undergone extensive testing to ensure its functionality, reliability, and accuracy. The system has several modules such as Data Collection, Pre-processing, Feature Extraction, Classification, Prediction, Performance Analysis, and Alerts/Notification module. The datasets used for training and testing the model have been obtained from Kaggle, and they have been adequately described .

9.1 Future Enhancement

There are several possible future enhancements that could be made to "Crops2Go: Web based Crops to grow Prediction with Climate, Water, Soil NPK and Rainfall Features using LSTM." Here are some ideas:

- Integration of satellite and weather data: By integrating satellite and weather data, it would be possible to create a more comprehensive and accurate prediction model
- Mobile app version: Developing a mobile app version of "Crops2Go" would make
- Language localization: As the application is currently only available in English, language localization could be a potential future enhancement to make the application accessible to farmers who speak different languages.
- Integration of market prices: Adding market prices of crops to the application would help farmers make informed decisions about which crops to grow based on the market demand and potential profit margins be made to "Crops2Go" to make it more useful and accessible to farmers.

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CS8792	CRYPTOGRAPHYANDNETWORKSECURITY	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand Cryptography Theories, Algorithms and Systems.
- To understand necessary Approaches and Techniques to build protection mechanisms in order to secure computer networks.

UNITI INTRODUCTION **9**

Securitytrends-Legal,EthicalandProfessionalAspectsofSecurity,NeedforSecurityatMultiple levels, Security Policies - Model of network security – Security attacks, services andmechanisms—OSIsecurityarchitecture—Classicalencryptiontechniques:substitution techniques, transposition techniques, steganography- Foundations of modern cryptography:perfectsecurity–informationtheory–productcryptosystem–cryptanalysis.

UNITII SYMMETRICKEYCRYPTOGRAPHY **9**

MATHEMATICS OF SYMMETRIC KEY CRYPTOGRAPHY: Algebraic structures - Modulararithmetic-Euclid"s algorithm- Congruence and matrices -Groups, Rings, Fields-Finite fields-SYMMETRICKEYCIPHERS:SDES–Block cipher Principle of DES–Strength of DES – Differential and linear cryptanalysis - Block cipher design principles – Block ciphermode of operation – Evaluation criteria for AES – Advanced Encryption Standard - RC4 –Key distribution.

UNITIII PUBLICKEYCRYPTOGRAPHY **9**

MATHEMATICSOFASYMMETRICKEYCRYPTOGRAPHY:Primes–PrimalityTesting–Factorization – Euler's totient function, Fermat's and Euler's Theorem - Chinese Remainder Theorem— Exponentiation and Alogarithm-ASYMMETRIC KEY CIPHERS:RSA cryptosystem – Key distribution – Key management – Diffie Hellman key exchange -ElGamalcryptosystem–Ellipticcurvearithmetic-Ellipticcurvecryptography.

UNITIV MESSAGEAUTHENTICATIONANDINTEGRITY **9**

Authentication requirement – Authentication function – MAC – Hash function – Security ofhashfunctionandMAC–SHA–Digitalsignatureandauthenticationprotocols–DSS-EntityAuthentication: Biometrics, Passwords, Challenge Response protocols-Authenticationapplications-Kerberos,X.509

UNITV SECURITYPRACTICEANDSYSTEMSECURITY **9**

ElectronicMailsecurity—PGP,S/MIME—IPsecurity—WebSecurity-

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SYSTEMSECURITY:Intruders–Maliciousssoftware–viruses–Firewalls.

TOTAL 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

- Understandthefundamentalsofnetworkssecurity,securityarchitecture,threatsandvulnerabilities
- Applythedifferentcryptographicoperationsofsymmetriccryptographicalgorithms
- Apply the different cryptographic operations of public key cryptography
- ApplythevariousAuthenticationschemestosimulatedifferentapplications.
- Understand various Security practices and System security standards

TEXTBOOK:

1. WilliamStallings,CryptographyandNetworkSecurity:PrinciplesandPractice,PHI3rdEdition,2006.

REFERENCES:

1. C K Shyamala, N Harini and Dr. T R Padmanabhan: Cryptography and Network Security,Wiley IndiaPvt.Ltd
2. BehrouzA.Foruzan,CryptographyandNetworkSecurity,TataMcGrawHill2007.
3. CharlieKaufman,RadiaPerlman,andMikeSpeciner,NetworkSecurity:PRIVATECommunicationinaPUBLICWorld,PrenticeHall,ISBN0-13-046019-2

PRINCIPAL
JKK MUNIRAJAH COLLEGE
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T.N. PALAYAM (Po)-638506.
GOBI (Tk), ERODE (Dt).

DESIGN AND DEVELOPMENT OF HUMAN IDENTIFICATIONAND OBESTACLES DETECTION SYSTEM FOR BLIND DEEP LEARNING

A PROJECT REPORT

Submitted by

R.NANDHINI **(731219205005)**

K.NITHYA **(731219205009)**

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY

J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N.PALAYAM, GOBI-638 506

ANNA UNIVERSITY::CHENNAI 600 025

MAY 2023

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY:: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report on **"DESIGN AND DEVELOPMENT OF HUMAN IDENTIFICATION AND OBSTACLES DETECTION FOR BLIND USING DEEP LEARNING"** is the bonafide work of **"R.NANDHINI (731219205005) and K.NITHYA (731219205009)"** who carried out the project work Under my supervision.

SIGNATURE
Dr.N.SATHYABALAJI.,M.E.Ph.D,M.I.S.T.E,
ASSOCIATE PROFESSOR
HEAD OF THE DEPARTMENT
Dept.of Information Technology
J.K.K.Munirajah College of Technology
T.N.Palayam

16/5/23
SIGNATURE
Mrs.D.NIVETHINI.,M.TECH
ASSISTANT PROFESSOR
SUPERVISOR
Dept.of Information Technology
J.K.K.Munirajah College of technology
T.N.palayam

Submitted for the Viva-Voce examination held on 18.05.2023 f AN.

INTERNAL EXAMINER

18/5/23
EXTERNAL EXAMINER

PRINCIPAL
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ABSTRACT

According to the World Health Organization (WHO), there are millions of visually impaired people in the world, either completely or partially, and they face numerous challenges in detecting obstacles and identifying persons around them. Not only has information technology evolved rapidly, but the spatial cognition theory for blind and visually impaired (BVI) people has also made great strides, which has opened up a new opportunity. As a result, this prototype develops the concept of supplying them with a simple and cost-effective solution via artificial vision. This project has proposed a novel framework by utilizing AI, which makes the framework more straightforward to use specifically for the individuals with visual impedances and to help the society. we developed an intelligent system for visually impaired people using a Machine learning (ML) algorithm, i.e., convolutional neural network (CNN) architecture, to recognize the human and scene objects or obstacles automatically in real-time. The proposed system is able to properly recognize humans in complex environments with multiple moving targets, thus providing to the user a complete set of information, namely presence, position and nature of the available targets. Furthermore, a voice message alerts the blind person about the obstacle or known or unknown person. The proposed work aims to create a user-friendly technology for communication of physically liable people which fulfils the basic amenities of the especially abled persons aiming easy-to-use interface, convenience, portability and cost effectiveness. As a result, the proposed approach enables blind users to manage unaware indoor and outdoor locations.

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

"Visual impairment" is a broad term that is used to refer to any degree of vision loss that affects a person's ability to perform the usual activities of daily life.

Vision Impairment Types

The way in which vision impairments are classified differs across countries. The World Health Organization (the WHO) classifies visual impairment based on two factors: the visual acuity, or the clarity of vision, and the visual fields, which is the area from which you are able to perceive visual information, while your eyes are in a stationary position and you are looking straight at an object.

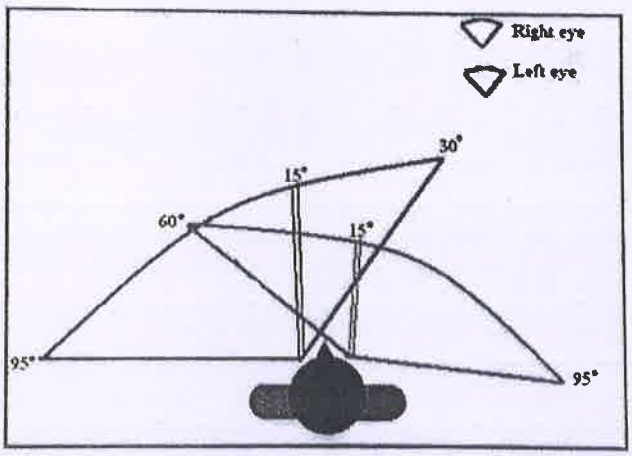

Fig:1.1 visual acuity

The Snellen Chart is used to test visual acuity. Your visual acuity is calculated using two numbers. The first number is the distance between the person reading the chart and the chart. The second number is the distance that a person with normal vision would have to stand from an object to see what you did at 20 feet. For example, a visual acuity of 20/80 means that you can read the chart from 20 feet away as well as a person who could read the chart from 80 feet away.

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CHAPTER 8

8.1 CONCLUSION

The device presented here is a smart glass that incorporate the functionality of a machine vision and obstacle detection and recognition sensor. It can be conveniently advertised and made accessible to the visually disabled population. It would also help to deter future injuries. Smart devices can be transported comfortably and the system camera can be used to track objects and face from the surrounding environment and display in audio format. Each model represents a specific task or mode. The user can have the desired task run independently from the other tasks. The system design, working mechanism and principles were discussed along with some experiment results .Let the visually impaired people can interact more closely with the people around them, without fear of being blurred and uncertain.

8.2 FUTURE ENHANCEMENT

Although it is still a prototype, our system represents a promising avenue for future research aimed at enhancing the spatial awareness of visually impaired people traveling in unfamiliar environments.

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INTERNSHIP

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

Approved by AICTE, New Delhi And Affiliated to Anna University, Chennai.

Accredited by NAAC with "A" grade

T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

INTERNSHIP DETAILS 2022-23

SI.NO	REGISTER NUMBER	STUDENT NAME	NAME OF THE COMPANY	LOCATION	DATE
1	731219205002	GOWTHAM.H	TRIOX TECHNOLOGIES	COIMBATORE	25.01.2023 to 31.01.2023
2	731219205004	MAHANTESH.S			
3	731219205005	NANDHINI.R			
4	731219205007	NAVEEN.S			
5	731219205008	NINGARAJU.S			
6	731219205009	NITHYA.K			
7	731219205010	PRABHU.M			
8	731219205011	PRIYADHARSINI.T			
9	731219205018	VAIDEVI.M			
10	731219205019	VAIGAIRAJ.M			

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T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

MON 16 Jan 2023 at 2.00pm

From: HODIT<hodit@jkkmct.edu.in>

Date: MON 16 Jan 2023 at 2.00pm

Subject: Internship-reg

To: TRIOX TECHNOLOGIES <hr.trioxtechnologies@gmail.com>

Dear Sir,

I am requesting to be joining your **TRIOX TECHNOLOGIES**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following students: **GOWTHAM.H, MAHANTESH.S, NANDHINI.R, NAVEEN.S, NINGARAJU.S, NITHYA.K, PRABHU.M, PRIYADHARSINI.T, VAIDEVI.M, VAIGAIRAJ.M.**

Sincerely,

Final Year IT Student,
J K K Munirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

THUR 19 Jan 2023 at 3.30pm

From: TRIOX TECHNOLOGIES <hr.trioxtechnologies@gmail.com >

Date: THUR 19 Jan 2023 at 3.30pm

Subject: Internship-reg

To: HODIT<hodit@jkkmct.edu.in>

Dear SIR,

I am writing to confirm my acceptance of your internship offer of 25.01.2023 to 31.01.2023 and to tell you how to be joining my **TRIOX TECHNOLOGIES**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

As we discussed, I will report at 8:00 a.m. on JAN 21, 2023 and will be ready to take on my first assignment as an intern from my company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following students: **GOWTHAM.H, MAHANTESH.S, NANDHINI.R, NAVEEN.S, NINGARAJU.S, NITHYA.K, PRABHU.M, PRIYADHARSINI.T, VAIDEVI.M, VAIGAIRAJ.M.**

Sincerely,

HR Manager,
TRIOX TECHNOLOGIES,
Coimbatore.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

TRI O X Technology

TRIOX TECHNOLOGY

INDUSTRIAL TECHNICAL ENGINEERS ASSOCIATION IN COIMBATORE

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms.VAIDEVI.M**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
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GOBI (Tk), ERODE (Dt).

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms.PRIYADHARSINI.T**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk).

TRI O X Technology

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This is to certify that **Ms.NITHYA.K**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

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GOBI (Tk), ERODE (Dt).

TRI O X Technology

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.NINGARAJU.S**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

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JKK MUNIRAJAH COLLEGE
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T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

TRI O X Technology

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.NAVEEN.S**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

PRINCIPAL
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TRI O X Technology

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms.NANDHINI.R**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

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GOBI (Tk), ER.

TRI O X Technology

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INDUSTRIAL TECHNICAL ENGINEERS ASSOCIATION IN COIMBATORE

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.MAHANTESH.S**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM
GOBI (T

TRI O X Technology

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INDUSTRIAL TECHNICAL ENGINEERS ASSOCIATION IN COIMBATORE

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.GOWTHAM.H**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

PRINCIPAL
JKK MUNIRAJAH COLLEGE
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T.N. PALAYAM (Po), 638 506.
GOBI (Tk), ERODE (Dt).

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.GOWTHAM.H**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

PRINCIPAL
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OF TECHNOLOGY
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BOBI (Tk), ERODE (Dt).

TRI O X Technology

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.VAIGAIRAJ.M**, studying **B Tech Information Technology** in **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY** has successfully completed Internship Program from **25.01.2023** to **31.01.2023** at **TRIOX TECHNOLOGIES**,coimbatore

During the Internship, her Performance was good.

Manager

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

Approved by AICTE, New Delhi And Affiliated to Anna University, Chennai.

Accredited by NAAC with "A" grade

T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

INTERNSHIP DETAILS 2022-23

SI.NO	REGISTER NUMBER	STUDENT NAME	NAME OF THE COMPANY	LOCATION	DATE
1	731220205012	KAVIN.P	ACCENT TECHNO SOFT	COIMBATORE	10-7-2023 TO 20-7-2023
2	731220205012	POORANESHWARAN.N			

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

TUE 04Jul 2023 at 1.30pm

From:SUDHAKARS<sudhakars@jkkmct.edu.in>

Date: TUE 04Jul 2023 at 1.30pm
Subject: Internship-reg
To:ACCENTTECHNOSOFT<accenttechno@gmail.com>

Dear Sir,

I am requesting to be joining your **ACCENT TECHNO SOFT** .The requirements are exactly what I have prepared for and hoped todo. I feel confident thatI can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following students: KAVIN.P,POORANESHWARAN.N

Sincerely,

3 rd Year IT Students,
J K KMunirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

FRI 7 JUL 2023 at 3.30pm

From: ACCENTTECHNOSOFT<accenttechno@gmail.com>
Date: FRI 7 JUL 2023 at 3.30pm
Subject:Internship-reg
To: SUDHAKARS<sudhakars@jkkmct.edu.in>

Dear SIR,

I am writing to confirm my acceptance of your internship offer of 10.07.2023 to 20.07.2023 and to tell you how to be joining my **ACCENT TECHNO SOFT**. The requirements are exactly what I have prepared for and hoped to do.I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

As we discussed, I will report at 8:00 a.m. on JULY 8, 2023 and will be ready to take on my first assignment as an intern from my company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following students: KAVIN.P,POORANESHWARAN.N

Sincerely,

HR Manager,
ACCENT TECHNO SOFT,
Coimbatore.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ACCENT TECHNO SOFT

Quality Matters...

An ISO 9001:2015 Certified

20.07.2023
Coimbatore

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.KAVIN P (Reg No:731220205012)** of **III B.Tech (Information Technology)** student from **JKK Munirajah College of Technology** has successfully completed his Internship Training in **" Full Stack Web Development "** at our esteemed organization. The Internship duration is from **10.07.2023 to20.07.2023** .

During this period, he was sincere and regular in attending all the phases of internship program.

For Accent Techno Soft (ATS),

ACCENT TECHNO SOFT CBE 09

Authorized Signatory

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

#203, Nehru Street, Ram Nagar, Coimbatore - 641009

www.accenttechnosoft.com 0422 - 4212232 info@accentechnosoft.com

ACCENT TECHNO SOFT
Quality Matters...

An ISO 9001:2015 Certified

20.07.2023
Coimbatore

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr.POORANESHWARAN N (Reg No:731220205301)** of **III B.Tech (Information Technology)** student from **JKK Munirajah College of Technology** has successfully completed his Internship Training in **" Full Stack Web Development "** at our esteemed organization. The Internship duration is from **10.07.2023 to 20.07.2023 .**

During this period, he was sincere and regular in attending all the phases of internship program.

For Accent Techno Soft (ATS),

ACCENT TECHNO SOFT CBE-09

Authorized Signatory

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

#203, Nehru Street, Ram Nagar, Coimbatore - 641009
www.accenttechnosoft.com 0422 - 4212232 info@accentechnosoft.com

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

Approved by AICTE, New Delhi And Affiliated to Anna University, Chennai.

Accredited by NAAC with "A" grade

T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

INTERNSHIP DETAILS 2022-23

SI.NO	REGISTER NUMBER	STUDENT NAME	NAME OF THE COMPANY	LOCATION	DATE
1	731220205004	DEEPAK.A	ANJANA INFO TECH	RAJAPALAYAM	3-7-2023 TO 13-7-2023
2	731220205019	RAMKUMAR.R			

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

TUE 27Jun 2023 at 1.30pm

From:SUDHAKARS<sudhakars@jkkmct.edu.in>

Date: TUE 27Jun 2023 at 1.30pm

Subject: Internship-reg

To: ANJANAINFOTECH <anjanainfotech@gmail.com>

Dear Sir,

I am requesting to be joining your **ANJANA INFO TECH** .The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following students: DEEPAK.A,RAMKUMAR.R

Sincerely,

3 rd Year IT Students,
J K KMunirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

FRI 30 JUN 2023 at 3.30pm

From: ANJANAINFOTECH<anjanainfotech@gmail.com>

Date: FRI 30 JUN 2023 at 3.30pm

Subject:Internship-reg

To: SUDHAKARS<sudhakars@jkkmct.edu.in>

Dear SIR,

I am writing to confirm my acceptance of your internship offer of 03.07.2023 to 13.07.2023 and to tell you how to be joining my **ANJANA INFO TECH**. The requirements are exactly what I have prepared for and hoped to do.I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

As we discussed, I will report at 8:00 a.m. on JULY 2, 2023 and will be ready to take on my first assignment as an intern from my company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following students: DEEPAK.A,RAMKUMAR.R

Sincerely,

HR Manager,
ANJANA INFO TECH,
Rajapalayam.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Anjana Infotech
Your Dream We Display

Date: 13.07.2023

INTERNSHIP TRAINING COMPLETION CERTIFICATE

This is to certify that the internship training entitled Mobile App Development submitted by **Mr. A. Deepak (731220205004)** Studying B.Tech(IT) at, J.K.K Munirajah College of Technology has undergone internship training at our **Anjana Infotech Private Limited** Rajapalayam, as a collaborative activity from 03.07.2023 to 13.07.2023. He has successfully Completed his Internship under my Guidance and is worthy of consideration for the same.

Thanking you.

Anjana Infotech
www.anjanainfotech.in
9787970633
Rajapalayam - 626 117

M SAKTHI SARAVANAN
Proprietor

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

info@anjanainfotech.in
anjanainfotech.in
359 88/3, Illathupillamar Complex, Near Gandhi Statue
Rajapalayam -626 117.
+91 97879 70633 | +91 9787 248063

Anjana Infotech
Your Dream We Display

Date: 13.07.2023

INTERNSHIP TRAINING COMPLETION CERTIFICATE

This is to certify that the internship training entitled Mobile App Development submitted by **Mr. R. Ramkumar (731220205019)** Studying B.Tech (IT) at, J.K.K Munirajah College of Technology has undergone internship training at our **Anjana Infotech Private Limited Rajapalayam, as a collaborative activity from 03.07.2023 to 13.07.2023. He has successfully Completed his Internship under my Guidance and is worthy of consideration for the same.**

Thanking you.

Anjana Infotech
www.anjanainfotech.in
9787970633
Rajapalayam - 626 117

M SAKTHI SARAVANAN
Proprietor

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INTERNSHIP DETAILS 2022-23

SI.NO	REGISTER NUMBER	STUDENT NAME	NAME OF THE COMPANY	LOCATION	DATE
1	731220205009	GOKUL.S	APPIN TECH	COIMBATORE	30.6.2023 to 4.7.2023
2	731220205016	PANDIYARAJ.C			
3	731220205020	RAVISANKARAN.N			
4	731220205024	THANGESHWARI.G			

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Gmail

Internship
1message

FRI 23 Jun 2023 at 2.00pm

From: SUDHAKARS<sudhakars@jkkmct.edu.in>

Date: FRI 23Jun 2023 at 2.00pm

Subject: Internship-reg

To:APPIN<appintechhr@gmail.com>

Dear Sir,

I am requesting to be joining your **APPIN TECH**.The requirements are exactly what I have prepared for and hoped todo. I feel confident thatI can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following students: **GOKUL.S, PANDIYARAJ.C, RAVISANKARAN.N, THANGESHWARI.G**

Sincerely,

3 rd Year IT Students,
J K K Munirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.

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GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

MON 26 Jun 2023 at 3.30pm

From: APPIN<appintechhr@gmail.com>

Date: MON26Jun 2023 at 3.30pm

Subject:Internship-reg

To: SUDHAKARS<sudhakars@jkkmct.edu.in>

Dear MADAM,

I am writing to confirm my acceptance of your internship offer of 30-6-2023 to 4.7.2023and to tell you how to be joining my **APPIN TECH**. The requirements are exactly what I have prepared for and hoped to do.I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

As we discussed, I will report at 9:00 a.m. on JUNE28, 2023 and will be ready to take on my first assignment as an intern from my company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following students: **GOKUL.S, PANDIYARAJ.C, RAVISANKARAN.N, THANGESHWARI.G**

Sincerely,

HR Manager,
APPIN TECH ,
COIMBATORE

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appin
COIMBATORE

Date : 04.07.2023

INTERNSHIP CERTIFICATE

This is to inform that **Mr. GOKUL S (731220205009)**, Third year, **BACHELOR OF TECHNOLOGY** in **INFORMATION TECHNOLOGY**, student of **J. K. K MUNIRAJAH COLLEGE OF TECHNOLOGY, T.N.PALAYAM**, has attended **Internship training** in our organization from **June 30th 2023 to July 04th 2023.**

During this **Internship training**, He has learned the overview concepts of **DATA SCIENCE WITH PYTHON.**

Thanking You.

144, Sengupta Street, Ram Nagar,
Coimbatore-641009

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CS8691	ARTIFICIALINTELLIGENCE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the various characteristics of Intelligent agents
- To learn the different search strategies in AI
- To learn to represent knowledge in solving AI problems
- To understand the different ways of designing software agents
- To know about the various applications of AI.

UNITI INTRODUCTION 9

Introduction–Definition-FutureofArtificialIntelligence–CharacteristicsofIntelligentAgents–TypicalIntelligentAgents–ProblemSolvingApproachtoTypicalAIproblems.

UNITII PROBLEMSOLVINGMETHODS 9

Problem solving Methods - Search Strategies- Uninformed - Informed - Heuristics - Local SearchAlgorithmsandOptimizationProblems-SearchingwithPartialObservations-ConstraintSatisfactionProblems—ConstraintPropagation-BacktrackingSearch-GamePlaying-Optimal Decisions in Games–Alpha-Beta Pruning-Stochastic Games

UNITIII KNOWLEDGEREPRESENTATION 9

First Order Predicate Logic – Prolog Programming – Unification – Forward Chaining-Backward Chaining – Resolution – Knowledge Representation - Ontological Engineering-Categories and Objects – Events - Mental Events and Mental Objects - Reasoning Systems for Categories -Reasoning with Default Information

UNITIV SOFTWAREAGENTS 9

ArchitectureforIntelligentAgents–Agentcommunication–NegotiationandBargaining–ArgumentationamongAgents–TrustandReputationinMulti-agentsystems.

UNITV APPLICATIONS 9

AI applications – Language Models – Information Retrieval- Information Extraction – Natural Language Processing - Machine Translation – Speech Recognition – Robot – Hardware – Perception—Planning—Moving

TOTAL:45PERIODS

OUTCOMES:

Up on completion of the course, the students will be able to:

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- Use appropriate search algorithms for any AI problem
- Represent a problem using first order and predicate logic
- Provide the apt agent strategy to solve a given problem
- Design software agents to solve a problem
- Design applications for NLP that use Artificial Intelligence.

TEXTBOOKS:

1 S.RussellandP.Norvig,"ArtificialIntelligence:AModernApproach‖,PrenticeHall,ThirdEdition,2009.

2 I.Bratko,—Prolog:ProgrammingforArtificialIntelligence‖,Fourthedition,Addison-WesleyEducationalPublishersInc.,2011.

REFERENCES:

1. M.TimJones,—ArtificialIntelligence:ASystemsApproach(ComputerScience)‖,JonesandBartlettPublishers,Inc.;FirstEdition,2008
2. NilsJ.Nilsson,—TheQuestforArtificialIntelligence‖,CambridgeUniversityPress,2009.
3. WilliamF.ClocksinandChristopherS.Mellish,‖ProgramminginProlog:UsingtheISOStandard‖,Fifth Edition,Springer,2003.
4. GerhardWeiss,—MultiAgentSystems‖, SecondEdition,MITPress,2013.
5. DavidL.PooleandAlanK.Mackworth,—ArtificialIntelligence:FoundationsofComputationalAgents‖,CambridgeUniversityPress,2010.

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COIMBATORE

Date : 04.07.2023

INTERNSHIP CERTIFICATE

This is to inform that **Ms.THANGESHWARI G (731220205024)**, Third year, **BACHELOR OF TECHNOLOGY in INFORMATION TECHNOLOGY**, student of **J. K. K MUNIRAJAH COLLEGE OF TECHNOLOGY, T.N.PALAYAM**, has attended Internship training in our organization from June 30th 2023 to July 04th 2023.

During this Internship training, She has learned the overview concepts of **DATA SCIENCE WITH PYTHON.**

Thanking You.

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Date : 04.07.2023

INTERNSHIP CERTIFICATE

This is to inform that **Mr. PANDIYARAJ C(731220205016)**, Third year, **BACHELOR OF TECHNOLOGY in INFORMATION TECHNOLOGY**, student of **J. K. K MUNIRAJAH COLLEGE OF TECHNOLOGY, T.N.PALAYAM**, has attended **Internship training** in our organization from **June 30th 2023 to July 04th 2023.**

During this Internship training, He has learned the overview concepts of **DATA SCIENCE WITH PYTHON.**

Thanking You.

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Date : 04.07.2023

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This is to inform that **Mr. RAVISANKARAN N (731220205020)**, Third year, **BACHELOR OF TECHNOLOGY in INFORMATION TECHNOLOGY**, student of **J. K. K MUNIRAJAH COLLEGE OF TECHNOLOGY, T.N.PALAYAM**, has attended **Internship training** in our organization from **June 30th 2023 to July 04th 2023.**

During this Internship training, He has learned the overview concepts of **DATA SCIENCE WITH PYTHON.**

Thanking You.

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INTERNSHIP DETAILS 2022-23

SI.NO	REGISTER NUMBER	STUDENT NAME	NAME OF THE COMPANY	LOCATION	DATE
1	731220205001	AJAYSRI.A	ETHER INFO TECH	COIMBATORE	4-7-2023 TO 18-7-2023
2	731220205011	KALAISELVI.K			
3	731220205017	PARVATHY.A			
4	731220205018	PRIYANKA.S			
5	731220205303	SHILPA.C			

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Gmail

Internship
1message

WED 28 Jun 2023 at 2.00pm

From: SUDHAKARS<sudhakars@jkkmct.edu.in>

Date: WED 28Jun 2023 at 2.00pm

Subject: Internship-reg

To:ETHER INFO TECH<prasanth@etherinfotech.com>

Dear Sir,

I am requesting to be joining your **ETHER INFO TECH.**The requirements are exactly what I have prepared for and hoped todo. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following students: **AJAYSRI.A, KALAISELVI.K, PARVATHY.A, PRIYANKA.S, SHILPA.C**

Sincerely,

3 rd Year IT Students,
J K K Munirajah College of Technology,
T.N.Palayam, Erode-638506, Tamilnadu.

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T.N. PALAYAM (Po)-638506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

FRI 30 Jun 2023 at 3.30pm

From: ETHER INFO TECH<prasanth@etherinfotech.com>

Date: FRI 30 Jun 2023 at 3.30pm
Subject:Internship-reg

To: SUDHAKARS<sudhakars@jkkmct.edu.in>

Dear Sir,

I am writing to confirm my acceptance of your internship offer of 04-7-2023 to 18.7.2023 and to tell you how to be joining my **ETHER INFO TECH**. The requirements are exactly what I have prepared for and hoped to do.I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

As we discussed, I will report at 9:00 a.m. on July 3, 2023 and will be ready to take on my first assignment as an intern from my company. Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following students: **AJAYSRI.A, KALAISELVI.K, PARVATHY.A, PRIYANKA.S, SHILPA.C**

Sincerely,

HR Manager,
ETHER INFO TECH,
COIMBATORE.

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ETHER
iNFCJTECH

Date: 18/07/2023

INTERNSBIP CERTIFICATE

This is to inform that Ms. AJAY SRI .A, 3rd year, B.TECH — INFORMATION TECHNOLOGY, student of JKK MUNIRAJAH COLLEGE OF TECHNOLOGY, ERODE, has attended Internship training in our organization from July 04th 2023 to July 18th 2023.

During this Internship training, she has learned the overview concepts of PYTHON.

Thanking You.

For Ether Infotech

Authorised Signatory

35/4, 2nd Floor, Arputham Towers, Desabandhu Street, Ram Nagar, Coimbatore - 641009
W: Www.etherinfotech.com | T: 0422 - 3511420 | M: 95002 95905 | E: Info@etherinfotech.com

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ETHER iNFOTECH

Date: 18/07/2023

INTERNSHIP CERTIFICATE

This is to inform that **Ms. KALAISELVI .K, 3rd year, B.TECH – INFORMATION TECHNOLOGY,** student of **JKK MUNIRAJAH COLLEGE OF TECHNOLOGY,** ERODE, has attended Internship training in our organization from July 04th 2023 to July 18th 2023.

During this Internship training, she has learned the overview concepts of **PYTHON.**

Thanking You.

For Ether Infotech

Authorised Signatory

35/4, 2nd Floor, Arputham Towers, Desabandhu Street, Ram Nagar, Coimbatore - 641009
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GOBI (Tk), ERODE (Dt).

ETHER INFOTECH

Date: 18/07/2023

INTERNSHIP CERTIFICATE

This is to inform that **Ms. PARVATHY .A, 3rd year, B.TECH – INFORMATION TECHNOLOGY,** student of **JKK MUNIRAJAH COLLEGE OF TECHNOLOGY,** ERODE, has attended Internship training in our organization from July 04th 2023 to July 18th 2023.

During this Internship training, she has learned the overview concepts of **PYTHON.**

Thanking You.

For Ether Infotech

Authorised Signatory

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GOBI (Tk), ERODE (Dt).

ETHER INFOTECH

Date: 18/07/2023

INTERNSHIP CERTIFICATE

This is to inform that **Ms. PRIYANKA .S, 3rd year, B.TECH – INFORMATION TECHNOLOGY,** student of **JKK MUNIRAJAH COLLEGE OF TECHNOLOGY,** ERODE, has attended Internship training in our organization from July 04th 2023 to July 18th 2023.

During this Internship training, she has learned the overview concepts of **PYTHON.**

Thanking You.

For Ether Infotech

Authorised Signatory

PRINCIPAL
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ETHER iNFOTECH

Date: 18/07/2023

INTERNSHIP CERTIFICATE

This is to inform that **Ms. SHILPA .C, 3rd year, B.TECH – INFORMATION TECHNOLOGY,** student of **JKK MUNIRAJAH COLLEGE OF TECHNOLOGY,** ERODE, has attended Internship training in our organization from July 04th 2023 to July 18th 2023.

During this Internship training, she has learned the overview concepts of **PYTHON.**

Thanking You.

For Ether Infotech

Authorised Signatory

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