2.3.3 Ratio of mentor to students for academic and stress related issues(10)

Sl.No	Content	PageNo.
1	Ratio of Mentor to Students	2
2	List of Mentee and Mentors	3
3	Sample Counseling details	58

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2.3.3 Ratio of mentor to students for academic and stress related issues(10)			
Year	Number of students enrolled in the institution	Number of full time teachers	Mentor: Mentee Ratio
2022-2023	573	94	1:10

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DEPARTMENT OF AUTOMOBILE ENGINEERING

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR: IV**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731219102001	AJAY KRISHNA	Mr.V.P.Arulmurugan AP/AUTO 7010983658 vaparul@gmail.com
2	731219102002	ARAVINTH R	
3	731219102003	DHINESH KUMAR K	
4	731219102004	HARIPRASATH T	
5	731219102007	SIRANJEEVI G	
6	731219102008	UMAMAHESWARAN D	
7	731219102301	MOHA NKUMAR M	
8	731219102302	RAJ R	
9	731219102303	SANJAYKRISHNAN S	

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DEPARTMENT OF AUTOMOBILE ENGINEERING

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR: III**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731220102001	DHANALAKSHMANA.B	Mr.V.P.Arulmurugan AP/AUTO 7010983658 vaparul@gmail.com

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Circular–Mentor and Mentee List

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	73122102001	KAVIN P	Mr.P.Eswaran AP/AUTO 9677807930 eswaranp@jkkmct.edu.in
2	73122102002	RAJKUMAR B	

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Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: I**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731222102001	ELANGOVAN K	Mr.E.Mathivanan AP/S&H 8056475969 emathivanan@jkkmct.edu.in .. .
2	731222102002	PRADEEPKUMAR V	
3	731222102003	PRAJEESH K	
4	31222102004	PRATHISH DANIEL F	
5	731222102005	SOORAJ P	

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Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: IV**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731219103002	ANILKUMAR BALDABOI	Mrs.P.Reena AP/CIVIL 9600264870 reenapalanisamy@gmail.com
2	731219103003	DEBACHAND MUDULI	

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Circular–Mentor and Mentee List

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731220103001	DIVAKAR R	Mrs.P.Reena AP/CIVIL 9600264870 reenapalanisamy@gmail.com

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731221103301	SUSITHRA S	Mrs.P.Reena AP/CIVIL 9600264870 reenapalanisamy@gmail.com

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731222103001	ANANDHAN.B	Mr.E.Mathivanan AP/S&H 8056475969 emathivanan@jkkmct.edu.in

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ACADEMIC YEAR 2022-2023 YEAR: IV

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731219104004	BALAKRISHNAN.V	Mr.R.Gnanasekar AP/CSE 9894982451 gnanasekar272@gmail.com
2	731219104005	BHUVANESHWARI.M	
3	731219104006	DHATCHANA MOORTHI.A.P	
4	731219104007	ELAKKIYA.D	
5	731219104010	INDHUMATHI.P	
6	731219104011	MADHAN.M	
7	731219104012	MAHESHWARI.M	
8	731219104014	MOHANRAJ.S	
9	731219104015	PAVITHRA.R	
10	731219104016	PRATHAP.N	
11	731219104017	PRAVIN.S	Dr.S.B.Manoojkumaar Professor/CSE 9944221667 manoojkumaarsb@gmail.com
12	731219104018	PRIYA.S	
13	731219104019	RAMYA.V	
14	731219104021	SANTHA MOORTHI.R	
15	731219104022	SENTHIL KUMAR.V	
16	731219104023	SUBASH CHANDRAN.P	
17	731219104024	SUDHA DHARANI.R	
18	731219104025	SURIYA.R	
19	731219104027	TAMILSELVAN.A	
20	731219104028	VENNILA.C	

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731220104001	ABINAYA G	Mrs.P.Poornapriya AP/CSE 9698197965 poornapriyap@jkkmct.edu.in
2	731220104003	BALU R	
3	731220104004	CHARLES WILLIAM.L	
4	731220104005	DEEPAK.S	
5	731220104006	DEEPIKA.S	
6	731220104007	DHARANISELVI. M	
7	731220104009	JAGATHESWARAN.P	
8	731220104010	KARUNYAA.M	
9	731220104011	KATHIRESAN.K	
10	731220104012	KAVIN.M	
11	731220104014	LOGANATHAN.T	Mr.K.S.Vinothan AP/CSE 9789389647 vinothanks@gmail.com
12	731220104019	NIRMALRAJ.S	
13	731220104021	RAMYA.S	
14	731220104022	ROHITH.R	
15	731220104023	ROSHMA.J	
16	731220104024	SIVALINGAM.K	
17	731220104025	SUNDARAGANESAN.K	
18	731220104028	VIGNESH.M	

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19	731220104029	VINISHA.T	
20	731220104030	VINITHA.A	
21	731220104031	VINOTHKUMAR.R	Mrs.V.Nirosha AP/CSE 6383860677 niroshcse@gmail.com
22	731220104301	BOOPALAN.M	
23	731220104302	DHAMODARAN.G	

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ACADEMIC YEAR 2022-2023 **YEAR: II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731221104001	AADHI SURYA K	Mr.E.Ananth AP/CSE 9791847207 ananthe@jkkmct.edu.in
2	731221104004	ARUL MURUGAN S	
3	731221104005	BABU SHANKAR S	
4	731221104007	BAMBAVASAN V	
5	731221104008	CHANDRA PRAKASH K	
6	731221104009	DHAKSHINA MOORTHY E	
7	731221104012	DURGA K	
8	731221104013	GUNASEKARAN P	
9	731221104014	GUNASEKARAN S	
10	731221104015	HARIPRABHA V	
11	731221104017	KAMALESH K	Mrs.M.C.Savithri ASP/CSE 93615 37250 savithric@jkkmct.edu.in
12	731221104021	LALITHA T	
13	731221104022	MADHAN G	
14	731221104025	MOUSIKA S	
15	731221104026	NANDHINI P	
16	731221104027	PANDIYARAJ P	
17	731221104028	PRIYA DHARSHINI S	
18	731221104029	RAVIKUMAR.P	

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
19	731221104031	RUBIKA G	
20	731221104033	SENTHILVEL S	
21	731221104034	SHYAM KUMAR S	Mrs.P.Sasireka AP/CSE 9659949199 sasirekap2021@gmail.com
22	731221104035	SUGANYA K	
23	731221104036	SURYA S	
24	731221104037	SUSHMINA M	
25	731221104038	VASANTH KUMAR S	
26	731221104039	VIGNESH M	
27	731221104040	YAMUNA K	
28	731221104301	AMUTHAMALAR.R	
29	731221104302	BHARANIDHARAN.M	
30.	731221104303	GAYATHRI.R	
31	731221104305	NANDHINI.M	Mr.S.Satheesh AP/CSE 9095156661 satheesh.sakthivel@gmail.com
32	731221104306	SNEHA.L	
33	731221104307	SRINIVAS.V	
34	731221104308	SUBASHINI.P	
35	731221104701	NIKETHA.S	

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Circular–Mentor and Mentee List

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731222104001	ABINAYA.P	Mrs.M.Senbagam AP/S&H 9659221677 senbagamm@jkkmct.edu.in
2	731222104002	BHARATHKRISHNAN.V	
3	731222104003	CHANDRAKALA.N	
4	731222104004	CHANDRU.K	
5	731222104005	DEEPA.T	
6	731222104006	DEVADHARSHINI.M	
7	731222104007	DHANASEKARAN.P	
8	731222104008	ELAKKIYA.K	
9	731222104009	GIBSONSHANTHAKUMAR.R	
10	731222104010	GOKILA.S	
11	731222104011	GOKULRAJA.G	Mrs.S.Kiruthika AP/S&H 9597363115 kiruthikas@jkkmct.edu.in
12	731222104012	HAFILA.A	
13	731222104013	INIKA.C	
14	731222104014	JAYASHREE.K	
15	731222104015	JAYASREE.D	
16	731222104016	JAYASURYA.B	
17	731222104017	JEGADEESHWARAN.K	
18	731222104018	JOTHI.N	
19	731222104019	JOTHI.S	
20	731222104020	KARTHI.K	

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Circular–Mentor and Mentee List

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
21	731222104021	KARUNYA.K	Mr.S.Premkumar AP/S&H 9994600828 premkumarp@jkkmct.edu.in
22	731222104022	KEERTHIGA.V	
23	731222104023	LAKSHMI.B	
24	731222104024	LINGARAJU.K	
25	731222104025	NEETHU.S	
26	731222104026	NIVETHA.P	
27	731222104027	POOMATHI.S	
28	731222104028	PRAZWALB	
29	731222104029	PUSHPASRI.M	
30	731222104030	RAKSHITHA.V	
31	731222104031	SAHEER.H	Mr.M.Ponnusamy HOD/S&H 995258282 ponnusamym@jkkmct.edu.in
32	731222104032	SANJAIKUMAR.S	
33	731222104033	SANJAY.V	
34	731222104034	SANJAYKUMAR.S	
35	731222104035	SATHIYALAKSHMI.M	
36	731222104036	SHAKTHI.S	
37	731222104037	SIDDARAJU.S	
38	731222104038	SIDHARAJ.S	
39	731222104039	SOWDESWARI.A	
40	731222104040	SOWNDHAR.D	

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
41	731222104041	SUMITHRA.S	Mr.M.Ponnusamy HOD/S&H 995258282 ponnusamym@jkkmct.edu.in

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Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: IV**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731219105003	BHARATHIDASAN S	Mr.A.Chinnathambi AP/EEE 9940987885 chinnathambia@jkkmct.edu.in
2	731219105004	DEEPA S	
3	731219105005	DEEPAK P	
4	731219105006	DHARANI P	
5	731219105007	DHIVAKARAN R	
6	731219105010	JANAKRISHNAN M	
7	731219105012	KARTHIKPRABHU P	
8	731219105013	MAGESHWARI K	
9	731219105014	MURALITHARAN P	
10	731219105015	NANDHA KUMAR S	
11	731219105016	NANDHINI G	Mr.S.M.Pranesh AP/EEE 9080470505 mathy_pranesh@yahoo.co.in
12	731219105017	NIVETHAVARANI V	
13	731219105019	SELVI S	
14	731219105021	TAMILSELVAM A	
15	731219105022	YUVARAJA S	
16	731219105301	AMSAVENI.M	

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Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: III**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731220105002	DHINESH.P	Mr.G.Palanisamy AP/EEE 9487759811 palanieeeg@gmail.com
2	731220105003	ISAKKIRAJA.P	
3	731220105004	KIRUBASANKAR.C	
4	731220105005	MUKESH.S	
5	731220105006	NAVEENKUMAR.G	
6	731220105007	ROHAN.R	
7	731220105009	SIVAGIRI.K	
8	731220105011	THIRUMARAN DILEEBAN.S	
9	731220105301	MAHESHWARI P	

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Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731221105001	BALAJI B	Mr.A.Vigneshkumar AP/EEE 9500678747 vigneshkumarannamalai @gmail.com
2	731221105002	DEVI M	
3	731221105003	DHAYANITHI M	
4	731221105004	HARIHARAN S	
5	731221105006	JOTHI S	
6	731221105007	KARTHICK M	
7	731221105009	ROJA S	
8	731221105010	SANTHOSH M	
9	731221105011	SANJAY M V	
10	731221105012	SARANKUMAR A	
11	731221105013	SARAVANAN A	Mrs.R.Dhivya AP/EEE 8883211814 dhivyar@jkkmct.edu.in
12	731221105014	SATHISH P	
13	731221105015	VENKATESHWARAN J	
14	7312211105301	AGIMISH .K.G	
15	731221105302	KARTHICK .C	
16	731221105303	RANJITHA .N	
17	731221105305	TAMILSELVAN .T	

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ACADEMIC YEAR 2022-2023 **YEAR: I**

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1	731222105001	AKASH.R	Mrs.N.Chithra AP/S&H 9894718457 chithran@jkkmct.edu.in
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3	731222105003	ELANGOVAN.S	
4	731222105004	GOPIKA.N	
5	731222105005	KARTHIK.S	
6	731222105006	LOGESWARI.E	
7	731222105007	MADHAN.M	
8	731222105008	MANIKANDAN.M	
9	731222105009	MANIKANDAN.S	
10	731222105010	MEGANATHAN.P	
11	731222105011	MOUNISHWARAN.K	Mr.E.Mathivanan AP/S&H 8056475969 emathivanan@jkkmct.edu.in
12	731222105012	MUTHUKUMARAN .S	
13	731222105013	MYTHILI.M	
14	731222105014	NITHISH KUMAR.S	
15	731222105015	PARANJOTHI.P	
16	731222105016	PRAVEENKUMAR V	
17	731222105017	RASU R	
18	731222105018	RATHIPRIYA J	
19	731222105019	RAVI.R	

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S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
20	731222105020	SANTHOSHKUMAR M	
21	731222105021	SARAN RAJ G	Mr.S.Anbuthangam AP/S&H 9789559933 anbuthangams@jkkmct.edu.in
22	731222105022	SASIKUMAR S	
23	731222105023	SENATHIPATHINATHAN K	
24	731222105024	SIDDARAJI S	
25	731222105025	SIVASAKTHI S	
26	731222105026	SRIKANTH P	
27	731222105027	SURYA S K	
28	731222105028	SUTHARSAN P	
29	731222105029	VASANTHAKUMAR R	

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ACADEMICYEAR 2022-2023 **YEAR:IV**

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3	731219106006	K.KEMPARAJ	
4	731219106008	M.MATHAN KUMAR	
5	731219106009	K.MOHAN	
6	731219106010	M.MUTHUPANDI	
7	731219106011	P. NANDHINI	
8	731219106012	M.NARMATHA	
9	731219106014	R.RAMESH PRABHU	
10	731219106015	M.ROHINI	
11	731219106016	A.SABARI GAYATHRI	Mrs.U.Sasikala AP/ECE 9715084075 sasi302009@gmail.com
12	731219106018	K.SATHIYA PRIYA	
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14	731219106021	M.UDHAYA KUMAR	
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ACADEMIC YEAR 2022-2023 **YEAR:III**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
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3	731220106005	MUTHUKUMAR.M	
4	731220106007	SUGUNADEVI.M	
5	731220106008	VIKRAM.V	
6	731210106301	JANARTHANAN.K	

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ACADEMIC YEAR 2022-2023 **YEAR: II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
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3	731221106009	SAKTHISIVAN K	
4	731221106010	SANTHIYA Y	
5	731221106011	SATHASIVAN R	
6	731221106012	SHARMILA V	
7	731221106014	SUBASH K	
8	731221106015	VENESWARI	
9	731221106301	ARTHI V	
10	731221106302	SHARMILA V	
11	731221106303	SOUNDARIYA S	Mrs.N.Gomathi AP/ECE 9524927887 gomathiece5@gmail.com

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Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR:I**

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3	731222106003	ARCHANA.K	
4	731222106004	ARCHANA.P	
5	731222106005	BALAJI.S	
6	731222106006	DEVI.U	
7	731222106007	DHANRAJ.R	
8	731222106008	DHARANI.K.S	
9	731222106009	DHATCHINAMOORTHY J	
10	731222106010	DINESH.S	
11	731222106011	HARIHARAN.B	Mrs.R.Shanthi AP/S&H 9942651209 shanthir@jkkmct.edu.in
12	731222106012	HARINI.S	
13	731222106013	INDRAJITH.A	
14	731222106014	JAYASRI D	
15	731222106015	JEEVA DEEPIKA.S	
16	731222106016	LAVANYA.M	
17	731222106017	MAGENDHRA.K	
18	731222106018	NARMADHA.N	

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ACADEMIC YEAR 2022-2023 **YEAR: I**

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20	731222106020	PAVADHARANI.K	
21	731222106021	PRASANTH.P	Ms.K.Poongothai AP/S&H 9715906177 poongothaic@jkkmct.edu.in
22	731222106022	RAGAVAN.S	
23	731222106023	RAMYA J	
24	731222106024	RESHMA J	
25	731222106025	RISHIKESAN.R	
26	731222106026	RIYAS MOHAMMED.M	
27	731222106027	ROGAN.B	
28	731222106028	SATHRAPATHI.N	
29	731222106029	SANTHOSH.E	
30	731222106030	SIVARANJANI.G	
31	731222106031	SUDHI.A	
32	731222106032	TAMILSELVAN M	

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34	731222106034	THILAK.M	
35	731222106035	VAISHNAVI.A	
36	731222106036	VIGNESH.V	
37	731222106037	VIJAYAKUMARI.M	

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Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: IV**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731219114001	ANISHKUMAR L	Mr.P.Prabhuraj AP/MECH 9942241051 prabhurajmeed@gmail.com
2	731219114002	ARUNKUMAR S	
3	731219114003	BALAMURUGAN V	
4	731219114005	DHARMARAJ M	
5	731219114006	DINESH S	
6	731219114007	DINESH KUMAR R	
7	731219114009	KARTHI M	
8	731219114011	KAVINKUMAR M	
9	731219114013	MANOJ J	
10	731219114014	MANO RANJITH K	
11	731219114015	MURUGESH M	Mr.P.Suresh AP/MECH 9789410313 sureshsam985@gmail.com
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13	731219114021	SATHISH KUMAR S	
14	731219114022	SIVANANTH K	
15	731219114023	THAMARAI SELVAN	
16	731219114024	VIGNESH P	
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DEPARTMENT OF MECHNICAL ENGINEERING

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ACADEMIC YEAR 2022-2023 **YEAR: III**

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4	731220114004	MAHENDRAN D	
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6	731220114006	PARTHIPAN M	
7	731220114007	RAMESH B	
8	731220114008	RAVINDRAN L	
9	731220114010	SENTHILKUMAR G	
10	731220114011	THIRUMURUGAN M	
11	731220114012	THIRUNAVUKKARASU S	Mr.M.Sivakumar AP/MECH 9597553594 siva36mech@gmail.com
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13	731220114301	GOWRISANKAR M	
14	731220114302	KAVIN A	
15	731220114501	PALANIKUMAR M	

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ACADEMIC YEAR 2022-2023 **YEAR: II**

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3	731221114005	PRABAKARAN S	
4	731221114008	SATHEESH C	
5	731221114009	VAIRAMUTHU S	
6	731221114010	VIGNESH S	

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2	731222114002	GOWTHAM V	
3	731222114003	JEEVA P	
4	731222114004	LAKSHMANAN.P	
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6	731222114006	PARTHASARATHI R	
7	731222114007	RAGUPATHI R	
8	731222114008	RAJESHKUMAR K	
9	731222114010	SANTHOSH M	
10	731222114012	SIVAKUMAR M	
11	731222114013	SURIYAKUMAR S	
12	731222114014	YOGA PRAKASH M	

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DEPARTMENT OF INFORMATION TECHNOLOGY

Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: IV**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731219205002	GOWTHAM.H	Mr.A.Sambathkumar AP/IT 9688854842 sambathkumar9486 @gmail.com
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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Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR: III**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731220205001	AJAYSRI. A	Mr.S.Pradeepan AP/IT 9952522210 pradeepans@jkkmct.edu.in
2	731220205004	DEEPAK.A	
3	731220205006	DHARANI.M	
4	731220205007	DHINESHKUMAR .M	
5	731220205008	DINESH.S	
6	731220205009	GOKUL.S	
7	731220205011	KALAISELVI.K	
8	731220205012	KAVIN.P	
9	731220205013	LENA TAMILVANAN.G	
10	731220205014	MAYILRAJ.V	
11	731220205015	MUTHUKUMAR.G	Mrs.P.Sangeetha AP/IT 9159556470 sangeethap@jkkmct.edu.in
12	731220205016	PANDIYARAJ.C	
13	731220205017	PARVATHY.A	
14	731220205018	PRIYANKA.S	
15	731220205019	RAMKUMAR.R	
16	731220205020	RAVI SANKARAN.N	
17	731220205021	SHIJIN KUMAR.K.G	
18	731220205022	SIVABALAJI.S	
19	731220205023	SRIRAM.V	
20	731220205024	THANGESHWARI.G	
21	731220205301	POORANESHWARAN.N	Mr.R.Sudhakar AP/IT 9884174440 sudha_cse02@yahoo.com
22	731220205302	RAVINDHIRAN.R	
23	731220205303	SHILPA.C	

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Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR: II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
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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	731221205014	KOWSALYA G	Mrs.S.Kanimozhi AP/IT 7904800779 kanmozhis@jkkmct.edu.in
12	731221205015	KRISHNAN S	
13	731221205016	MADHAN KUMAR N	
14	731221205017	MAHADEVAMMA S	
15	731221205019	MANIGANDAN M	
16	731221205020	MANILA K	

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DEPARTMENT OF INFORMATION TECHNOLOGY

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR: II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
17	731221205021	MANOJ KUMAR S	Mrs.S.Kanimozhi AP/IT 7904800779 sweetkani05@gmail.com
18	731221205022	MAVURIYA D	
19	731221205023	MEGALA THANGAMANI M	
20	731221205026	MOTHIR.L	
21	731221205027	MOUNASAKTHI G	Mr.K.Kalaivendhan AP/IT 9600947362 kalaivendhan@jkkmct.edu.in
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	SHARAN KUMAR M V	Mr.R.Sudhakar AP/IT 9884174440 sudha_cse02@yahoo.com
32	731221205038	SIDDAPPA.S	

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Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR: II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
33	731221205039	SUNDHARESWARI V	Mr.R.Sudhakar AP/IT 9884174440 sudha_cse02@yahoo.com
34	731221205040	SUYAMBURAJ C	
35	731221205041	SWETHA S	
36	731221205042	TAMILSELVAN M	
37	731221205043	TAMILSELVI.R	
38	731221205044	YUSWANTHRAA R	
39	731221205301	AHALYA.J.C	

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DEPARTMENTOFSCIENCEANDHUMANITIES

I-IT

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR:I**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731222205001	AKASH.K	Mr.P.Ramesh AP/S&H 9750036658 rameshp@jkkmct.edu.in
2	731222205002	BENISHA.S	
3	731222205003	BHARATH.R	
4	731222205004	BOOPATHIRAJA.N	
5	731222205005	DHANUSH.B	
6	731222205006	DHIVAGAR.C	
7	731222205007	DINESH.S	
8	731222205008	DINESHKUMAR.R	
9	731222205009	ELAVARASAN.V	
10	731222205010	GNANAVELM	
11	731222205011	GOKULAKANNAN.J	Ms.S.Samyuktha AP/S&H 8940299325 samyukthas@jkkmct.edu.in
12	731222205012	GOMATHI.R	
13	731222205013	GUGAVARSHINI.G	
14	731222205014	GUNA.V	
15	731222205015	HARIHARAN.V	
16	731222205016	JEEVADHARSHINI.S	

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17	731222205018	KANISHKA .C	
18	731222205018	KAVIKARTHIKV	
19	731222205019	KAVIYA.S	
20	731222205020	LAKSHMI.M	
21	731222205021	MADHAN.T	Mr.S.Anbuthangam AP/S&H 9789559933 anbuthangams@jkkmct.edu.in
22	731222205022	MADHAVAN.P	
23	731222205023	MAGEESHA.N	
24	731222205024	NAVIN.K	
25	731222205025	PAVITHRAK.M	
26	731222205026	PRAKASH.S	
27	731222205027	PREAMKUMAR.S	
28	731222205028	PUSHPARAJAN.M	
29	731222205029	RADHIGA.S	
30	731222205030	RAGUL.P	
31	731222205031	RAJAVIYASHANA.P	Mr.S.Premkumar AP/S&H 9994600828 premkumarp@jkkmct.edu.in
32	731222205032	RAKSHANAESABELR	
33	731222205033	REENA.S	
34	731222205034	RUHANRAM.S	
35	731222205035	SANJANA.T	

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36	731222205036	SANJAY.M.	
37	731222205037	SANTHAMANOJ.P.N	
38	731222205038	SELVAM.R	
39	731222205039	SIDDARAJ.A	
40	731222205040	SIDDARAJ.K.M	
41	731222205041	STALIN.M	Mr.G.Tamilselvan AP/S&H 9597363115 tamilselvang@jkkmct.edu.in
42	731222205042	SUJITH.P	
43	731222205043	UDHAYAKUMAR.S	
44	731222205044	VANMATHI.S	
45	731222205045	VASANTHKUMAR.H	
46	731222205046	VASUMATHI.K	
47	731222205047	VIGNESH.S	
48	731222205048	VIGNESHVARAN.M	
49	731222205049	VISALATCHI.M	
50	731222205050	VISHNUSANKAR.B	

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DEPARTMENTOFMANAGEMENTSTUDIES

Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1.	731221631001	ABDUL FASIL V.A	M|r.R.Prasanth AP/MBA 7094054451 prasanthr@jkkmct.edu.in
2.	731221631003	ARULRAJ.L	
3.	731221631005	CITHESWARAN.M	
4.	731221631006	DEVIGA.D	
5.	731221631007	DINESH.D	
6.	731221631009	GANAPATHI.G	
7.	731221631013	JIJI JOSEPH	
8.	731221631015	KARTHICK RAJA.S	
9.	731221631016	KEERTHIGA.R	
10.	731221631017	LOGESHWARAN.G	
11.	731221631021	MANOJ KUMAR.G	Mr.G.Alagar AP/MBA 7598614661 alagargaps@gmail.com
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13.	731221631026	NISHANTH.B	
14.	731221631027	NISHANTHINI.P	
15.	731221631028	NIVETHAA. S.R	
16.	731221631029	PAZHANI.A	

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17.	731221631030	PRABHUDEVA.K	
18.	731221631032	PRAVEEN.T	
19.	731221631033	PRIYA.P	
20.	731221631034	RAMYA.M	
21.	731221631036	REVATHI.S	Mr.C.Somasundaram. AP/MBA 9942427252 c.somasundrammba@gmail.com
22.	731221631038	SABITHA.J	
23.	731221631039	SAM SANKAR.M	
24.	731221631040	SANJAYKUMAR.G	
25.	731221631042	SARANYA.A	
26.	731221631043	SARANYA.S	
27.	731221631044	SASIKUMAR.C	
28.	731221631045	SATHISHKUMAR.D	
29.	731221631046	SELVAGANAPATHI.S	
30.	731221631047	SHEEBA CATHERINE.J.L	
31.	731221631048	SINDHU.M	Mr.B.Sivakumar AP/MBA 9629759507 sivakumarb@jkkmct.edu.in
32.	731221631049	SISIRA.S	
33.	731221631050	SIVARANJANI.S	
34.	731221631051	SIVENDRAN.M	
35.	731221631052	SUMAN.L	

36.	731221631055	VANAJA.R	Mr.B.Sivakumar AP/MBA 9629759507 sivakumarb@jkkmct.edu.in
37.	731221631056	VIGNESWARAN.J	
38.	731221631058	VIMALRAJ.A	
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DEPARTMENT OF MANAGEMENT STUDIES

Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: I**

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1	731222631001	ARTHI.M	Mr.K.Avinash AP/MBA 7094054451 avinashk@jkkmct.edu.in
2	731222631002	ASHWINI.S	
3	731222631003	BHARATHI .A	
4	731222631004	BHUVANESWARI. R	
5	731222631005	DHARANI .R	
6	731222631006	DIVYA.S	
7	731222631007	HARIDHARANI.N	
8	731222631008	INDRA.S	
9	731222631009	KALAPSAMUVEL. M	
10	731222631010	MANIMARAN .M	
11	731222631011	MAYA. K	Mr.G.Alagar AP/MBA 7598614661 alagargaps@gmail.com
12	731222631012	NANDHA KISHORE .S	
13	731222631013	NAVEENKUMAR .R	
14	731222631014	NISHANTH	
15	731222631015	PANNEERSELVAM.T	
16	731222631016	PRADEEP .B	

17	731222631017	PRAKASH.S	
18	731222631018	PRASILA.R	
19	731222631019	PRAVEENA. R	
20	731222631020	RAJKUMAR.V	
21	731222631021	RITHIGA.P	Mr.E.R.Vadivel HOD/MBA 9345379991 hodmba@jkkmct.edu.in
22	731222631022	SANTHIYA. P	
23	731222631023	SANTHOSH. S	
24	731222631024	SATHIYAABIRAMI.N	
25	731222631025	SATHIYA PRIYA. G	
26	731222631026	SOWNDARYA.S	
27	731222631027	SRIRAM.M	
28	731222631028	STENIN MESHAK.S.I	
29	731222631029	THILAGAVATHI.P	
30	731222631030	THIYAGU.M	
31	731222631031	VIJAY. R	

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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

Circular–Mentor and Mentee List

ACADEMIC YEAR2022-2023 **YEAR:II**

S.No	RegisterNumber	NameoftheStudent	Name of the Mentee/Mentor
1	731221622005	MONISHA.S	Mrs.P.Archana AP/MCA 8610536046 archanapaneer@gmail.com
2	731221622007	PERINBARAJ.S	
3	731221622008	PRADEESHKUMAR.N	
4	731221622009	SOWMIYA.R	

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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

Circular–Mentor and Mentee List

ACADEMIC YEAR 2022-2023 **YEAR: I**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731222622001	DURGA.K	Mrs.P.Archana AP/MCA 8610536046 archanapaneer@gmail.com
2	731222622003	INIYAA	
3	731222622005	JOSNA	
4	731222622006	LOGANATHAN.A	
5	731222622007	PRAKASH.A	
6	731222622008	RAMAMOORTHI.R	
7	731222622009	RAVIKUMAR.K	
8	731222622011	SURYA.K	

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

M.E-APPLIEDELECTRONICS

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR :II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731221401001	DIVYA R	Mr.P.Dhakshinamoorthi AP/ECE 9894218587 moorthikpm@yahoo.com
2	731221401002	SEETHASUGANTHI S	
3	731221401004	SUDEEP J	

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

M.E-APPLIEDELECTRONICS

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR: I**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731222401001	BAKYALAKSHMI P	Mr.P.Dhakshinamoorthi AP/ECE 9894218587 moorthikpm@yahoo.com
2	731222401002	DEEPIKA M	

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DEPARTMENT OF ELECTRICAL AND ELECTRONICSENGINEERING

M.E-POWER ELECTRONICS AND DRIVES

Circular–MentorandMenteeList

ACADEMICYEAR2022-2023 **YEAR:II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731221415001	DEIVAMANI P	Mr.T.S.Thambiran AP/EEE 9965583599 tsthambi77@gmail.com
2	731221415003	MANIMEGALAI P	

HOD/EEE

Head of the Department,
Department of EEE,
J.K.K.Munirajah College of Technology,
T.N.Palayam-638506.

PRINCIPAL

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

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

M.E-POWER ELECTRONICSAND DRIVES

Circular–MentorandMenteeList

ACADEMIC YEAR 2022-2023 **YEAR: I**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731222415001	PREJITHA S	Mr.T.S.Thambiran AP/EEE 9965583599 tsthambi77@gmail.com
2	731222415002	ROOPAN DURAI G	

HOD/EEE

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DEPARTMENT OF MECHANICAL ENGINEERING

M.E-MANUFACTURING ENGINEERING

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR:II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731221410001	DEEPA S	Mr.M.Thiyakarajan AP/MECH 9566385450 hodmech@jkkmct.edu.in
2	731221410002	DENNIS MATHEW	
3	731221410003	DHARMADURAI T	
4	731221410004	GOWTHAM V	
5	731221410005	GURU PRABHU K	
6	731221410006	JENITH CHRISTOBER J	
7	731221410007	PERIYASAMY N	
8	731221410008	SIVASANKAR A	
9	731221410008	SIVASANKAR A	
10	731221410009	VINOTH.A	

HOD/MECH

HEAD OF THE DEPARTMENT
Department of Mechanical Engineering,
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PRINCIPAL

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DEPARTMENT OF MECHANICALENGINEERING

M.E-MANUFACTURING ENGINEERING

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR: I**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731222410001	JAGADEESH M	Dr.N.Sankar ASP/MECH 9566385450 sankarn@jkkmct.edu.in
2	731222410002	MITTU S THAMPI	
3	731222410003	MUKILAN.S	
4	731222410004	TAMARAISELVAN.S	

HOD/MECH
HEAD OF THE DEPARTMENT
Department of Mechanical Engineering,
J.K.K.Munirajah College of the Technology,
T.N.Palayam, Gobi.

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GOBI (Tk), ERODE (Dt).

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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

M.E-COMPUTER SCIENCE AND ENGINEERING

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR:II**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731221405001	ARUNKUMAR R	Mr.S.Dharanitharan AP/CSE 900347790 dharani.855@gmai.com
2	731221405002	CHARLY S	
3	731221405003	DEEA.G	
4	731221405005	GAYATHRI S	
5	731221405006	INDHIRAN R	
6	731221405007	LOGARAJA S	
7	731221405008	NAVEEN S	
8	731221405009	PONMANI A	
9	731221405010	RAJESH KUMAR A	
10	731221405011	RANJANI R	
11	731221405014	SURESHKUMAR P	

HOD/CSE

Head of the Department,
Department of CSE,
J.K.K. Munirajah College of Technology.
T.N. Palayam - 638506.

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GOBI (Tk), ERODE (Dt).

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Accreditedby NAAC with"A"Grade

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

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

M.E-COMPUTER SCIENCE AND ENGINEERING

Circular–Mentor and Mentee List

ACADEMICYEAR 2022-2023 **YEAR: I**

S.No	Register Number	Name of the Student	Name of the Mentee/Mentor
1	731222405001	KIRUTHIKA S	Mrs.V.Nirosha AP/CSE 6383860677 niroshcse@gmail.com
2	731222405002	THAMARAISELVI R	

HOD/CSE

Head of the Department,
Department of CSE,
J.K.K. Munirajah College of Technology
T.N. Palayam-638 506.

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GOBI (Tk), ERODE (Dt).

J K K MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N PALAYAM, GOBI – 638 506

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROCTOR DIARY & STUDENT PORTFOLIO

1. Student Name : MOUSIKA .S
2. Roll No : 15
3. University Register No. : 7 3 1 2 2 1 1 0 4 0 2 5
4. Course : BE
5. Department : COMPUTER SCIENCE AND ENGINEERING
6. Course duration : 2021-2025
7. Date of Birth(DD/MM/YEAR) : 06-03-2004
8. Religion : HINDU
9. Caste name : PADAYACHI
10. Community : (BC/MBC/OC/OBC/SC/ST/SCA) : MBC
11. E-mail ID : mousikacse@gmail.com
12. Mobile NO : 9344185058
13. Student's signature : S. Mou.
14. Name of the mentor : Mrs. M.C. SAVITHRI ASP/CSE,

UNIVERSITY EXAMINATION MARKS

S.no	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year passing
THEORY								
1	MA3354	Discrete Mathematics	95		B+	2022		Nov/Dec 2022
2	CS3351	Digital Principles and Computer Organization	82		A	2022		Nov/Dec 2022
3	CS3352	Foundations of Data Science	91		B+	2022		Nov/Dec 2022
4	CS3301	Data Structures	86		A	2022		Nov/Dec 2022
5	CS3391	Object Oriented Programming	80		A+	2022		Nov/Dec 2022
PRACTICALS								
1	CS3311	Data Structures Laboratory	96		O	2022		Nov/Dec 2022
2	CS3381	Object Oriented Programming Laboratory	97		O	2022		Nov/Dec 2022
3	CS3361	Data Science Laboratory	98		O	2022		Nov/Dec 2022

Percentage of marks in 3 semester: 86%

Percentage of marks up to 3 semester: 82%

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	–	–
ARREARS CLEARED IN THIS SEMESTER	–	–
ARREARS YET TO BE CLEARED	–	–

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
03/09/22	General Instructions Given	P. Sf.
30/09/22	Important Question Banks Given	S. Nuf.
08/10/22	To Improve Communication skills	S. Nuf.
27/10/22	Improve Writting Practice	S. Nuf.
15/11/22	Provide Information about Internships	S. Nuf.
05/12/22	Tips to Prepare for University Exam	S. Nuf.
21/12/22	offer suggestions for effective study Techniques	S. Nuf.

DETAILS OF INTERACTION WITH PARENTS

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
05/09/22	Pshanmugam	General visit & student Performance	P. Shan
16/11/22	p. shanmugam	Discuss about Internal Marks	P. Shan
8/12/22	p. shanmugam	Discuss about Exam Result	P. Shan.

SIGNATURE OF PROCTOR

SIGNATURE OF
HOD/ACADEMIC HEAD

UNIVERSITY EXAMINATION MARKS

S.No	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year of passing
THEORY								
1	CS3452	Theory of Computation	94		B+	2023		APR/MAY 2023
2	CS3491	Artificial Intelligence and Machine Learning	91		A+	2023		APR/MAY 2023
3	CS3492	Database Management Systems	94		A	2023		APR/MAY 2023
4	CS3401	Algorithms	89		A+	2023		APR/MAY 2023
5	CS3451	Introduction to Operating Systems	79		B+	2023		APR/MAY 2023
6	GE3451	Environmental Sciences and Sustainability	99		B+	2023		APR/MAY 2023
PRACTICALS								
1	CS3461	Operating Systems Laboratory	98		O	2023		APR/MAY 2023
2	CS3481	Database Management Systems Laboratory	99		O	2023		APR/MAY 2023

Percentage of marks in 4 semester: 85%.

Percentage of marks up to 4 semester: 88%.

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	-	-
ARREARS CLEARED IN THIS SEMESTER	-	-
ARREARS YET TO BE CLEARED	-	-

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
10/02/23	Amplify your Academic skills.	S. Mvj.
03/03/23	Improve your Common Skills.	S. Mvj.
30/03/23	Be Socialised with Peer group.	S. Mvj.
06/04/23	Improve writting Practice	S. Mvj.
27/04/23	General Instructions Given	S. Mvj.
11/05/23	Important Question Banks Given	S. Mvj.
	Tips to Prepare for University Exam	S. Mvj.

DETAILS OF INTERACTION WITH PARENTS:

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
17/02/23	P.Shanmugam	General visit	P. Shan
30/03/23	P. Shanmugam	Dissuss about Exam Results	P. Shan

SIGNATURE OF PROCTOR

SIGNATURE OF
HOD/ACADEMIC HEAD

J K K MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N PALAYAM, GOBI – 638 506

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROCTOR DIARY & STUDENT PORTFOLIO

1. Student Name : RANYA. S
2. Roll No : 15
3. University Register No. : 7 3 1 2 2 0 1 0 4 0 2 1
4. Course : B.E
5. Department : COMPUTER SCIENCE AND ENGINEERING
6. Course duration : 2020 - 2024
7. Date of Birth(DD/MM/YEAR) : 20 / 03 / 2003
8. Religion : HINDU
9. Caste name : VANNIYAR
10. Community : (BC/MBC/OC/OBC/SC/ST/SCA) : MBC
11. E-mail ID : ranyas101982@gmail.com
12. Mobile NO : 9566749137
13. Student's signature : S. Rya
14. Name of the mentor : Dr. S. B. Manojkumaar.

UNIVERSITY EXAMINATION MARKS

S.no	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Yea passi
THEORY								
1	MA8551	Algebra and Number Theory	72		U			
2	CS8591	Computer Networks	56		B	2022		Nov/Dec 2022
3	EC8691	Microprocessors and Microcontrollers	55		U			
4	CS8501	Theory of Computation	70		A	2022		Nov/Dec 2022
5	CS8592	Object Oriented Analysis and Design	67		B	2022		Nov/Dec 2022
6	OMD553	Tele Health Technology	59		B	2022		Nov/Dec 2022
PRACTICALS								
1	EC8681	Microprocessors and Microcontrollers Laboratory	95		O	2022		Nov/Dec 2022
2	CS8581	Networks Laboratory	96		O	2022		Nov/Dec 2022
2	CS8582	Object Oriented Analysis and Design Laboratory	95		O	2022		Nov/Dec 2022

Percentage of marks in 5 **semester:** 74 %.

Percentage of marks up to 5 **semester:** 75 %.

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	–	–
ARREARS CLEARED IN THIS SEMESTER	–	–
ARREARS YET TO BE CLEARED	2	MA8551, EC8691

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
17/08/22	common instructions are given	S. Riya.
05/09/22	Advised to attend regular classes	S. Riya.
30/09/22	To improve communica-tions skills	S. Riya.
14/10/22	Concentrate more in mathematics papers	S. Riya.
31/10/22	Give Question Bank for two marks	S. Riya
18/11/22	Discussed about important 16M questions	S. Riya.
6/12/22	Tips to improve grive-ness in theory	S. Riya.

DETAILS OF INTERACTION WITH PARENTS

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
30/08/22	J. Sivakumar	Discuss about Internal performance	S. சிவகுமார்
31/10/22	J. Sivakumar	General visit to college	S. சிவகுமார்

SIGNATURE OF PROCTOR

SIGNATURE OF
HOD/ACADEMIC HEAD

UNIVERSITY EXAMINATION MARKS

S.No	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year of passing
THEORY								
1	CS8651	Internet Programming	65		B	2023		Apr\May 2023
2	CS8691	Artificial Intelligence	61		U.			
3	CS8601	Mobile Computing	69		B	2023		Apr/May 2023
4	CS8602	Compiler Design	71		B+	2023		Apr/May 2023
5	CS8603	Distributed Systems	67		B	2023		Apr/May 2023
PRACTICALS								
1	CS8661	Internet Programming Laboratory	90		O	2023		Apr\May 2023
2	CS8662	Mobile Application Development Laboratory	91		O	2023		Apr\May 2023
3	CS8611	Mini Project	92		O	2023		Apr\May 2023
4	HS8581	Professional Communication	90		O	2023		Apr\May 2023

Percentage of marks in 6 **semester:** 76%

Percentage of marks up to 6 **semester:** 75%

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	2	MA8551 EC8691
ARREARS CLEARED IN THIS SEMESTER	–	–
ARREARS YET TO BE CLEARED	3	MA8551, EC8691 CS8691

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
06/02/23	Common Instructions given	S. Pr.
28/02/23	Try to Improve communication skill	S. Pr.
11/03/23	To concentrate more in mathematics papers	S. Pr.
31/03/23	Tips to Improve giveness in theory	S. Pr.
15/04/23	Advised to learn important tensos	S. Pr.
27/04/23	Give question bank for the 8Marks	S. Pr.
26/05/23	Discussed about Imporrnant questions	S. Pr.

DETAILS OF INTERACTION WITH PARENTS

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
29/03/23	J. Sivakumar	Discussedrabout Internal performance	S. வசந்தி
19/05/23	J. Sivakumar	General visit to college	S. வசந்தி

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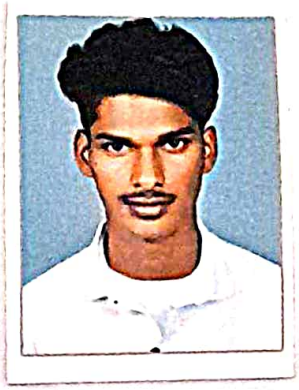
J K K MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N PALAYAM, GOBI – 638 506

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROCTOR DIARY & STUDENT PORTFOLIO



1. Student Name : BAMBAVASAN.V
2. Roll No : 04
3. University Register No. : 7 3 1 2 2 1 1 0 4 0 0 7
4. Course : B.E
5. Department : Computer Science and Engineering
6. Course duration : 2021-2025
7. Date of Birth(DD/MM/YEAR) : 14.10.2003
8. Religion : HINDU
9. Caste name : AADHI DRAVIDAR
10. Community : (BC/MBC/OC/OBC/SC/ST/SCA) : SC
11. E-mail ID : vsstonystony@gmail.com
12. Mobile NO : 6374101420
13. Student's signature : V. Bambavasan
14. Name of the mentor : Mr. E. Ananth, AP/CSE,

UNIVERSITY EXAMINATION MARKS

S.no	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Ye pas
THEORY								
1	MA3354	Discrete Mathematics	92		U			
2	CS3351	Digital Principles and Computer Organization	79		B+	2022		Nov/Dec 2022
3	CS3352	Foundations of Data Science	80		A	2022		Nov/Dec 2022
4	CS3301	Data Structures	79		A	2022		Nov/Dec 2022
5	CS3391	Object Oriented Programming	76		B	2022		Nov/Dec 2022
PRACTICALS								
1	CS3311	Data Structures Laboratory	89		O	2022		Nov/Dec 2022
2	CS3381	Object Oriented Programming Laboratory	90		O	2022		Nov/Dec 2022
3	CS3361	Data Science Laboratory	95		O	2022		Nov/Dec 2022

Percentage of marks in 3 semester: 79%

Percentage of marks up to 3 semester: 75%

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	1	GE3351
ARREARS CLEARED IN THIS SEMESTER	1	GE3351
ARREARS YET TO BE CLEARED	–	–

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
03/09/22	General Instructions Given	V. Banavasy
30/09/22	Important Question banks given	V. Banavasy
08/10/22	To Improve Communication Skills	V. Banavasy
27/10/22	Improve Writing practice	V. Banavasy
15/11/22	Provide Information about Internships	V. Banavasy
5/12/22	Tips to prepare for university Exam	V. Banavasy
21/12/22	Offer Suggestions for effective study Techniques	V. Banavasy

DETAILS OF INTERACTION WITH PARENTS

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
5/09/22	S. VENUGOPAL	General visit & student performance	
16/11/22	S. VENUGOPAL	Discuss about Internal Marks	
8/12/22	S. VENUGOPAL	Discuss about Exam Result	

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UNIVERSITY EXAMINATION MARKS

S.No	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year of passing
THEORY								
1	CS3452	Theory of Computation	83		B	2023		APR/MAY 2023
2	CS3491	Artificial Intelligence and Machine Learning	90		A	2023		APR/MAY 2023
3	CS3492	Database Management Systems	86		A	2023		APR/MAY 2023
4	CS3401	Algorithms	62		A	2023		APR/MAY 2023
5	CS3451	Introduction to Operating Systems	78		B+	2023		APR/MAY 2023
6	GE3451	Environmental Sciences and Sustainability	98		B+	2023		APR/MAY 2023
PRACTICALS								
1	CS3461	Operating Systems Laboratory	92		O	2023		APR/MAY 2023
2	CS3481	Database Management Systems Laboratory	93		O	2023		APR/MAY 2023

Percentage of marks in 4 semester: 79%.

Percentage of marks up to 4 semester: 76%.

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	1	MA3354
ARREARS CLEARED IN THIS SEMESTER	1	MA3354
ARREARS YET TO BE CLEARED	-	-

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
10/02/23	Amplify your Academic skills.	V. Bantawaray
03/03/23	Improve your Common skills.	V. Bantawaray
30/03/23	Be Socialised with Peer group.	V. Bantawaray
06/04/23	Improve Writting Practice.	V. Bantawaray
27/04/23	General Instructions Given	V. Bantawaray
11/05/23	Important Question Banks Given	V. Bantawaray
	Tips to Prepare for University Exam	V. Bantawaray

DETAILS OF INTERACTION WITH PARENTS:

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
17/02/23	S. VENUGOPAL	General visit	S Venugopal
30/03/23	S VENUGOPAL	Discuss about Exam Results	S Venugopal

SIGNATURE OF PROCTOR

SIGNATURE OF
HOD/ACADEMIC HEAD

J K K MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N PALAYAM, GOBI – 638 506

DEPARTMENT OF INFORMATION TECHNOLOGY

PROCTOR DIARY & STUDENT PORTFOLIO

1. Student Name : PARVATHY. A
2. Roll No : 13
3. University Register No. : 7 3 1 2 2 0 2 0 5 0 1 7
4. Course : B-TECH
5. Department : INFORMATION TECHNOLOGY
6. Course duration : 2020-2024
7. Date of Birth(DD/MM/YEAR) : 29-11-2002
8. Religion : HINDU
9. Caste name : NADAR
10. Community : (BC/MBC/OC/OBC/SC/ST/SCA) : BC
11. E-mail ID : Parvathyponnusamy7598@gmail.com
12. Mobile NO : 9360273684
13. Student's signature : Parvathy A.
14. Name of the mentor : Mrs. R. kavitha AP/IT,

UNIVERSITY EXAMINATION MARKS

S.no	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year of passing
THEORY								
1	MA8551	Algebra and Number Theory	53		B	2022		Nov/Dec 2022
2	CS8591	Computer Networks	59		B	2022		Nov/Dec 2022
3	EC8691	Microprocessors and Microcontrollers	48		B	2022		Nov/Dec 2022
4	IT8501	Web Technology	43		B	2022		Nov/Dec 2022
5	CS8494	Software Engineering	70		B	2022		Nov/Dec 2022
6	OMD553	Tele Health Technology	48		U			
PRACTICALS								
1	EC8681	Microprocessors and Microcontrollers Laboratory	91		O	2022		Nov/Dec 2022
2	CS8581	Networks Laboratory	92		A	2022		Nov/Dec 2022
3	IT8511	Web Technology Laboratory	91		A+	2022		Nov/Dec 2022

Percentage of marks in 5 **semester:** 72 %.

Percentage of marks up to 5 **semester:** 70 %.

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	1	MA8402
ARREARS CLEARED IN THIS SEMESTER	–	–
ARREARS YET TO BE CLEARED	–	–

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
17/08/22	Common Instructions Given	Parvathy A
05/09/22	Try to Improve Communication Skill	Parvathy A
30/09/22	To Concentrate move in Mathematics Papers	Parvathy. A
14/10/22	Tips to improve grivences in theory	Parvathy. A
31/10/22	Advised to learn important tenses	Parvathy A
18/11/22	Give Question Bank for two marks	Parvathy A
06/12/22	Discussed about important 16M Questions	Parvathy A

DETAILS OF INTERACTION WITH PARENTS:

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
30/08/22	AYYAVU. P	Discuss about Internal Performance	AYYAVU
31/10/22	AYYAVU. P	General visit to College	AYYAVU

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SIGNATURE OF
HOD/ACADEMIC HEAD

UNIVERSITY EXAMINATION MARKS:

S.No	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year of passing
THEORY								
1	IT8601	Computational Intelligence	70		B+	2023		APR\MAY 2023
2	CS8592	Object Oriented Analysis and Design	75		B+	2023		APR\MAY 2023
3	IT8602	Mobile Communication	74		B+	2023		APR\MAY 2023
4	CS8091	Big Data Analytics	56		U			
5	CS8092	Computer Graphics and Multimedia	64		B	2023		APR\MAY 2023
PRACTICALS								
1	CS8662	Mobile Application Development Laboratory	92		A+	2023		APR\MAY 2023
2	CS8582	Object Oriented Analysis and Design Laboratory	91		A+	2023		APR\MAY 2023
3	IT8611	Mini Project	93		O	2023		APR\MAY 2023
4	HS8581	Professional Communication	94		O	2023		APR\MAY 2023

Percentage of marks in 6 **semester:** 73.1.

Percentage of marks up to 6 **semester:** 71.7

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	1	OMD553
ARREARS CLEARED IN THIS SEMESTER	-	-
ARREARS YET TO BE CLEARED	-	-

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
06/02/23	Common instructions Given	Parvathy A
28/02/23	Try to improve Communication skill	Parvathy A
11/03/23	TO Concentrate more in mathematics papers	Parvathy. A
31/03/23	Tips to improve Givences in theory	Parvathy. A
15/04/23	Advised to learn important tenses	Parvathy A
27/04/23	Give question bank for two marks	Parvathy A
26/05/23	Discussed about important 16M questions	Parvathy A

DETAILS OF INTERACTION WITH PARENTS

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
29/03/23	AYYAVU.P	Discuss about Internal Performance	AYYAVU
19/05/23	AYYAVU.P	Generael visit to College	AYYAVU

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J K K MUNIRAJAH COLLEGE OF TECHNOLOGY

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DEPARTMENT OF INFORMATION TECHNOLOGY

PROCTOR DIARY & STUDENT PORTFOLIO

1. Student Name : S. SWETHA
2. Roll No : 35
3. University Register No. : 7 3 1 2 2 1 2 0 5 0 4 1
4. Course : B.Tech
5. Department : INFORMATION TECHNOLOGY
6. Course duration : 2021 - 2025
7. Date of Birth(DD/MM/YEAR) : 25 - 08 - 2004
8. Religion : HINDU
9. Caste name : AADHI KARNATAKA
10. Community : (BC/MBC/OC/OBC/SC/ST/SCA) : SC
11. E-mail ID : swethaswetha6763@gmail.com
12. Mobile NO : 9361470761
13. Student's signature : S. Swetha
14. Name of the mentor : Mr. R. Sudhakar, AP/IT,

UNIVERSITY EXAMINATION MARKS

S.no	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year of passing
THEORY								
1	MA3354	Discrete Mathematics	79		B+	2022		Nov/Dec 2022
2	CS3351	Digital Principles and Computer Organization	66		A	2022		Nov/Dec 2022
3	CS3352	Foundations of Data Science	62		B+	2022		Nov/Dec 2022
4	CS3301	Data Structures	58		B+	2022		Nov/Dec 2022
5	CS3391	Object Oriented Programming	50		B	2022		Nov/Dec 2022
PRACTICALS								
1	CS3311	Data Structures Laboratory	96		O	Nov/Dec 2022		Nov/Dec 2022
2	CS3381	Object Oriented Programming Laboratory	98		O	Nov/Dec 2022		Nov/Dec 2022
3	CS3361	Data Science Laboratory	97		O	Nov/Dec 2022		Nov/Dec 2022

Percentage of marks in 3 **semester:** 75 %.

Percentage of marks up to 3 **semester:** 76 %.

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	—	—
ARREARS CLEARED IN THIS SEMESTER	—	—
ARREARS YET TO BE CLEARED	—	—

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
27/8/22	General Instruction Given	S. Swetha
12/9/22	Suggest to create a study schedule	S. Swetha
7/10/22	Provide guidance on effective study techniques	S. Swetha
31/10/22	Suggest to use online materials	S. Swetha
4/11/22	Important Question Given	S. Swetha
29/11/22	Question Bank Given	S. Swetha
	—	

DETAILS OF INTERACTION WITH PARENTS

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
13/09/22	SIVAKUMAR	General visit	Sivakumar
17/10/22	SIVAKUMAR	Discuss about Internal marks	Sivakumar
26/11/22	SIVAKUMAR	Discuss about Exam Results	Sivakumar

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SIGNATURE OF
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UNIVERSITY EXAMINATION MARKS:

S.No	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year of passing
THEORY								
1	CS3452	Theory of Computation	81		B+	2023		April/May 2023
2	CS3491	Artificial Intelligence and Machine Learning	66		B+	2023		April/May 2023
3	CS3492	Database Management Systems	87		B+	2023		April/May 2023
4	IT3401	Web Essentials	54		A	2023		April/May 2023
5	CS3451	Introduction to Operating Systems	61		B+	2023		April/May 2023
6	GE3451	Environmental Sciences and Sustainability	86		B+	2023		April/May 2023
PRACTICALS								
1	CS3461	Operating Systems Laboratory	99		O	April/May 2023		April/May 2023
2	CS3481	Database Management Systems Laboratory	97		O	April/May 2023		April/May 2023

Percentage of marks in 4 semester: 78 %.

Percentage of marks up to 4 semester: 79.1 %.

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	—	—
ARREARS CLEARED IN THIS SEMESTER	—	—
ARREARS YET TO BE CLEARED	—	—

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
10/02/23	General Instruction Given	S.Swetha
04/03/23	Encourage students to clear their achievement	S.Swetha
29/03/23	Tips to concentrate on studies	S.Swetha
17/04/23	Provide guidance on effective study technique	S.Swetha
03/05/23	Give the important university Question	S.Swetha
20/05/23	Remind students to maintain focus on study	S.Swetha
	—	

DETAILS OF INTERACTION WITH PARENTS:

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
17/02/23	SIVAKUMAR	General visit	Sivakumar
30/03/23	SIVAKUMAR	Discuss about Exam Results	Sivakumar

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DEPARTMENT OF INFORMATION TECHNOLOGY

PROCTOR DIARY & STUDENT PORTFOLIO

1. **Student Name** : T.PRIYADHARSINI
2. **Roll No** : 08
3. **University Register No.** : 731219205011
4. **Course** : B.TECH
5. **Department** : Information Technology
6. **Course duration** : 2019-2023
7. **Date of Birth(DD/MM/YEAR)** : 07-01-2003
8. **Religion** : HINDU
9. **Caste name** : THOTTIYANAICKAR
10. **Community** : (BC/MBC/OC/OBC/SC/ST/SCA) : BC
11. **E-mail ID** : priyadharsini8523@gmail.com
12. **Mobile NO** : 9095156313
13. **Student's signature** : T. Priya
14. **Name of the mentor** : Mr. A. Sampathkumar AP/IT,

UNIVERSITY EXAMINATION MARKS

S.no	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year o. passing
THEORY								
1	MG8591	Principles of Management	85		A	2022		Nov/Dec 2022
2	CS8792	Cryptography and Network Security	82		A	2022		Nov/Dec 2022
3	CS8791	Cloud Computing	88		B+	2022		Nov/Dec 2022
4	OME752	Supply Chain Management	85		A+	2022		Nov/Dec 2022
5	IT8074	Service Oriented Architecture	87		A	2022		Nov/Dec 2022
6								
PRACTICALS								
1	IT8711	Foss &Cloud Computing Laboratory	98		O	2022		Nov/Dec 2022
2	IT8761	Security Laboratory	97		O	2022		Nov/Dec 2022

Percentage of marks in 7 **semester:** 79%.

Percentage of marks up to 7 **semester:** 82%.

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	—	—
ARREARS CLEARED IN THIS SEMESTER	—	—
ARREARS YET TO BE CLEARED	—	—

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
18/08/22	Amplify your Academic Skills.	T. Pri
07/09/22	Improve your Common Skills	T. Pri
31/09/22	Be Socialised with Peer groups.	T. Pri
13/10/22	Improve writting Practice	T. Pri
31/10/22	General Instructions Given	T. Pri
12/11/22	Important Question Banks Given	T. Pri
30/11/22	General Instructions Given	T. Pri

DETAILS OF INTERACTION WITH PARENTS

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
23/08/22	THAVASIYAPPAN	Discuss about internal Performance	
28/09/22	THAVASIYAPPAN	General visit to collegl	
22/11/22	THAVASIYAPPAN	Discuss about university exam	

E. Arun.

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UNIVERSITY EXAMINATION MARKS

S.No	Subject code	Name of the Subjects	Internal (100)	External	Total marks	Year of passing	Total marks	Year of passing
THEORY								
1	GE8076	Professional Ethics in Engineering	89		A+	2023		APR/MAY 2023
2	CS8078	Green Computing	98		A	2023		APR/MAY 2023
PRACTICALS								
1	IT8811	Project Work	98		O	2023		APR/MAY 2023

Percentage of marks in 8 **semester:** 90%.

Percentage of marks up to 8 **semester:** 88%.

ARREAR DETAILS (IF ANY):

DETAILS	NUMBERS	SUBJECT CODES
TOTAL ARREARS TILL LAST SEMESTER	—	—
ARREARS CLEARED IN THIS SEMESTER	—	—
ARREARS YET TO BE CLEARED	—	—

COUNSELING INFORMATION
(TO BE FILLED BY PROCTOR)

DATE	PARTICULARS	STUDENT'S SIGNATURE
14/02/23	Important Question Banks Given	T. Pro
04/03/23	General Instructions Given	T. Pro
31/03/23	To Improve Communication Skills.	T. Pro
03/04/23	Improve writting Practice	T. Pro
28/04/23	Provide Information about Internships.	T. Pro
02/05/23	Tips to Prepare for Univecsity Exam.	T. Pro
10/05/23	Offer Suggestions for effective Techniques.	T. Pro

DETAILS OF INTERACTION WITH PARENTS

DATE	PARENT NAME	INTERACTION DETAILS	PARENT'S SIGNATURE
16/02/23	THAVASIYAPPAN	Disscuss about internal Performance	
24/03/23	THAVASIYAPPAN	General Visit to college	
28/04/23	THAVASIYAPPAN	Disscuss about univerisity exam	

E. Arun

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INDEX

S.NO	CONTENTS	PAGE NO.
1	Mentor issues action taken form	I
Evidence(Samples)		
2	BE-AUTO	1
	BE-CSE	23
	BE-CIVIL	43
	BE-MECH	47
	BE-ECE	60
	B.Tech-IT	78
	SCIENCE&HUMANITIES	80

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MENTOR ISSUES DISCUSSUED AND ACTION TAKEN FORM

S.NO	MENTOR NAME	STUDENT NAME	STUDENT QURIES	ACTION TAKEN	REMARKS
1	Mr.P.ESWARAN ,AP/AUTO	P.KAVIN II-AUTO	Need subject important questions for AU3301-Thermodynamics and Heat Transfer	Printed copy of subject important questions are provided for the student	Resolved
		B.RAJKUMAR II-AUTO	He asked soft copy of subject notes for ME8351, Manufacturing Technology - I	Soft copy of subject notes is provided for the student	Action to taken
2	Mr.E.ANANTH,AP/CSE	P.GUNASEKARAN II-CSE	He asked Questions Bank for CS3491-Theory of computation subject.	Soft copy of subject important questions are provided for the student.	Action taken
3	Mr.K.S.VINOTHAN,,AP/CSE	S.NIRMALRAJ III-CSE	Need important 2 marks and PART B questions for CS8691-Artificial intelligence subject	Soft copy of important 2 marks is provided to thestudent	Resolved

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S.NO	MENTOR NAME	STUDENT NAME	STUDENT QURIES	ACTION TAKEN	REMARKS
4	Mrs.P.REENA, AP/CIVIL	S.SUSITHRA II-CIVIL	Requested for co-curricular activities like workshop in the even semester.	Concern programme organizer was asked to arrange the activities. And also co-curricular activities were conducted to enhance their knowledge.	Resolved
		R.DIVAKAR III-CIVIL	Feeling overwhelmed by the volume of assignments.	Student was advised to discuss about it to his concerns with the instructor to explore options, such as workload adjustments or time management strategies. According to that the due date were adjusted.	Resolved
		ANIL KUMAR BALDABOI IV-CIVIL	Problems in accessing the journals of research projects / thesis work.	Students were equipped with necessary E-Gate journals and instructions were provided to download the required thesis by providing usernames and passwords.	Resolved
		DEBACHAND MUDULI IV-CIVIL			

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S.NO	MENTOR NAME	STUDENT NAME	STUDENT QURIES	ACTION TAKEN	REMARKS
5	Mr.K.S.RAMESH, AP/MECH	M.KARTHI III-MECH	Need subject important questions for ME8792 Power Plant Engineering	Printed copy of subject important questions are provided for the student	Resolved
		K.SIVANANTH IV-MECH	He Asked soft copy of subject notes for ME8791 Mechatronics	Soft copy of subject notes is provided for the student.	Action to taken
6	Mr.S.KARTHIKEYAN, AP/MECH	B.RAMESH IV-MECH	Need subject unit vice 2 and 16 Marks for ME8593 Design of Machine Elements	Soft copy of subject unit vice 2 and 16 Marks files is provided for the student	Resolved
		M.PALANIKUMAR III-MECH	Need Previous year university questions soft copy for ME8501 Metrology and Measurements	Soft copy and hard copy of Previous year university questions is provided for the student	Issue Redfield
7	Mrs.B.P.BRIGH THANGA MAHIZH, AP/ECE	K.MOHAN IV-ECE	Need PPT Presentation for EC8094-Satellite Communication subjects	PPT Class for satellite communication provided to the students	Resolved

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S.NO	MENTOR NAME	STUDENT NAME	STUDENT QURIES	ACTION TAKEN	REMARKS
8	Mrs.U.SASIKALA ,AP/ECE	K.KALYAN III-ECE	He asked question bank of EC8095-VLSI Design subject	Question bank of VLSI Design provided to the students	Action to taken
9	Mr.S.PRADEEPAN ,AP/IT	S.GOKUL III-IT	He asked Possible Questions for CS8091-BIG DATA ANALYTICS SUBJECT	Soft copy of possible questions for 5 units provided to theStudent	Action taken
10	Mr.A.SAMBATH KUMAR AP/IT	H.GOWTHAM IV-IT	Need Possible Questions for MG8591-PRINCIPLES OF MANAGEMENT	Soft copy of possible questions for 5 units provided to thestudent	Resolved
11	Mrs.M.SENBAGAM, AP/S&H	D.JAYASREE I-CSE	Need possible questions in PSPP	Soft copy of possible questions for 5 units provided to thestudent	Resolved
		H.SAHEER I-CSE	Need basic concepts for Heritage of tamil	Concepts are given	Action Taken

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S.NO	MENTOR NAME	STUDENT NAME	STUDENT QURIES	ACTION TAKEN	REMARKS
12	Ms.S.SAMYUKTHA ,AP/S&H	P.SUJITH I-IT	Need previous year University question for Matrix and Calculus	Previous year questions are given to him	Resolved
		K.VASUMATHI I-IT	Need important questions for Engineering Physics	Important questions are given	Action taken
13	Mr.P.RAMESH,AP/S&H	R.DHANRAJ I-ECE	Need basic grammars in Professional English	Basic grammars given to him	Resolved
14	Mr.S.PREMKUMAR,AP/S&H	K.RAJESHKUMAR I-MECH	Need previous year University question forPSPP	Previous year question paper are given	Action to taken
		ANANDHAN B I-CIVIL	Need important formulas in Matrix and Calculus	Formulas are given to him	Resolved
		S.SURIYAKUMAR I-MECH	Need important questions for Engineering Chemistry	Important questions are given to him	Action to Taken

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EVIDENCES PROVIDED FOR ACTION TAKEN FOR MENTOR ISSUES

DEPARTMENT OF AUTOMOBILE ENGINEERING

IMPORTANT QUESTIONS AU3301- THERMODYNAMICS & HEAT TRANSFER

UNIT-1

1. Explain the state of equilibrium. Also discuss thermal, chemical and mechanical equilibrium with suitable examples.

2.Explain the different types of systems with neat sketches and suitable examples.

3. Explain Zeroth law of Thermodynamics.

4. Define the temperature. Name the different temperature scales in common use and establish a relation between Celsius and Fahrenheit scale.

5. Write short notes on following:

1) Equality of temperature
2) Law of perfect gases
3) Process and cycle
4) Point Function, Path Function

6. What is pure substance? Draw the phase equilibrium diagram for a pure substance on T-S plot with relevant constant property lines. Q

7. Draw the phase equilibrium diagram for a pure substance on h-s plot with relevant constant Property lines.

8. Pressure of the steam inside a boiler, as measured by pressure gauge, is 2 N/mm2 . The barometric pressure of the atmosphere is 765 mm of mercury. Find the absolute pressure of steam in N/m2 ,kPa, bar and N/mm2 .

9. What is energy? Explain the different types of energy in detail.

UNIT-2

1. Explain First law of thermodynamics. B) Explain and derive Steady Flow Energy Equation.

2. What do you mean by the term ' Property'? Prove that Heat and Work is not a point function.

3. Derive the work done for following process: 1 Isochoric process 2 Isobaric process 3 Isothermal process

4 Adiabatic process 5 Polytrophic process

5. Derive amount of heat transfer for the above processes in previous question.

6. a) Explain Second Law of Thermodynamics.

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b)Prove that violation of Kelvin Plank statement leads to violation of Clausius statement.

7.Explain the difference between heat pump and refrigerator, also find the C.O.P

8.Define the term 'Entropy'. Derive an expression for change of entropy for following process.

1. Isochoric process
2 Isobaric process
3 Isothermal process
4 Adiabatic proce

9.Write short notes on following associated with S.F.E.E.

(i) Nozzle
(ii) Throttle Valve
(iii) Turbine

UNIT-3

1 What do you understand by high grade energy and low grade energy? Deduce the expression or available energy from a finite energy source at temperature T When the environmental temperature is T.

2. Derive Maxwell's equation.

3. Give the Gibbs phase Rule for a non reactive system

4. Explain Joule Kelvin Effect. What is Inversion Temperature?

5. Derive the following expression $TdS=CpdT - T(\partial V/\partial T)p\ dp$

6. Derive an expression for clausiusclapeyron equation.

7. Derive an expression for Joule Thomson coefficient.

8. A mass of 1.5kg and volume of 0.14m3 of certain gas at 40 bar is expended isentropically such that temperature falls to 500 K. Determine

1. Initial temperature of gas
2. Work done during the process
3. Pressure at end of expansion. Take R=0.287 kJ/kgK , and Cv=0.718 kJ/kgK

UNIT-4

1. With the help of p-v and T-s diagram, show that for the same maximum pressure and temperature of the cycle and the same heat rejection, $\eta Diesel > \eta Dual > \eta Otto$

2. Derive an expression for Efficiency in following cycles 1. Stirling Cycle 2.Air Standard Cycle 3.Bryaton Cycle 3. (a) Explain the working of four stroke and two stroke petrol engine with neat diagram. (b) List out the differences between S.I. engine and C.I. engine.

4. Determine the efficiency of diesel engine

5. Derive an expression for pressure ratio, temperature ratio and efficiency for otto cycle.

6. Derive an expression for pressure ratio, temperature ratio and entropy difference for dual cycle.

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7.In an air standard otto cycle, the compression ratio is 7 and the compression begins at 1 bar and 313K. the heat added is 2510 kJ/kg. Find the (1). Maximum temp and pressure of the cycle (2) Work done per kg of air (3) Cycle efficiency and mean effective pressure. Take for air Cv=0.718kJ/kgK and R=287 J/kgK

8.Derive an expression of efficiency of Atkinston cycle. Q9 Two engines are to operate on otto and diesel cycle with the following data: Maximum temperature=1500K; Exhaust temperature=700K; Ambient conditions= 1 bar and 300K Compare the compression ratios and maximum pressures and efficiencies of two engines.

9. An air engine, working on stirling cycle, has lower limit of temperature of 400oC. The maximum and minimum pressure limits are 12 bar and 2 bar. If the expansion ratio of the cycle is 3 then find the ideal efficien

UNIT-5

1. Explain the Rankine cycle with neat diagram.
2. Explain the vapour compression refrigeration cycle with neat diagram.
3. Explain following: (i) Avogadro's Law (ii) Bleeding process (iii) Enthalpy
4. Define Cp& Cv. Derive following expression: Cp-Cv =R
5. A cyclic steam power plant is to be designed for a steam temperature at turbine inlet of 3600C and an exhaust pressure of 0.08bar. After isentropic expansion of steam in the turbine, the moisture content at the turbine exhaust is not to exceed 15%. Determine the greatest allowable steam pressure at he turbine inlet, and calculate the Rankine efficiency.
6. One Kg steam at a pressure of 4 bar and a dryness fraction of 0.963 is compressed isentropically until it is dry saturated. Heat is then supplied at constant pressure until the initial volume is attained and the steam is finally restored to its initial state by constant volume cooling. Evaluate the work and heat transfer in each step and verify that the net work done is equal to the difference between the heat supplied and heat rejected over the cycle
7. In a regenerative cycle, having one feed water heater, the dry saturated steam is supplied from the boiler at a pressure of 30 bar and condenser pressure of 1 bar. The steam is bled at a pressure of 5 bar. Determine the amount of bled steam per kg of steam supplied and the efficiency of the cycle. What would be the efficiency without regenerative feed heating? Also determine the percentage increase in efficiency due to regeneration.
8. (a) Describe regenerative feed heating as use in thermal power plant and its advantages. (b) What is reheat factor? Explain heat with the h-s diagram.
9. A steam power plant uses the following cycle: Steam at boiler outlet—150 bar, 5500C, reheat at 40bar to 5500C, condenser at0.1 bar. Find the quality at turbine exhaust and cycle efficiency.
10. A refrigeration machine using R-12 as refrigerant operates between the pressures 2.5 bar and 9 bar. The compression is isentropic and there is no under cooling in the condenser.

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DEPARTMENT OF AUTOMOBILE ENGINEERING

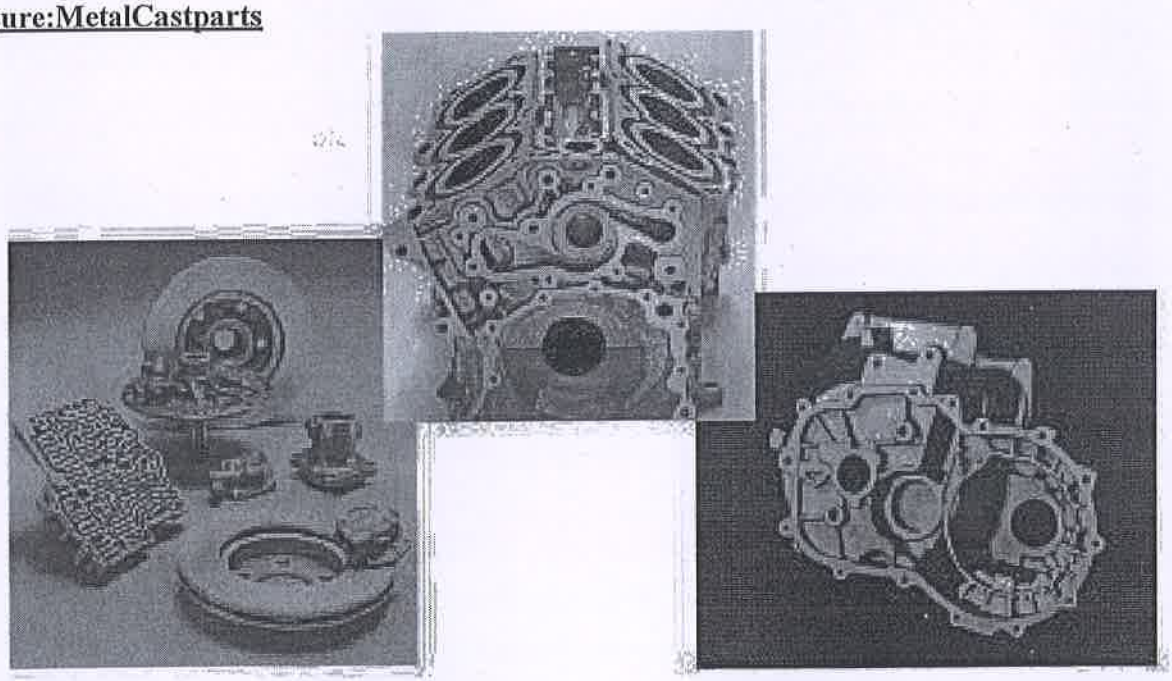
SOFT COPY NOTES-ME8351-MANUFACTURING TECHNOLOGY-I

UNIT I METAL CASTING PROCESSES

Virtually nothing moves, turns, rolls, or flies without the benefit of cast metal products. The metal casting industry plays akey role in all the major sectors of our economy. There are castings in locomotives, cars trucks, aircraft, office buildings,factories,schools, andhomes.Figuresome metalcastparts.

Metal Casting is one of the oldest materials shaping methods known. Casting means pouring molten metal into a moldwithacavityoftheshape tobemade, andallowingittosolidify. Whensolidified,the desiredmetal objectistakenoutfrom the mold either by breaking the mold or taking the mold apart. The solidified object is called the casting. By thisprocess,intricatepartscanbegivenstrengthandrigidityfrequentlynotobtainablebyanyother manufacturing
process.The mold, into which the metal is poured, is made of some heat resisting material. Sand is most often used as itresiststhehightemperatureofthemolten metal.Permanent molds ofmetalcanalsobeused tocast products.

Figure:MetalCastparts



Advantages
Themetal castingprocessisextensivelyusedinmanufacturingbecauseofitsmanyadvantages.

1. Moltenmaterial canflowintoverysmallsectionssothatintricateshapescanbemadebythisprocess.Asaresult,manyoth er operations,suchasmachining, forging,andwelding, canbeminimized or eliminated.
2. It ispossibletocast practicallyanymaterialthat isferrousornon-ferrous.
3. Asthemetalcanbeplacedexactlywhereit isrequired,largesavinginweight canbeachieved.
4. Thenecessarytoolsrequiredforcastingmoldsare verysimpleandinexpensive.Asaresult,for

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productionofasmall lot, itis theidealprocess.

5. Therearecertainpartsmade frommetalsandalloysthatcanonlybeprocessedthis way.

atternAllowances

Pattern allowance is a vital feature as it affects the dimensional characteristics of the casting. Thus, when the pattern isproduced, certain allowances must be given on the sizes specified in the finished component drawing so that a castingwiththeparticular specificationcanbemade.Theselectionofcorrect allowancesgreatlyhelpstoreducemachiningcostsandavoidrejections. Theallowancesusuallyconsidered on patternsandcore boxes areasfollows:

1. Shrinkageorcontractionallowance
2. Draftortaperallowance
3. Machiningorfinishallowance
4. Distortionorcamberallowance
5. Rappingallowance

ShrinkageorContractionAllowance(clickon Table1**toviewvariousrateofcontractionofvariousmaterials)**

Allmost allcast metalsshrinkorcontractvolumetricallyoncooling.Themetalshrinkageisoftwotypes:

i. **Liquid Shrinkage:** it refers to the reduction in volume when the metal changes from liquid state to solid state atthesolidus temperature.Toaccountforthisshrinkage;riser,whichfeedtheliquidmetal tothecasting,are providedinthe mold.

ii. **Solid Shrinkage:** it refers to the reduction in volume caused when metal loses temperature in solid state. Toaccountforthis, shrinkage allowanceisprovided onthe patterns.

The rate of contraction with temperature is dependent on the material. For example steel contracts to a higher degreecompared to aluminum. To compensate the solid shrinkage, a shrink rule must be used in laying out the measurements forthe pattern. A shrink rule for cast iron is 1/8 inch longer per foot than a standard rule. If a gear blank of 4 inch in diameterwas planned to produce out of cast iron, the shrink rule in measuring it 4 inch would actually measure 4 -1/24 inch, thuscompensatingfortheshrinkage. Thevarious rateofcontraction ofvarious materialsare given inTable

Material	Dimension	Shrinkage allowance(inch/ft)
GreyCast Iron	Upto 2feet	0.125
	2feet to4feet	0.105
	over 4feet	0.083
CastSteel	Upto 2feet	0.251
	2feet to6feet	0.191
	over 6feet	0.155
Aluminum	Upto 4feet	0.155
	4feet to6feet	0.143
	over 6feet	0.125
Magnesium	Upto 4feet	0.173
	Over4feet	0.155

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GatingSystem

The assembly of channels which facilitates the molten metal to enter into the mold cavity is called the gating system.. Alternatively, the gating system refers to all passage ways through which molten metal passes to enter into themoldcavity.Thenomenclatureof gatingsystemdependsuponthefunctionofdifferent channels whichtheyperform.

- Downgatesorsprue

Themetal flowsdownfromthepouringbasin orpouringcupintothedown gateorsprueand passesthrough

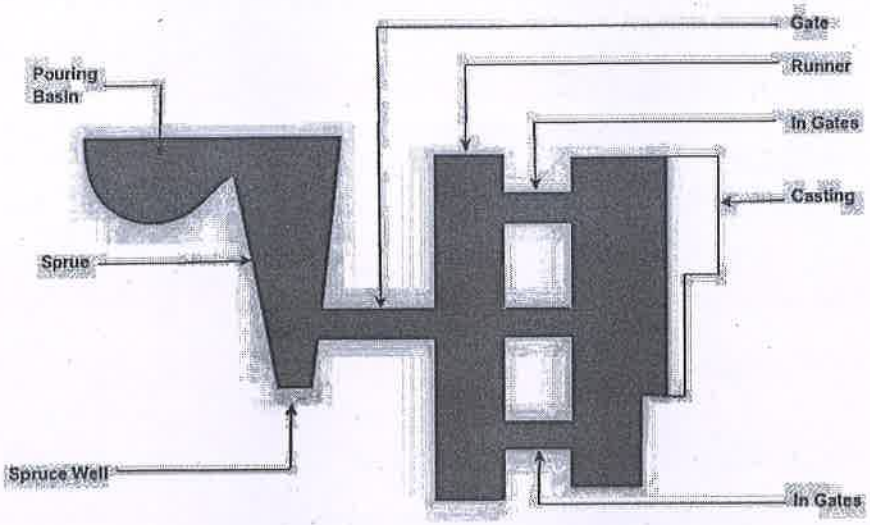

Figure 17: Schematic of Gating System

thecrossgateorchannelsandingates or gates before enteringinto themold cavity.

Classificationof WeldingProcesses:

Weldingprocessescanbeclassifiedbasedonfollowingcriteria;

1. Weldingwithorwithoutfillermaterial.
2. Sourceofenergyof welding.
3. ArcandNon-arcwelding.

FusionandPressurewelding

1. Welding can be carried out with or without the application of filler material. Earlier only gas welding was thefusion process in which joining could be achieved with or without filler material. When welding was donewithoutfillermaterialitwascalled'autogenouswelding'.However,withthedevelopmentofTIG ,electronbeamand other welding processes such classification created confusion as many processes shall be falling in both thecategories.
2. Varioussourcesofenergiesareusedsuchaschemical,electrical,light,sound,mechanicalenergies,but exceptforchemical energyall other formsofenergiesaregenerated fromelectrical energyforwelding.Sothis criteriondoesnotjustifyproper classification.

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3. ArcandNon-arcweldingprocessesclassificationembracesall thearcweldingprocessesinoneclassandallotherprocesses in other class. In such classification it is difficult to assign either of the class to processes such aselectroslag welding and flash butt welding, as in electroslag welding the process starts with arcing and with themelting of sufficient flux the arc

4. extinguishes while in flash butt welding tiny arcs i.e. sparks are establishedduring the process and then components are pressed against each other. Therefore, such classification is also notperfect.

5. Fusion welding and pressure welding is most widely used classification as it covers all processes in both thecategories irrespective of heat source and welding with or without filler material. In fusion welding all thoseprocesses are included where molten metal solidifies freely while in pressure welding molten metal if any isretained in confined space under pressure (as may be in case of resistance spot welding or arc stud welding)solidifiesunderpressureorsemisolidmetalcoolsunderpressure.Thistypeofclassificationposes noproblemssoitis considered as the bestcrite

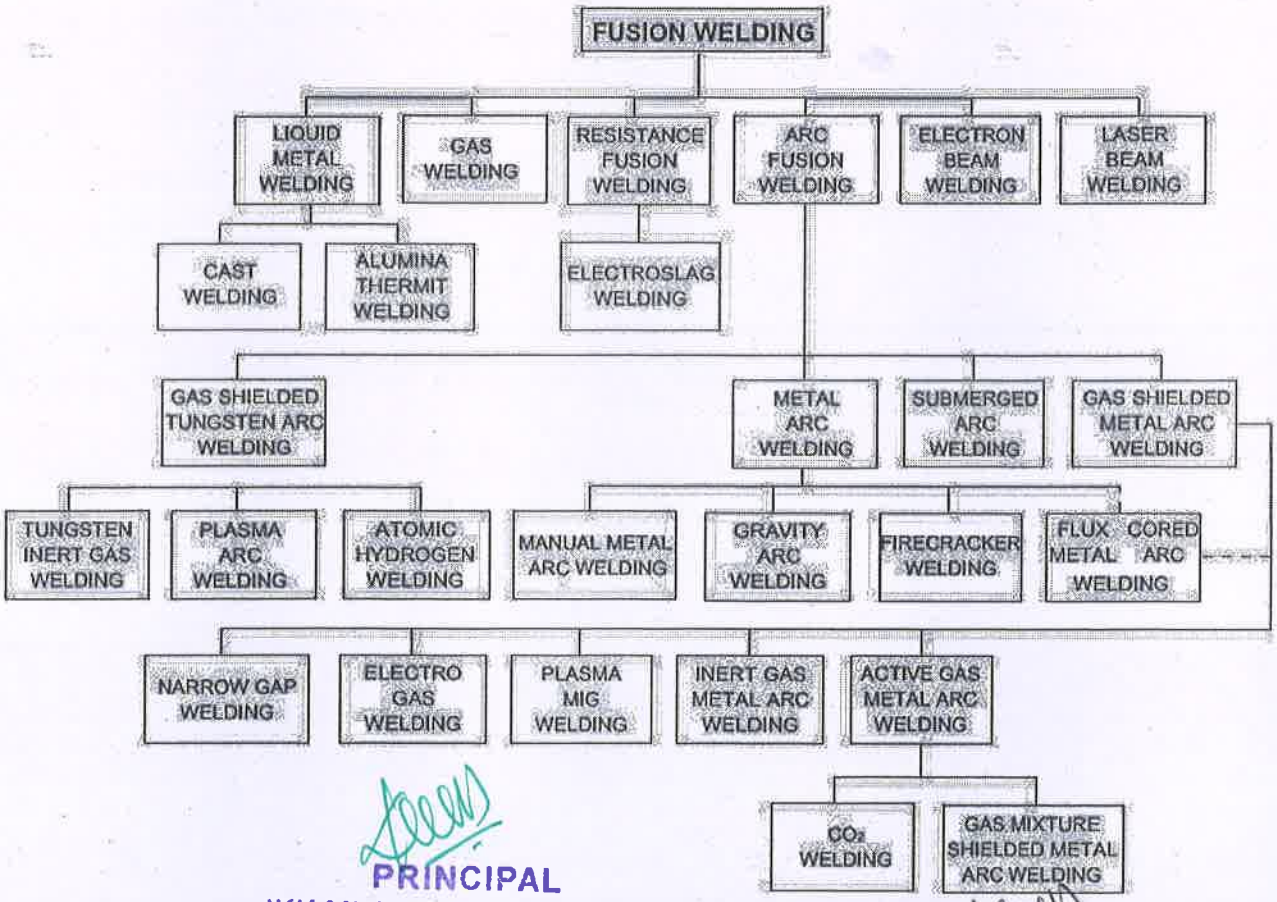

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Fig.ClassificationofFusionWeldingProcesses

UNIT II BRAZINGANDSOLDERING

Both brazing and soldering are the metal joining processes in which parent metal does not melt but only filler metal meltsfilling the joint with capillary action. If the filler metal is having melting temperature more than 450°C but lower than themelting temperature of components then it is termed as process of brazing or hard soldering. However, if the meltingtemperatureoffillermetalislowerthan450°Candalsolowerthanthemeltingpointofthematerial ofcomponentsthenitisknowas solderingor softsoldering.

Duringbrazingorsolderingfluxisalsoused whichperformsthefollowingfunctions:

- Dissolveoxides fromthesurfacestobejoined.
- Reducesurfacetensionofmoltenfillermetali.e.increasingitswettingactionorspreadability.
- Protectthesurface fromoxidation duringjoiningoperation.

Thestrength ofbrazedjointishigherthansolderedjoint butlowerthanweldedjoint.However,inbetweenweldingandbrazingthereis anotherprocesstermedas 'braze welding'.

BrazeWelding:

Fig 3.1(a) Two Components to be joined with V Joint

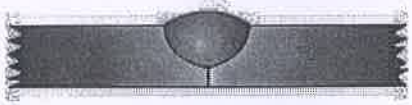

Fig 3.1(b) Welded Joint

Fig 3.1(c) Braze Welded Joint

Unlike brazing, in braze welding capillary action plays no role but the filler metal which has liquidus above 450 ° C butbelow the melting point of parent metal, fills the joint like welding without the melting of edges of parent metal. Duringthe operation, the edges of the parent metal are heated by oxy-acetylene flame or some other suitable heat source to thattemperature so that parent metal may not melt but melting temperature of filler metal is reached. When filler rod isbrought in contact with heated edges of parent metal, the filler rod starts melting, filling the joint. If edges temperaturefallsdownthenagainheat

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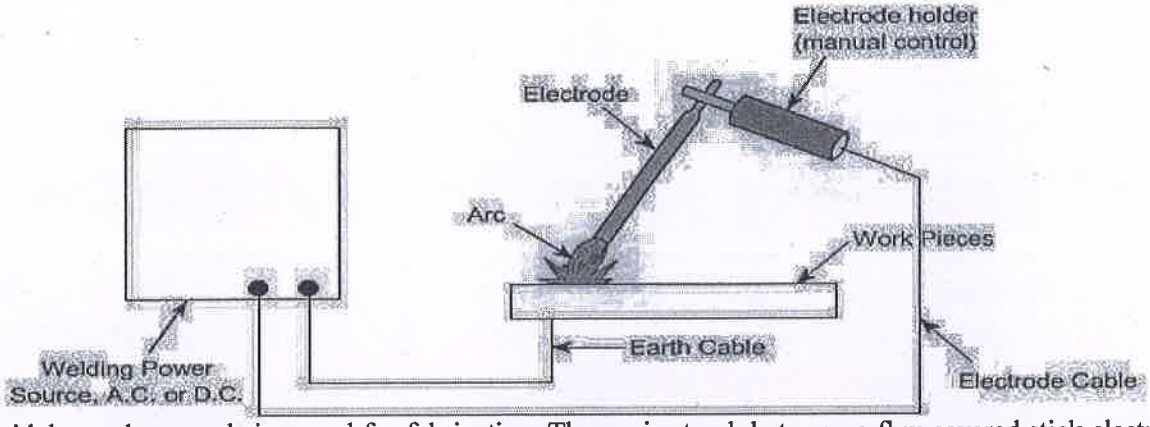
sourceisbroughtformeltingfillerrod.Themoltenfiller metaland parent metaledgesproduceadhesionon coolingresultingintostrongbraze weld

ManualMetal ArcWelding:

Manual metal arc welding (MMAW) or shielded metal arc welding (SMAW) is the oldest and most



widely used processbeing used for fabrication. The arc is struck between a flux covered stick electrode and the workpieces. The workpiecesaremadepart ofanelectriccircuit,knownasweldingcircuit.It includesweldingpowersource,weldingcables,electrodeholder,earth clampand theconsumablecoated electrode.Figure 5.1Shows detailsofweldingcircuit.

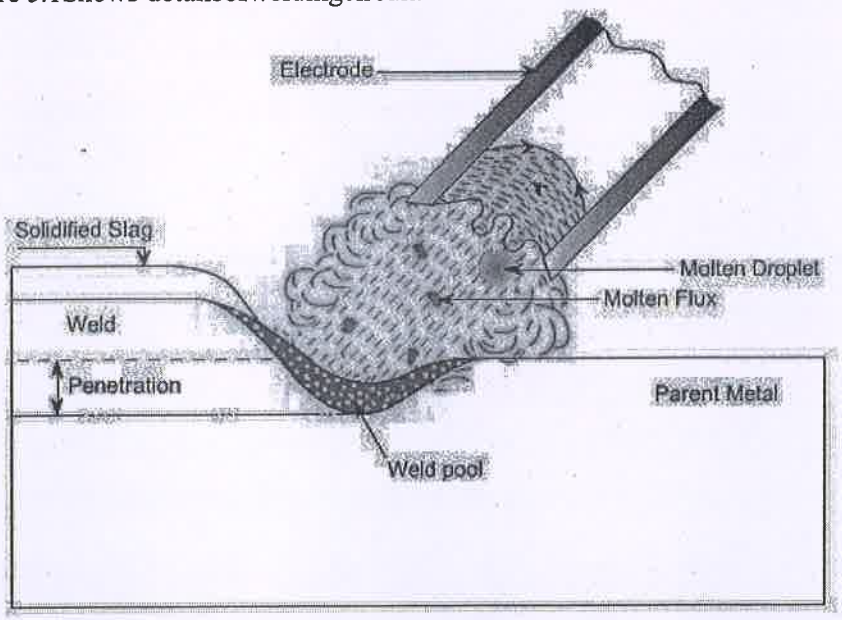


Figure shows the fine molten droplets of metal and molten flux coming from the tip of the coated electrode. The fluxmelts along with the metallic core wire and goes to weld pool where it reacts with molten metal forming slag which floatson the top of molten weld pool and solidifies after solidification of molten metal and can be removed by chipping andbrushing.

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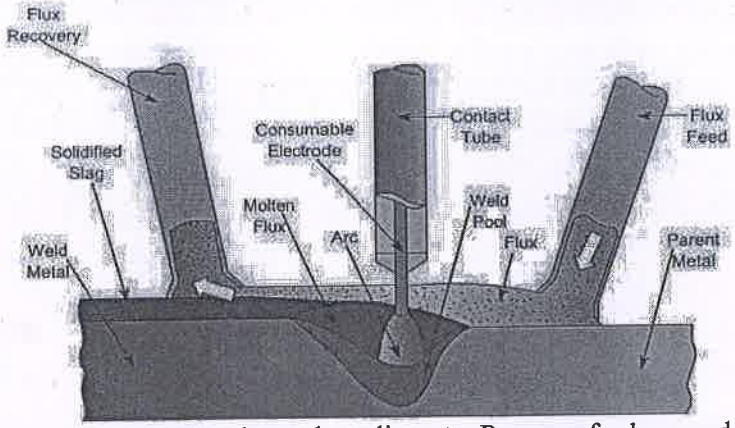
bmergedArcWelding:

Submergedarcweldingisanarcweldingprocessinwhichheat isgeneratedbyanarc whichisproducedbetween bareconsumable electrode wire and the workpiece. The arc and the weld zone are completely covered under a blanket ofgranular,fusibleflux whichmelts andprovidesprotection tothe weldpoolfromtheatmospheric gases.

The molten flux surrounds the arc thus protecting arc from the atmospheric gases. The molten flux flows downcontinuouslyandfreshfluxmeltsaroundthe arc.Themoltenflux reactswiththemoltenmetal formingslagandimprovesits properties and later floats on the molten/solidifying metal to protect it



froatmospheric gas contamination and retardscoolingrate. Process of submerged arc weldingis illustrated

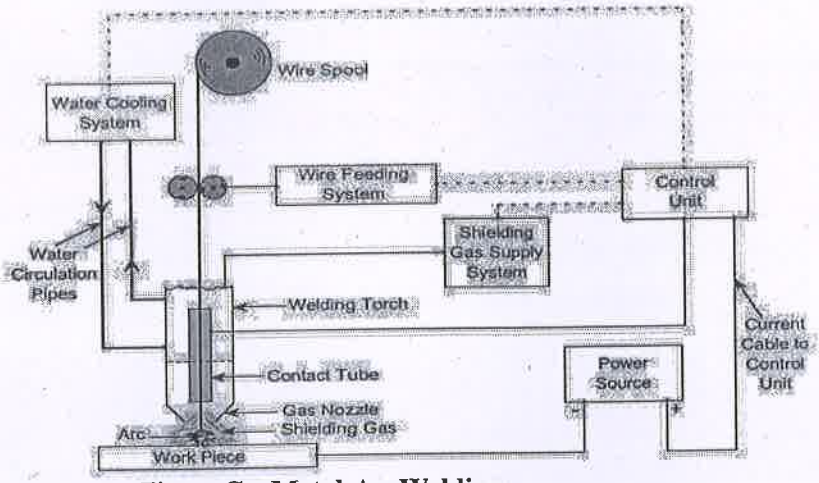


Figure **GasMetal ArcWelding**

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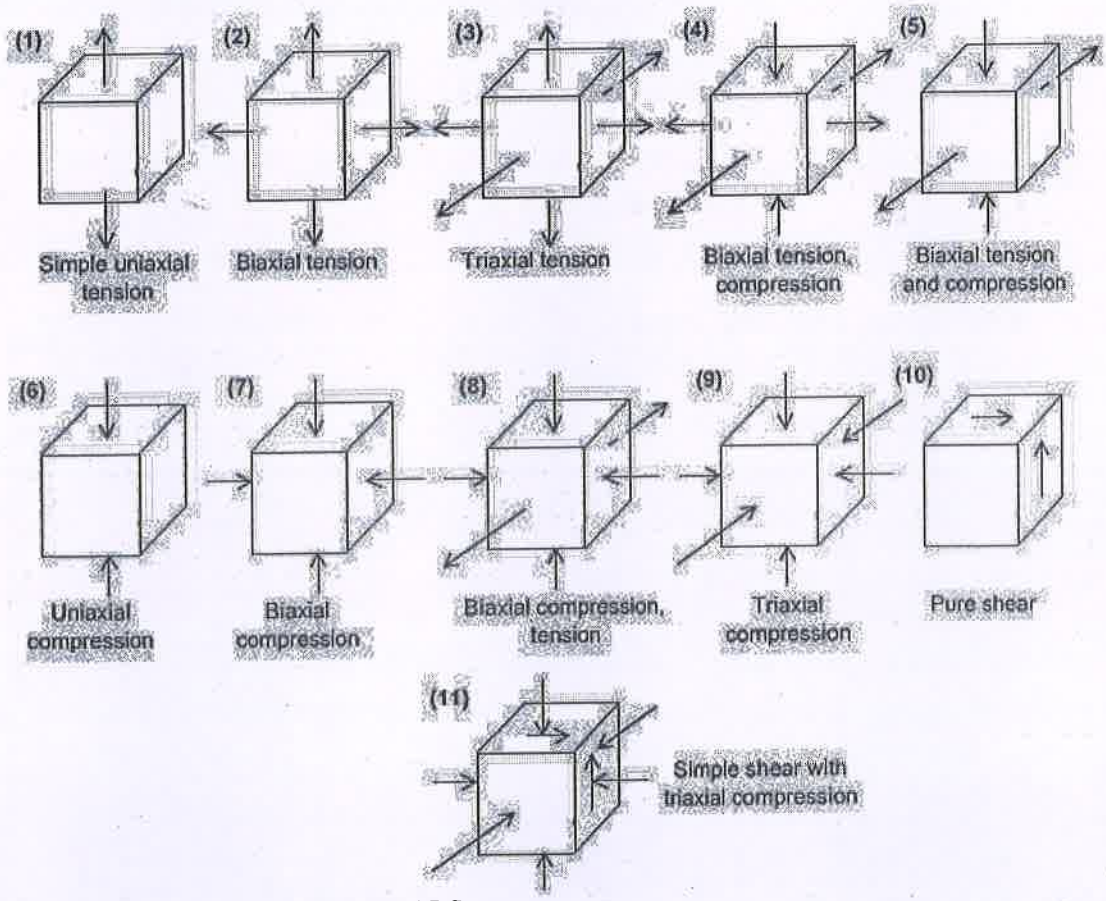
UNIT III FUNDAMENTALSOFMETALFORMING

There are four basic production processes for producing desired shape of a product. These are casting,machining, joining (welding, mechanical fastners, epoxy, etc.), and deformation processes. Casting processexploit the fluidity of a metal in liquid state as it takes shape and solidifies in a mold. Machining processesprovidedesired shapewith goodaccuracyandprecision buttend towaste materialinthegeneration ofremovedportions. Joining processes permit complex shapes to be constructed from simpler components and have a widedomainofapplications.

Deformation processes exploit a remarkable property of metals, which is their ability to flow plastically inthesolidstatewithoutdeteriorationoftheirproperties.Withtheapplicationofsuitablepressures,the materialismoved to obtain the desired shape with almost no wastage. The required pressures are generally high and thetools and equipment needed are quite expensive. Large production quantities are often necessary to justify theprocess.

Stateof thestressesmetal undergoduringdeformation.



COLDANDHOTWORKING OF METALS

ColdWorking:

Plastic deformation of metals below the recrystallization temperature is known as cold working. It is

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generallyperformedatroomtemperature.Insomecases,slightlyelevatedtemperaturesmaybeus edtoprovideincreasedductility and reduced strength. Cold working offers a number of distinct advantages, and for this reason variouscold-working processes have become extremely important. Significant advances in recent years have extendedtheuseof cold forming, and the trend appears likelyto continue.

In comparisonwithhotworking,theadvantagesofcoldworkingare

1. Noheatingisrequired
2. Betttersurfacefinishisobtained
3. Betterdimensional controlis achieved;thereforeno secondarymachining isgenerallyneeded.
4. Productspossessbetterreproducibilityandinterchangeablity.
5. Betterstrength,fatigue,andwearpropertiesofmaterial.
6. Directionalproperties canbeimparted.
7. Contaminationproblemsarealmostnegligible.

Somedisadvantagesassociatedwithcold-workingprocessesare:

1. Higherforcesarerequiredfordeformation.
2. Heavierandmorepowerful equipment isrequired.
3. Lessductilityisavailable.
4. Metalsurfacesmustbeclean andscale-free.
5. Strainhardeningoccurs(mayrequireintermediateannealing).
6. Undesirable residualstresses maybeproduced

WarmWorking:

Metal deformation carried out at temperatures intermediate to hot and cold forming is called *WarmForming*. Comparedto coldforming, warmforming offersseveral advantages.Theseinclude:

- Lesserloadsontooling andequipment
- Greatermetalductility

HotWorking:

Plastic deformation of metal carried out at temperature above the recrystallization temperature, is calledhot working. Under the action of heat and force, when the atoms of metal reach a certain higher energy level,the new crystals start forming. This is called recrystallization. When this happens, the old grain structuredeformed by previously carried out mechanical working no longer exist, instead new crystals which are strain-free are formed.

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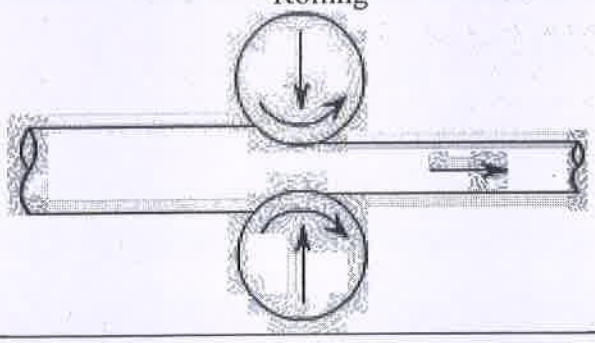
Inhotworking,thetemperatureatwhich the workingis completediscritical sinceanyextraheatleftinthematerialafter workingwill promotegrain growth,leadingto poormechanical propertiesof material.

In comparisonwithcoldworking,theadvantagesofhotworkingare

1. Nostrainhardening
2. Lesserforcesarerequiredfordeformation
3. Greaterductilityofmaterial isavailable, and thereforemoredeformationis possible.
4. Favorablegrainsizeisobtainedleadingtobetter mechanicalpropertiesof material
5. Equipmentoflesserpowerisneeded
6. Noresidualstressesinthematerial.

Somedisadvantagesassociatedinthehot-workingofmetalsare:

1. Heatenergyis needed
2. Poorsurfacefinish ofmaterial duetoscaling ofsurface
3. Pooraccuracyand dimensionalcontrol ofparts
4. Poorreproducibilityandinterchangeabilityofparts
5. Handlingandmaintaining ofhot metalisdifficult andtroublesome
6. Lowerlifeof toolingandequipment.

Number	Process	StateofStressin Main PartDuringForming
1	Rolling 	Bi-axialcompression

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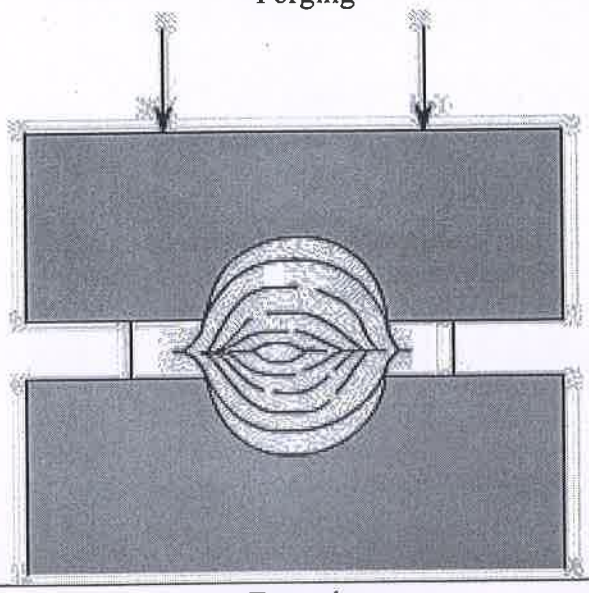
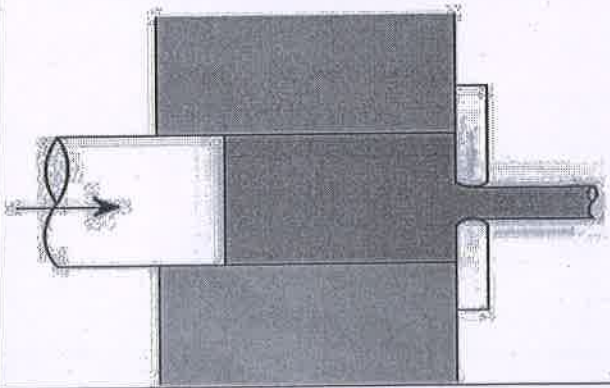
2	Forging 	Tri-axialcompression
3	Extrusion 	Tri-axialcompression

Fig .Common metalforming processes.State ofstress experiencedbymetalisalso given

UNIT IV SHEETMETALPROCESSES

BENDING

Bending is one very common sheet metal forming operation used not only to form shapes like seams,corrugations,andflangesbutalso toprovide stiffnesstothe part(byincreasingits momentofinertia).

As a sheet metal is bent itsfibres experience a distortion such that those nearer its outside,convexsurfaceareforced to stretchand come intension, while theinnerfibres comein compression.

Somewhere, in the cross section, there is a plane which separates the tension and compression zones. This planeis parallel to the surface around which the sheet is bending, and is called neutral axis. The

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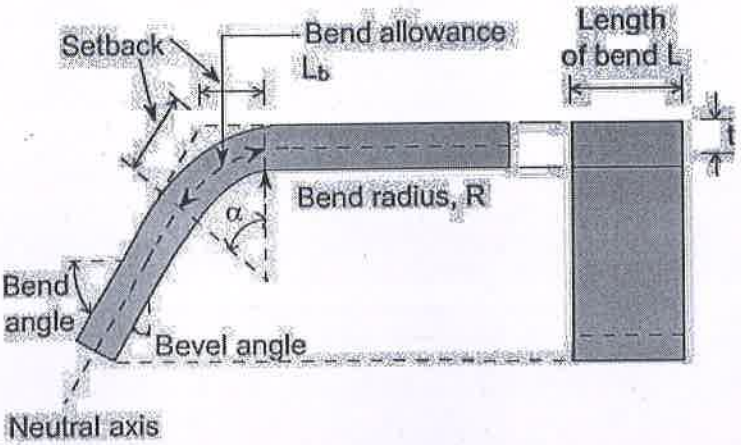
position of neutralaxis depends on the radius and angle of bend. Further, because of the Poisson's ratio, the width of the part L intheouter region issmaller, and in theinnerregionit islarger, than the initialoriginal width.



BENDALLOWANCE

Itis thelength of theneutral axisin the bend, Thisdetermines theblank length neededforabentpart. It can beapproximatelyestimatedfrom therelation

$L_b = a(R + kt)$
where,L_b=bendall
owance(mm)a=be
ndangle (radian)
R=bend radius(mm)
t=thickness ofsheet (mm),and
k=constant, whosevalue maybetaken as1/3 whenR <2t,and as1/2 w

INIMUMBEND RADIUS

Astheratioof thebend radiusto thethickness ofsheet (R/ t)decreases, thetensilestrainon theouterfibres of sheet increases. If R / t decreases beyond a certain limit, cracks start appearing on the surface ofmaterial.This limit is called*MinimumBend Radius*forthematerial.

Minimumbendradius isgenerallyexpressedinterms ofthe thicknessofmaterial, suchas 2t,3t,4t, etc.Tablegivestheminimum bendradiusallowedfordifferent materials.

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Material	Condition	
	Soft	Hard
Aluminumalloys	0	6t
Berylliumcopper	0	4t
Brass,low-leaded	0	2t
Magnesium	5t	13t
Steels		
Austeniticstainless	0.5t	6t
Low-carbon,low-alloy	0.5t	4t
Titanium	0.7t	3t
Titaniumalloys	2.5t	4t

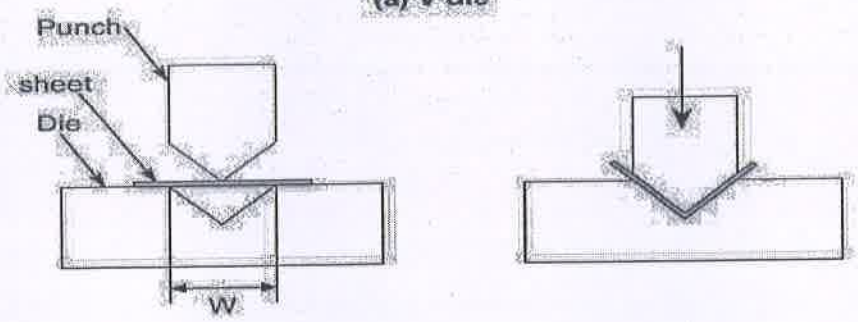
TableMinimumBendradiusforVariousMaterialsatRoomTemperatur

BendingForce:

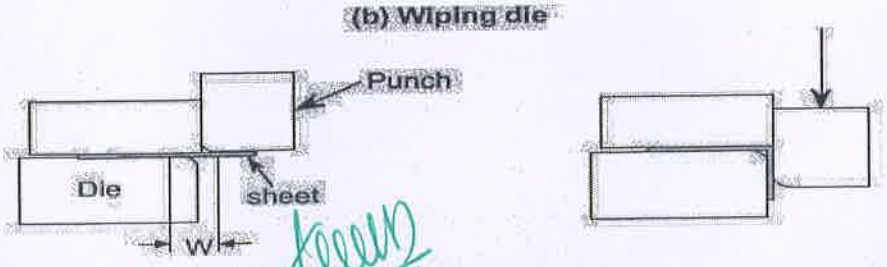
There are two general types of die bending : V – die bending and wiping die bending. V – die bending isusedexpensivelyin brakedie operationsand stampingdieoperations.

The bending forcecan beestimatedfromthefollowing simplerelation.$P=k.Y.L.t^2/D$

(a) V die



(b) Wiping die



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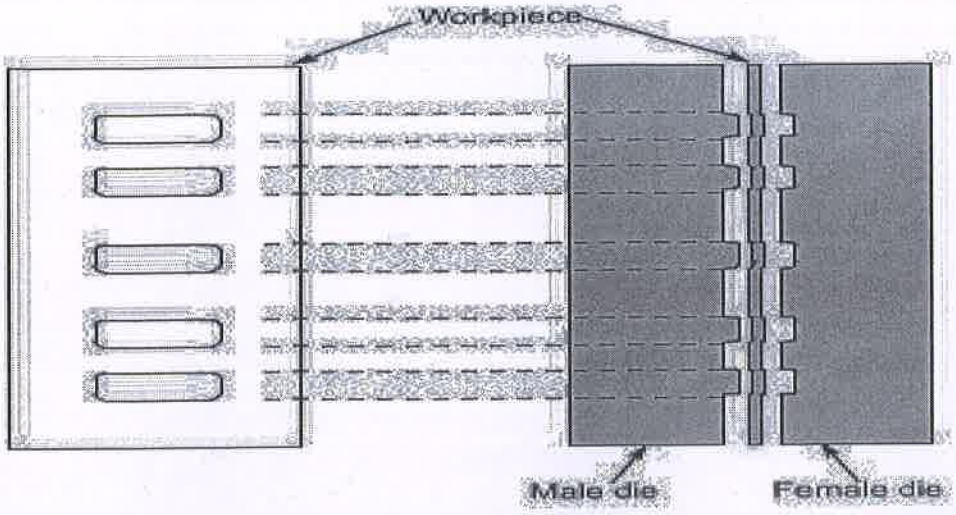
where P is bending force, g is the yield stress of the material, L is the bend length (bend allowance), t is thesheet thickness, D is the die opening and k is a constant whose value can be taken as 1.3 for a V-die and 0.3 forawiping die.Fig 6.2 shows various types of bending dies

EMBOSSING

Embossing is an operation in which sheet metal is drawn to shallow depths with male and femalematching dies, The operation is carried out mostly for the purpose of stiffening flat panels.Theoperationisalsosometimesusedformakingdecorationitemslikenumberplatesornameplates,jewelry,etc.



Embossingoperationwithtwodies.Letters,numbersanddesignsonsheet-metalpart

COINING

Coining is a severe metal squeezing operation in which the flow of metal occurs only at the top layers ofthe material and not throughout the values. The operation is carried out in closed dies mainly for the purpose ofproducing fine details such as needed in minting coins, and medal or jewelry making. The blank is kept in thedie cavity and pressures as high as five to six times the strength of material are applied. Depending upon thedetailsrequired to becoined on the part, morethan onecoining operationsmaybeused.

The difference between coining and embossing is that the same design is created on both sides of theworkpieceinembossing(onesidedepressed andthe otherraised),whereas incoiningoperation,a differentdesignis created oneachside ofwork piece.

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DrawingForce.

Fordrawingcylindricalshells havingcircularcrosssection, themaximumdrawing forcePcanbedeterminedfrom therelation
P=k.t.d.t.Y

UNIT V POWDERMETALLURGY

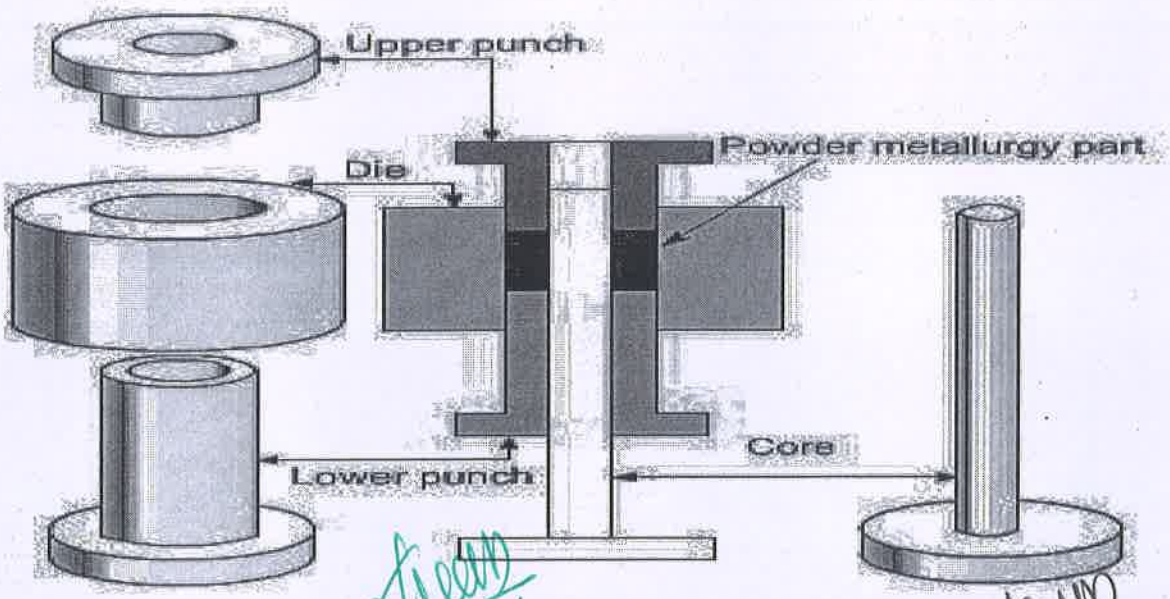
Powder metallurgy (PM) is a metal working process for forming precision metal components from metalpowders.Themetal powder isfirst pressed into productshapeat room temperature.This is followed byheating(sintering)that causes the powder particles to fusetogether without melting.

The parts produced by PM have adequate physical and mechanical properties while completely meetingthe functional performance characteristics. The cost of producing a component of given shape and the requireddimensional tolerances by PM is generally lower than the cost of casting or making it as a wrought product,because of extremely low scrap and the fewer processing steps. The cost advantage is the main reason forselectingPM asaprocessof productionfor high– volumecomponent

whichneeds tobeproducedexactlyto,orclose to, final dimensions. Parts can be produced which are impregnated with oil or plastic, or infiltrated withlowermelting pointmetal. Theycanbeelectroplated, heattreated,and machinedifnecessary.

Therateof productionofparts isquitehigh, afewhundreds toseveralthousands perhour.

Industrial applications of PM parts are several. These include self – lubricating bearings, porous metalfiltersand awiderangeofengineered shapes, such as gears,cams,brackets,sprockets,etc.



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Typicalset of powdermetallurgytools.

1. Withtheupper punch in thewithdrawn position, theemptydiecavityis filled with mixedpowder.
2. Themetal powder inthedie is pressedbysimultaneous movement ofupper and lower punches.
3. Theupperpunch iswithdrawn,and the green compactisejectedfromthediebythe lowerpunch.
4. Thegreen compactis pushedout ofthepressingareaso thatthenextoperating cyclecan start.

Thiscompactingcycleisalmostthesamefor allparts.

Sintering: During this step, the green compact is heated in a protective atmosphere furnace to a suitabletemperature, which is below the melting point of the metal. Typical sintering atmospheres are endothermic gas,exothermicgas, dissociatedammonia, hydrogen,and nitrogen.Sintering temperaturevariesfrom metaltometal; typically these are within 70 to 90% of the melting point of the metal or alloy

Material	Temperature (°C)	Time
Copper,brass,bronze	1000-1150	10-40
Nickel	1100-1290	30-40
Stainlesssteels	1200-1500	30-60
Ferrites	1430-1500	10-600
Tungstencarbide	2050	20-30
Molybdenum	2350	120
Tungsten	2400	480
Tantalum		480

SECONDARYANDFINISHINGOPERATIONS

Sometimesadditionaloperationsarecarried outonsintered PMpartsinordertofurtherimprovetheirpropertiesor to impartspecial characteristics. Someimportantoperations areas under.

1. Coiningandsizing.Thesearehighpressurecompactingoperations.Their mainfunctionistoimpart (a)greater dimensional accuracy to the sintered part, and (b) greater strength and better surface

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finish byfurtherdensification.

Forging. The sintered PM parts may be hot or cold forged to obtain exact shape, good surface finish,good dimensional tolerances, and a uniform and fine grain size. Forged PM parts are being increasinglyusedforsuchapplicationsas highlystressedautomotive,jet– engine andturbinecomponents

1. Impregnation. The inherent porosity of PM parts is utilized by impregnating them with a fluid like oil orgrease. A typical application of this operation is for sintered bearings and bushings that are internallylubricated with upto 30% oil by volume by simply immersing them in heated oil. Such components havea continuous supply of lubricant by capillary action, during their use. Universal joint is a typical grease –impregnatedPM part.
2. Infiltration. The pores of sintered part are filled with some low melting point metal with the result thatpart's hardness and tensile strength are improved. A slug of metal to be impregnated is kept in closecontact with the sintered component and together they are heated to the melting point of the slug. Themoltenmetal infiltrates thepores bycapillaryaction.When the processis complete, thecomponenthasgreater density, hardness, and strength. Copper is often used for the infiltration of iron – base PMcomponents. Lead has also been used for infiltration of components like bushes for which lowerfrictionalcharacteristics areneeded.
3. HeatTreatment.SinteredPMcomponentsmaybeheattreatedforobtaining greaterhardnessorstrengthin them.
4. Machining.Thesinteredcomponentmaybemachined byturning,milling, drilling, threading,grinding,etc.to obtain various geometric features.
5. Finishing. Almost all the commonly used finishing method are applicable to PM parts. Some of suchmethodsareplating, burnishing, coating, and colouring.

Plating. For improved appearance and resistance to wear and corrosion, the sintered compacts may be plated byelectroplatingorotherplatingprocesses.To avoidpenetrationandentrapmentofplatingsolutionintheporesofthe part, an impregnation or infiltration treatment is often necessary before plating. Copper, zinc, nickel,chromium,and cadmiumplating can beapplied.

Burnishing. To work harden the surface or to improve the surface finish and dimensional accuracy, burnishingmay be done on PM parts. It is relatively easy to displace metal on PM parts than on wrought parts because ofsurfaceporosityin PM parts.

Coating. PM sintered parts are more susceptible to environmental degradation than cast and machined parts.Thisis becauseofinter –connectedporosityin PMparts. Coatings fillin theporesand seal theentirereactivesurface.

Colouring.FerrousPMpartscanbeappliedcolourfor protectionagainstcorrosion.Severalmethodsareinuseforcolouring. Onecommonmethod to blacken ferrousPM parts isto do itchemically,using asaltbath.

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POWDERMETALLURGY

Advantages:Metalinpowderformis costlierthaninsolidform.Further, expensivediesandequipmentneededtoadapt thisprocess impliesthat theprocess isjustified bythe unusual propertiesobtained inthe products.
Powdermetallurgyoffers the followingspecificadvantages.

Partscan beproducedfrom high melting pointrefractorymetals withrespectivelyless difficultyandatless cost.

2.Productionratesarehighevenfor complexparts.This isprimarilybecause oftheuseof automatedequipmentin the process.

iii. Nearnet shape components areproduced. Thedimensional toleranceson components aremostlysuchthatno further machining is needed. Scrap isalmost negligible.

iv. Parts can be made from a great variety of compositions. It is therefore much easy to have parts ofdesiredmechanicalandphysicalpropertieslikedensity,hardnesstoughness,stiffness,dampin g,andspecificelectrical or magneticproperties.

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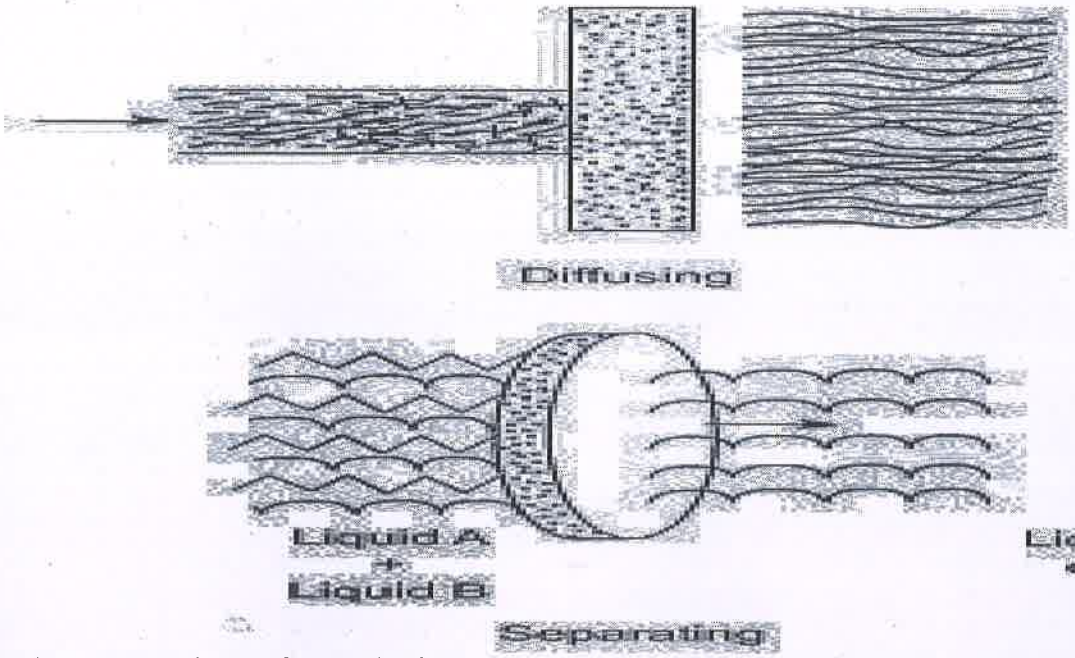
v. Partscanbeproducedwithimpregnationandinfiltrationofothermaterialstoobtainspecialcharacteristicsneeded forspecificapplications.

Electrical Parts. The possibility of combining several metal powders and maintaining some characteristics



ofeach has promoted PM for production of electric contact parts. These parts are required to have excellentelectrical conductively, be wear resistant, and somewhat refractory. Several combinations such as copper –tungsten, cobalt – tungsten, silver – tungsten, copper-nickel, and silver – molybdenum have been used forproduction oftheseparts

EconomicsofPowderMetallurgy:

Since it is possible to produce near net shape parts by PM, there is usually very little scrap and also noneedforsecondarymanufacturing andassemblyoperations. PM is thereforebecoming increasinglycompetitivewith conventional manufacturing processes like forging, casting, and machining. The high initial cost of dies,punches,andequipmentforPMprocessing,however,requires sufficientlyhighproductionvolumetomakethisprocesscost – effective

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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

CS3491-THEORY OF COMPUTATION QUESTION BANK

UNITI AUTOMATA AND REGULAR EXPRESSIONS

Need for automata theory – Introduction to formal proof – Finite Automata (FA) – Deterministic FiniteAutomata (DFA) – Non-deterministic Finite Automata (NFA) – Equivalence between NFA and DFA Finite Automata with Epsilon transitions – Equivalence of NFA and DFA- Equivalence of NFAs with and without ε-moves- Conversion of NFA into DFA – Minimization of DFAs.

PART–A

Q.No	Questions	BTLevel	Competence
1.	Differentiate between DFAandNFA.	BTL-2	Understand
2.	Define DFA	BTL-1	Remember
3.	Defineinductiveproof.	BTL-1	Remember
4.	IdentifyNFA-εto represent a*b|c	BTL-1	Remember
5.	ConsidertheStringX=110andy=0110find i)XYii) X^2iii)YX iv)Y^2	BTL-4	Analyze
6.	Describethefollowinglanguage over the theinputsetA={a,b}L={ a^nb^n|n>=1}	BTL-4	Analyze
7.	Describe what is non deterministicfiniteautomataandtheapplicationsofautomata theory.	BTL-1	Remember

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8.	Illustratetheinductionprinciple?	BTL-3	Apply
9.	Whatisproofbycontradiction?	BTL-1	Remember
10.	Describeanidentifierwithatransitiondiagram(automata).	BTL-2	Understand
11.	Defineε-NFA	BTL-1	Remember
12.	Summarizeminimization ofDFA	BTL-5	Evaluate
13.	Givethenondeterministicautomatatoacceptstringscontaining the substring0101	BTL-2	Understand
14.	IllustrateifLbeasetacceptedbyan NFAthen thereexistsaDFAthatacceptsL.	BTL-3	Apply
15.	Definethetermepsilontransition.	BTL-2	Understand
16.	Summarize theextendedtransitionfunctionfor aε-NFA	BTL-5	Evaluate
17.	CreateaFAwhichacceptstheonlyinput101overtheinputset Z={0,1}	BTL-6	Create
18.	Describe a Finite automata and give its types.	BTL-4	Analyze
19.	Illustrate deductive proof.	BTL-3	Apply
	PART-B		
	(i) Explainif L is accepted by an NFA with ε-transition then showthat LisacceptedbyanNFAwithoutε-transition.(6) (ii) ConstructaDFAequivalenttotheNFA.M=({p,q,r},{0,1},	BTL-5	Evaluate

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1.	δ,p,{q,s}) Where δ is defined in the followingtable.(7)		
2.	Proveforeveryn>=1 bymathematicalinduction ∑(i)={n(n+1)/2}.	BTL-3	Apply
3.	Let L be a set accepted by a NFA then show that there exists aDFAthat acceptsL.(13)	BTL-1	Remember
4.	Give the NFA that accepts all strings that end in 01.Giveitstransitiontableandtheextendedtransitionfunctio nfortheinputstring 00101.Also construct a DFA for the above NFA usingsubset constructionmethod.(13)	BTL-2	Understand
5.	ConstructDFAequivalenttotheNFAgiven below:(13)	BTL-2	Understand

UNIT II REGULAR EXPRESSIONS AND LANGUAGES

Regular expression – Regular Languages- Equivalence of Finite Automata and regular expressions –Proving languages to be not regular (Pumping Lemma) – Closure properties of regular languages.

PART-A

Q.No	Questions	BTLevel	Competence
1.	List theoperatorsofRegular Expressions	BTL-1	Remember
2.	Differentiatebetweenregularexpressionandregular	BTL-1	Remember
3.	Tabulatetheregularexpressionforthefollowing L1=setof strings0 and1 endingin 00	BTL-4	Analyze
4.	Whataretheclosurepropertiesofregularlanguages?	BTL-2	Understand

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5.	Explainafiniteautomatonfortheregularexpression0*1*.	BTL-1	Remember
6.	Illustrateare regularexpressionforthesetofallthestrings	BTL-1	Remember
7.	Illustrateare regularexpressionforthesetofallthestringshave oddnumberof1'sR.E=1(0+11)*	BTL-3	Apply
8.	Composethedifferencebetweenthe+ closureand*closure	BTL-4	Analyze
9.	Illustrateare regular expressionforthesetof allstringsof0's	BTL-2	Understand
10.	WhatistheClosurepropertyof regular setS.?	BTL-2	Understand
11.	Findoutthelanguagegeneratedbytheregul arexpression(0+1)*.	BTL-2	Understand
12.	Namethefour closurepropertiesof RE.	BTL-5	Evaluate
13.	IsittruethelanguageacceptedbyanyNFAisdifferentfromther egularlanguage?Justifyyouranswer.	BTL-1	Remember
14.	Showthecomplement tofaregularlanguageisalsoregular.	BTL-4	Analyze
15.	Construct aDFAfortheregularexpressionaa*bb*.	BTL-3	Apply
16.	StatetheprecedenceofREoperator.	BTL-3	Apply
17.	ConstructREforthelanguageoverthesetz={a,b}inwhichTota lnumberofa'saredivisible by3.	BTL-5	Evaluate
18.	DefineRE.	BTL-6	Create

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19.	CreateREtodescribeanidentifierandpositiveinteger.	BTL-1	Remember
20.	CreateREtodescribeanidentifierandpositiveinteger.	BTL-6	Create
	PART-B		
1.	DemonstratehowthesetL={ab^n/n>=1}isnot ar regular.(13)	BTL5	Evaluate
2.	Express that the regular languages are closed under:(13)(a)union(b)intersection(c)KleeneClosure (d)Complement(e)Difference	BTL-1	Remember
3.	Examinewhetherthelanguage L=(0^n1^n|n>=1)isregularorn ot? Justifyyouranswer(13)	BTL-2	Understand
4.	(i) DescribeaRegularExpression. WriteaRegularExpressi onfor thesetof stringsthatconsistsof alternating0'sand1's. (ii) ConstructFiniteAutomataequivalenttotheregu larexpression(ab+a)*(7).	BTL1	Remember
5.	(i) Describe theclosurepropertiesofregularlanguages.(6) (ii) DescribeNFAwithepsilonfortheRE=(a/b)*aba ndconvertitinto DFAand further find theminimized DFA.	BTL1	Remember
6.	DemonstratehowthesetL= {a^nb^n/n>=0}isnotare regular.(13)	BTL-3	Apply
7.	Verifythewhether L={a2n|n>=1}regular(13)	BTL-3	Apply

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8.	i) ProveThereverseofaregularlanguageisregular(6) ii) Ahomomorphismofregularlanguageisregular(7)	BTL-4	Analyze
9.	Discussonregularexpressions	BTL-2	Understand
10	ConstructNDFAforgivenREusingThomsonrule.(13) i) a.(a+b)*ab ii) (a.b)* iii) (a+b)	BTL-6	Create
11	ExplaintheDFAMinimizationalgorithmwithan example.	BTL-1	Remember
12	ProvetheL1andL2aretwolanguagesthenL1-L2isregular	BTL4	Analyze
13	i) ProvetheL1andL2aretwolanguagesthenL1UL2isregular(7) ii) ProvetheL1andL2aretwolanguagesthen L1intersectionL2isregular(6)	BTL-4	Analyze

UNITIII CONTEXT FREE GRAMMAR AND PUSH DOWN AUTOMATA

Types of Grammar – Chomsky's hierarchy of languages -Context-Free Grammar (CFG) and Languages – Derivations and Parse trees – Ambiguity in grammars and languages – Push Down Automata (PDA): Definition – Moves – Instantaneous descriptions -Languages of pushdown automata – Equivalence of pushdown automata and CFG-CFG to PDA-PDA to CFG – Deterministic Pushdown Automata.

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PART-A			
Q.No	**Questions**	**BTLevel**	**Competence**
1.	ExpressthewaysolanguagesacceptedbyPDAanddefinethem?	BTL2	Understand
2.	Summarize PDA .Convertthe following CFG to PDAS -->aAA,A-->aS|bS|a.	BTL2	Understand
3.	DefineambiguousgrammarandCFG	BTL1	Remember
4.	Defineparsetreean derivation.	BTL1	Remember
5.	ExaminethecontextfreeGrammar representingthesetoPalindrome over(0+1)*	BTL2	Understand
6.	Compare Deterministic and Non deterministic PDA. Is it truethat nondeterministic PDA is more powerful thanthat ofdeterministicPDA? Justifyyouranswer.	BTL2	Understand
7.	WhenisPDAsaid tobedeterministic?	BTL1	Remember
8.	Design equivalence of PDA and CFG.	BTL1	Remember
9.	PointoutthelanguagesgeneratedbyaPDAusingfinalstateofth ePDAandemptystackofthat PDA	BTL6	Create
10.	Illustrate the rule for construction of CFG from given PDA.	BTL4	Analyze
11.	Give a CFG for the language of palindrome string over {a,b}.Write the CFG for the language, $L=(a^n b^n \mid n \geq n)$.	BTL3	Apply

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12.	What is Instantaneous Descriptions(ID)	BTL5	Evaluate
13.	ShowthatL={$a^{p/p}$isprime}isnotcontextfree.	BTL1	Remember
14.	Infer the CFG for the set of strings that contains equal number of a's and b's over ∑ ={a,b}	BTL3	Apply
15.	Point out the various types of grammar with example	BTL4	Analyze
16.	Illustrate the rightmost derivation (a+b)*c for using the grammar and also state whether a given grammar is ambiguous one or not.E-->E+E/E*E/(E)/id	BTL1	Remember
17.	Point out the additional features a PDA has when compared with NFA.	BTL3	Apply
18.	Convince your answer of acontext free grammar for the given expression (a+b) (a+b+0+1)*	BTL4	Analyze
19.	Convince your answer of acontext free grammar for the given expression (a+b) (a+b+0+1)*	BTL6	Create
	PART-B		
1.	(i) Discuss about PDA and CFL Prove the equivalence of PDAandCFL.(6)IfLisContextfreelanguagethenprovethatthereexistsPDAMsuchthatL=N(M).(7)	BTL2	Understand
2.	**(i)** Describe the different types of acceptance of a PDA.Aretheyequivalentinsenseoflanguageacceptance?Justifyyouranswer.(7) **(ii)** Design a PDA to accept {0^n1^n|n>1}.Draw the transitiondiagramforthePDA andidentifytheinstantaneousdescription(ID)ofthePDAwhichacceptsthestring'0011.(6)	BTL1	Remember

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UNIT IV NORMAL FORMS AND TURING MACHINES

Normal forms for CFG – Simplification of CFG- Chomsky Normal Form (CNF) and Greibach NormalForm (GNF) – Pumping lemma for CFL – Closure properties of Context Free Languages – TuringMachine : Basic model – definition and representation – Instantaneous Description – Languageacceptance by TM – TM as Computer of Integer functions – Programming techniques for Turingmachines (subroutines).

PART-A

Q.No	Questions	BT Level	Competence
1.	ConcludetheprocedureforconvertingCNFtoGNF withanexample	BTL2	Understand
2.	IllustratetheBasicTuringMachinemodelandexplaininonemove.What are the actionstake place inTM?	BTL3	Apply
3.	Definethe twonormalformsofCFG	BTL1	Remember
4.	Point out the hierarchy summarized intheChomskyhierarchy..	BTL4	Analyze
5.	Define thepumpingLemmaforCFLs	BTL1	Remember
6.	DefineTuringMachine.	BTL1	Remember
7.	DiscusstheapplicationsofTuringmachine.	BTL2	Understand
8.	Define Chomskianhierarchyoflanguage.	BTL1	Remember
9.	What is the class of language for which the TM	BTL2	Understand

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	has bothacceptingandrejectingconfiguration?		
10.	ExplainthespecialfeaturesofTM?DefineuniversalTM.Define InstantaneousdescriptionofTM	BTL5	Evaluate
11.	DefineGNF.	BTL1	Remember
12.	Preparethedifferencebetweenfiniteautomataandturingmachine.	BTL6	Create
13.	Listthethreewaystosimplifyacontextfreegrammar. Whatare the propertiesoftheCFL generatedbya CFG?	BTL5	Evaluate
14.	Drawatransition diagramforaTuringmachinetoidentifynmod2.	BTL1	Remember
15.	ExpressthetechniquesforTMconstruction.	BTL2	Understand
16.	Developtheshortnoteson two-way infinitetapeTM.	BTL6	Create
17.	DifferentiateTMand PDA.	BTL4	Analyze
18.	PointouttheroleofcheckingoffsymbolsinaTuringMachine	BTL4	Analyze
19.	IllustrateHaltingProblem.	BTL3	Apply
	PART-B		
1.	Use the CFL pumping lemma to show howeach of theselanguagesnot tobecontext-free{$a^ib^jc^k$|i<j<k}	BTL2	Understand
2.	(i) Discussa TM to accept the language LE={1^n 2^n 3^n|n >= 1} (ii) Construct a turing machine that estimate unarymultiplication(Say111X11=11111)	BTL2	Understand

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3.	(i) Illustrate the Turing machine for computing f(m, n)=m-n(propersubtraction). (ii) DemonstrateaTuringMachineto computef(m+n)=m+n,m,n>=0 andsimulatetheiractionontheinput0100.	BTL3	Apply
4.	(i) Examinethe role of checking off symbols in a Turing Machine. (ii) DescribeaTuringMachineMtoimplementthefu nction"multiplication" usingthe subroutine copy	BTL1	Remember
5.	(i) Demonstratetheimplicationsofhaltingproblem. (ii) Show thatifalanguageis acceptedby a multitapeturing machine, itisacceptedbyasingle-tapeTM.	BTL3	Apply
6.	(i) Summarizeindetail aboutmultiheadandmultitapeTMwithan example. (ii) ConstructaTuringMachinetoacceptpalindromesi nanalphabetset∑={a,b}.Tracethestrings"abab"and" baab".	BTL5	Evaluate
7.	(i) Explain the TM as computer of integer function with anexample.(7) (ii) Design aTMto implementthefunctionf(x)=x+1.(6)	BTL4	Analyze
8.	(i) DesignaTMtoacceptthesetofallstrings{0,1}with0 10assubstring. (ii) WriteshotnotesonTwo–wayinfinite tapeTM.	BTL6	Created

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9.	(i)Describecomputing a partial function with a TM.(6)(ii)DesignaTMtoacceptthelanguageLE={$a^n b^n c^n$|n>1}.	BTL1	Remember
10.	(i) DefineTuringmachineforcomputingf(m,n)=m*n,n €N. (ii) WritenotesonPartial solvability	BTL-1	Remember
11.	(i) ConstructaTMtoreversethegiven string{abb}.(6) (ii) ExplainMultitapeandMultiheadTuringmachine withsuitable example.(7)	BTL2	Understand
12.	(iii) ConstructaTMtoreversethegiven string{abb} (iv) ExplainMultitapeandMultiheadTuringmachine with suitable example.	BTL2	Understand

UNIT V UNDECIDABILITY

Unsolvable Problems and Computable Functions –PCP-MPCP- Recursive and recursively enumerablelanguages – Properties – Universal Turing machine -Tractable and Intractable problems – P and NPcompleteness – Kruskals algorithm – Travelling Salesman Problem- 3-CNF SAT problems.

PART-A

Q.No	Questions	BT Level	Competence
1.	Distinguish between PCP and MPCP? What are the concepts used in UTMs?	BTL2	Understand
2.	List out the features of universal turing machine.	BTL1	Remember

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3.	When are cursively enumerable language is said to be recursive? Discuss on it.	BTL2	Understand
4.	Compare and contrast recursive and recursively enumerable languages	BTL4	Analyze
5.	State when a problem is said to be decidable and give an example of an undecidable problem.	BTL1	Remember
6.	Define NP hard and NP completeness problem.	BTL1	Remember
7.	Define a universal language Lu?	BTL1	Remember
8.	Is it true that the language accepted by a non-deterministic Turing Machine is different from recursively enumerable language?Judgey our answer.	BTL5	Evaluate
9.	Formulate the two properties of recursively enumerable sets which are undecidable	BTL6	Create
10.	Whenaproblemissaidtobedecidable?Giveanexampleof undecidableproblem.Analyzeit.	BTL4	Analyze
11.	Whatis(a)recursivelyenumerablelanguages(b)recursive sets?Generalizeyouranswer.	BTL6	Create
12.	Define the classes of Pand NP.	BTL1	Remember
13.	Is it true that complement of are recursive language is recursive?Discuss your answer	BTL2	Understand

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14.	Describe an example of an undecidable problem	BTL1	Remember
15.	Point out the properties of recursive and recursive enumerablelanguage.	BTL4	Analyze
16.	Illustrate on Primitive Recursive Function.	BTL3	Apply
17.	Show the Properties of Recursive Languages	BTL3	Apply
18.	Explain about tractable problem.	BTL5	Evaluate
19.	Describe post correspondence problem.	BTL2	Understand
20.	Illustrate about Time and space complexity of TM.	BTL3	Apply

PART-B

1.	(i)Describe about the tractable and intractable problems.(7)(ii)Identify that" MPC Preduce to PCP".(6)	BTL1	Remember
2.	(i) DescribeaboutRecursiveandRecursiveEnumerablelanguagseswithexample.(7) (ii) State and describe RICE theorem.(6)	BTL1	Remember
3.	(i) Summarize diagonalization language.(6) (ii) Discuss the significance of universal turing machine and also construct a turing machine to add two numbers and encode it	BTL2	Understand
5.	(i)Explain computable functions with suitable example.(6)(ii)Explain in detail notes on Unsolvable Problems.(7)	BTL4	Apply

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6.	Describe in detail notes on universal Turing machines with example.	BTL1	Remember
7.	(i) Show that the diagonalization language is not are cursively enumerable.(7) (ii) Illustrate about unsolvability.(6)	BTL3	Apply
8.	(i)Compare the difference between recursive and recursively renumerable languages.(7) (ii)Explain about PCP.(6)	BTL5	Evaluate
9.	(i) Explain about Universal Turing machine and show that the universal language (Lu) is recursively enumerable but not recursive. Generalize your answer (ii) Design and explain how to measure and classify complexity	BTL6	Create
10.	(i) Explain about there cursively Enumerable Language with example.(6) (ii) Point out that the following problem is undecidable. Given two CFGs G1andG2is L(G1)□L(G2)=□.(7)	BTL4	Analyze
11.	(i) Show that the characteristic function of the set of all even number is recursive.(7) (ii) Illustrate in detail notes on primitive recursive. (iii)Give functions with examples.(6)	BTL-3	Apply

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CS8691-ARTIFICIAL INTELLIGENCE QUESTION BANK

UNIT I - INTRODUCTION

Introduction–Definition - Future of Artificial Intelligence – Characteristics of Intelligent Agents– Typical Intelligent Agents – Problem Solving Approach to Typical AI problems.

PART A

Q.NO	QUESTIONS	BTL	COMPETENCE
1.	Define Artificial Intelligence.	BTL-1	Remember
2.	Differentiate Natural Intelligence from Artificial Intelligence.	BTL-2	Understand
3.	Access what is meant by s Turing Test?	BTL-5	Evaluate
4.	Identify the capabilities, computer should possess to pass Turing test?	BTL- I	Remember
5.	Show what is meant by Total Turing Test?	BTL-3	Apply
6.	What arc the capabilities computers need to pass totalTuring test?	BTL-5	Evaluate
7.	Summarize about software agents?	BTL-3	Apply
8.	Why are condition-action rules important in the designofan agent?	BTL -1	Remember
9.	Infer the structure of an agent in an environment.	BTL-4	Analyze

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10.	Generalize what is s rational agent?	BTL-6	Create
11.	State and Express the concept of rationality.	BTL-2	Understand
12.	Analyze how to measure the performance of an agent?	BTL-4	Analyze
13.	Generalize and define Omniscience and informationGathering.	BTL-6	Create
14.	What is important for task environment'?	BTL -1	Remember
15.	List the properties of environments.	BTL -1	Remember
16.	Express the ways to formulate a problem?	BTL-2	Remember
17.	Order the different type of agents.	BTL-4	Analyze
18.	Give Structure of Simple Reflex Agent	BTL-2	Understand
19.	How can the performance of an agent are improved.	BTL-2	Understand
20.	Show what are the three classes of problem?	BTL-3	Apply
	PART B		
1.	Considerthegivenproblem.Describetheo peratorinvolved in it. Consider the water jug problem: You aregiven two jugs, a 4-gallon one and 3-gallon one .Neitherhas any measuring marker on it. There is a pump that canbe used to fill	BTL-5	Evaluate

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	the jugs with water. How can you getexactly.		
2.	Develop your own multi – agent systems with the help ofanillustration.(15)	BTL-6	Create

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QUESTION BANK

UNIT II-PROBLEMSOLVING METHODS

Problem solving Methods - Search Strategies- Uninformed - Informed - Heuristics - LocalSearchAlgorithmsandOptimizationProblems-SearchingwithPartialObservations-ConstraintSatisfactionProblems–ConstraintPropagation-BacktrackingSearch-GamePlaying-Optimal Decisionsin Games–Alpha -Beta Pruning- Stochastic Games.

PART A

Q.NO	QUESTIONS	BTL	COMPETENCE
1.	DefineProblemFormulation.	BTL-1	Remember
2.	WhatarethefourcomponentstodefineaprobleDef in them	BTL-1	Remember
3.	Definea graph and a path.	BTL-1	Remember
4.	Discoverwhatisoptimalsolution?	BTL-3	Apply
5.	Defineabstraction.	BTL-1	Remember
6.	Rankandlistthecriteriatomeasuretheperformanceofsearchstrategies.	BTL-5	Evaluate
7.	Defineheuristics. Whyareheuristicscrucialforthe efficientdesign of an expertsystem?	BTL-1	Remember
8.	Showthesignificanceofusingheuristicfunctions.	BTL-3	Apply
9.	Generalizeanddefinetheeffectofheuristicaccuracy performance.	BTL-6	Create
10	Examinethebreadthfirstsearch.	BTL-3	Apply

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11	Summarize Simulatedannealing.	BTL-2	Understand
12.	Summarize stochasticbeamsearch.	BTL-2	Understand
13.	PointoutwhatisGeneticalgorithm.	BTL-4	Analyze
15.	Givethedefinitionofgame.	BTL-2	Understand
16.	Composewhatis best-firstsearch.	BTL-6	Create
17.	Analyze the definitionofgreedybest-first search.	BTL-4	Analyze
18.	TelltheclassificationofCSPwithrespecttoconstraints.	BTL-1	Remember
19.	Point outanddefinenodeconsistency,arc consistency andpath consistency.	BTL-4	Analyze
20.			

1.	**Compose** the process of simulated annealing with example.(15)	BTL-6	Create
2.	(i) **Develop** healgorithmforsteepesta Scenthill climbing. (ii) State the characteristics of an AI problem.	BTL-6	Create

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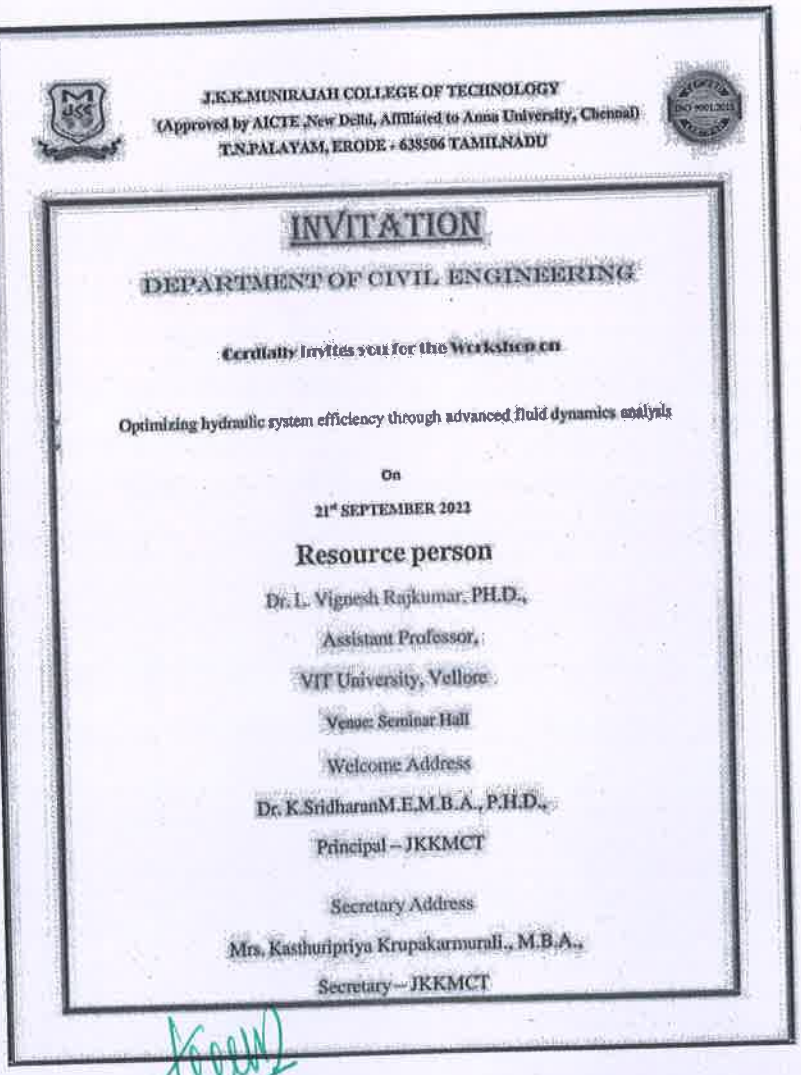
CO-CURRICULAR ACTIVITIES:-WORKSHOP DETAILS

S.NO	DATE	TITLE	RESOURCE PERSON	VENUE
1.	21.09.2022	"Optimizing Hydraulic System Advanced Fluid Dynamics Analysis"	DR.L.VIGNESHKUMAR, VIT UNIVERSITY,VELLORE	JKKMCT SEMINAR HALL

WORKSHOP INVITATION



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INVITATION

DEPARTMENT OF CIVIL ENGINEERING

Cordially invites you for the Workshop on

Optimizing hydraulic system efficiency through advanced fluid dynamics analysis

On

21st SEPTEMBER 2022

Resource person

Dr. L. Vignesh Rajkumar, PH.D.,

Assistant Professor,

VIT University, Vellore

Venue: Seminar Hall

Welcome Address

Dr. K.SridharanM.E,M.B.A., P.H.D.,

Principal – JKKMCT

Secretary Address

Mrs. Kasthuripriya Krupakarmurali., M.B.A.,

Secretary – JKKMCT

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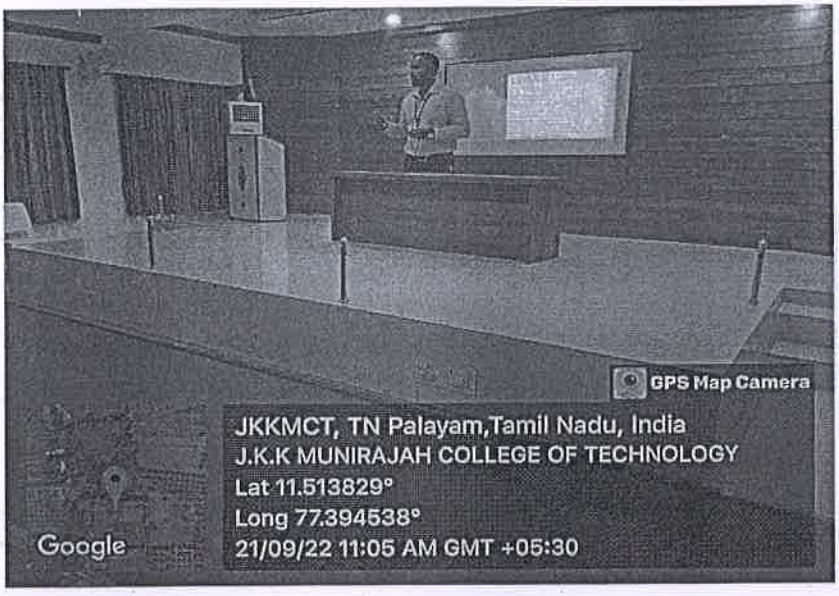
WORKSHOP EVENTS PHOTOS



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ASSIGNMENT SUBMISSION DATE SCHEDULE:

S.No	SUBJECT CODE & SUBJECT NAME	DUE DATE FOR ASSIGNMENT SUBMISSION	RESCHEDULED DUE DATE
1	CE8601 – DESIGN OF STEEL STRUCTURAL ELEMENTS	10.03.2023	13.03.2023
2	CE8602 - STRUCTURAL ANALYSIS-II	13.03.2023	15.03.2023
3	CE8603 – IRRIGATION ENGINEERING	14.03.2023	17.03.2023
4	CE8604 – HIGHWAY ENGINEERING	15.03.2023	20.03.2023
5	EN8592- WASTE WATER ENGINEERING	16.03.2023	13.03.2023

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LINKS FOR ACCESSING E-JOURNALS

S.No	E-Resources	Link –Accessibility
1	DELNET-Developing library network	http://delnet.nic.in
2	NDL-National Digital Library	https://ndl.iitkgp.ac.in/
3	SWAYAM NPTEL LOCAL CHAPTER	https://nptel.ac.in/LocalChapter/spoc_login/
4	Remote Access	https://www.k-hub.in/
5	E-books & E-Journals	https://www.k-hub.in/ and https://jgateplus.com/
6	LINKEDIN LEARNING	https://www.linkedin.com/learning/me/my-plan

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DEPARTMENT OF MECHNICAL ENGINEERIN

IMPORTANT QUESTIONS-ME8792-POWER PLANT ENGINEERING

1. Illustratethefunctionofboiler andturbine.
2. Whatarethetwobasic parametersto decidewhile planninga powerplant?
3. Whatdoyouunderstand bythetermFBC?
4. Onwhat factorsdoesthe unitsize ofapower plant depend?
5. Whatisboilerefficiency?
6. Definesupercriticalsteamcycle.
7. Whatisabackpressureturbine? Writeanytwo applications.
8. Whatispass-out turbineandwhen isitused?
9. Whatarethefunctionsofdraught system?
10. Whatdoyouunderstandbytheterm boilerdraught?
11. Classifypower plants on thebasis of traditional use.
12. DrawtheP-V, H-S,and T-SdiagramforRankine cycle.
13. WhataretheprocessesofBinary cycle?
14. Whyis hydrazineinjected atthesuctionofthe boilerfeed pump?
15. Reasonoutwhycogeneration is quiteviable in sugar industriescomparetothatinotherindustries?
16. Whatarethe requirementsofa modernsurfacecondenser?

PART-B

1.DrawtheReheatRegenerativeRankinecycleofathermalpowerplantwithP-VandT-Sdiagram.Writeitsvariousformulas

2. Explain with a neat sketch the working of a thermalelectricpowerplantstationanddiscussthefunction ofmajorcomponents init

3. Explaintheworkingprincipleofsupercriticalboilers andFBC withaneatsketcth.

4.Steamentersthehighpressureturbineat11MPaand610°Cand iscondensed in the condenser at a pressure of 9 kPa. If themoisture content of steam at the exit of low pressure turbine isnottoexceed12%.Determinepressureatwhichthesteamshouldbereheatedand thermalefficiencyof thecycle

5.Explainamodernash handlingsystemwith neatblockdiagram.

6.Explaintheprincipleinvolvedinpreparationofcoalandwhatarethe methodsofpreparation.

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7.Explainfuelhandlingsystemincoalbasedthermalpowerplantwithneatsketch.
8.(i)Explainanyone draughtsystemswitha neatsketch.
(i) Listouttheuniquefeaturesthatmakecirculatingfluidizedbedboilersmoreattractivethanot hersolidfuelfiredboilers.
9.Explaincogenerationplantwithneatsketchandalsoitsefficiency.
10.Whatdoyouunderstandbycogenerationofpowerandprocessheat?andExplainitsthermody namicadvantage.
11.Explainbrieflyvariousstepsinvolvedinwatertreatment.

12.Definebinarycycle?Explainthelayoutandoperationofthemercury-steambinary cyclepower plant?

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UNIT-I INTRODUCTION TO MECHATRONIC SYSTEMS

Introduction:

Anautomationandcontrolmethodadoptingintegratedapproachtotechnologyhasbecome relevant toindustries,machinery and consumer engineering products. Mostof thedomestic equipment like automatic washing machines, automatic cameras, digital cameras,DVD players, hard disc drives are examples of Mechatronic system which we use withoutbotheringtoknowthetechnologyadoptedinit.

Definition of Mechatronics:

Definition1:

Mechatronics maybedefinedas"thecompleteintegrationofmechanicalsystemwithelectronics,electricaland computersysteminto asingle system".

Definition2:

Mechatronicsis"thesynergistic(Together)combinationofmechanicalengineering,electronic engineering, control engineering and systems thinking in the design of productsandmanufacturingprocesses"

Example:automaticwashing machine,digitalfuelinjectionsystem,engine managementsystem.Etc.,

Multi-disciplinaryscenario:

- Mechatronicsisthesynergistic(Together)combinationofmechanicalengineering,electronicen gineering,controlengineeringandsystemsthinkinginthedesignofproductsandmanufacturing processes".
- Multi-disciplinary products are not new; they have been successfully designed and usedformanyyears.Mostcommonisthe electromechanical system.
- It employs a sequential design-by-discipline approach. For example in the design ofelectromechanicalsystemthreestages ofdesignareadopted.
- They are design of mechanical system, design of microelectronic system and controlsystem.
- Eachdesignapplication followsthecompletionofthepreviousone.

OriginofMechatronicsystem:

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- ThewordMechatronicswascoinedbyJapaneseinthelate1970"stodescribethephilosophyadoptedinthedesignofsubsystemofelectromechanicalsystems.
- ThefieldofMechatronicsreceivedtheinternationalrecognitionsonlyinthelastfewyears.
- Thefieldhasbeenderivedbyrapidprogressinthefieldofmicroelectronics.
- AtR&Dlevelthe followingareashavebeenrecognizedunderMechatronics discipline.

a) Motioncontrolactuatorsandsensors
b) Micro devicesandoptoelectronics
c) Robotics
d) Automotivesystems
e) Modelinganddesign
f) Systemintegration
g) Manufacturing
h) Vibrationand noisecontrol.

Evaluation of Mechatronics:

Primary level Mechatronics(first)

a. SecondarylevelMechatronics(second)
b. TertiarylevelMechatronics(third)
c. QuaternarylevelMechatronics(fourth)

a. PrimarylevelMechatronics(first):

- In theearly days Mechatronics products wereat primary level containingI/Odevices suchas sensors, and actuators that integrated electrical signals with mechanical action at the basiccontrollevel.

Examples:electricallycontrolledfluidvalvesand relays

b. SecondarylevelMechatronics (second):

- Thislevelintegratesmicroelectronicsinto electricallycontrolleddevices.

Examples:cassetteplayer.

c. TertiarylevelMechatronics(third):

- Thisincorporatesadvancesfeedbackfunctionsintocontrolstrategy,therebyenhancingthequality in

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terms of sophistication.

- Mechatronicssystematthisleveliscalled'smartsystem'.
- Thecontrolstrategyincludesmicroelectronics,microprocessorandother,,applicationspecificintegratedcircuits"(ASIC).

Examples: DVDplayer,CDdrives,automaticwashingmachine,CDdrives,etc.

d. QuaternarylevelMechatronics(fourth):

ThislevelincludesintelligentcontrolinMechatronicssystem.

Thelevelattemptstoimprovesmartnessastepaheadbyintroducingintelligenceandfaultdetectionandisolation(FDI)capabilitysystem.

Examples:artificialneuralnetworkandfuzzylogictechnologies

AdvantagesanddisadvantagesofMechatronics:

Advantages:

1. Theproductsproducedarecosteffectiveandverygoodquality.
2. Highdegreeofflexibility
3. Greaterextentofmachineutilization
4. Greaterproductivity
5. Highlifeexpectedbypropermaintenance.
6. Theintegrationofsensorandcontrolsystemina complexsystemreducescapitalexpenses.

Disadvantages:

1. Higherinitialcostofthesystem.
2. ImperativetohaveKnowledgeofdifferent engineering fieldsfordesignandimplementation.
3. ItisexpensestoincorporateMechatronicsapproachestoexisting/oldsystems.
4. Specificproblemofvarioussystemswillhavetobeaddressedseparatelyandproperly.

CharacteristicsofMechatronicsystem:

1. Highqualityproduct.
2. Safe.

Applications of Mechatronic systems:

Theareasare:

1. Automotivemachines.

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2. Faxandphotocopiermechanics
3. Dishwashers.
4. Automaticwashingmachine
5. Airconditioners,elevatorcontrols.
6. Documentsscanners
7. ICmanufacturingsystems.
8. Roboticsemployedinwelding,nuclearinspection,paintingetc.,
9. VCRsandCDPlayers.

Generalizedmeasurementsystem:

Generallyameasurementsystemconsistsof3basicelements.

1. Sensor/transducer.
2. Signalconditioner.
3. Display/readoutdevices.

Inadditiontotheabove,electricalpowerisalsorequired.

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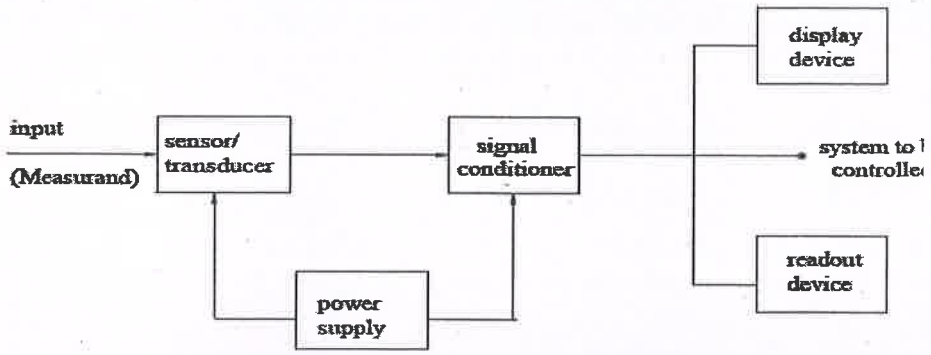
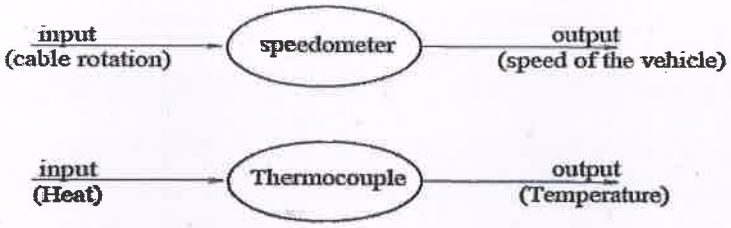


figure: block diagram of generalised measurement system



Functions of each elements of measurement system:

Sensor/transducerunit:

- Theheartofanymeasurementor controlsystemissensor/transducer.
- Sensor/transducerisadeviceitconvertstheoneformofenergytoanotherform.
- Sensor/transduceritsensesthephysicalphenomenontobemeasureandtransformitfrom one formtoanotherform(generallyelectricalform).
- Theoutputofthisunitis inputtothesignalconditionerwhichis nextelement

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UNIT VICE 2 AND 16 MARKS- ME8593DESIGN OF MACHINE ELEMENTS

UNIT-I STEADY STRESSES AND VARIABLESTRESSES IN MACHINE MEMBERS

PART-A (2 marks)

1. Define: "Design" 2. What is 'Adaptive design '? Where is it used? Give examples.
3. What are the various phase of design process?
4. List some factors that influence machine design.
5. Define: "Optimization"
6. Define Principal plane, principal stress
7. Give examples for curved beams
8. Why normal stress theory is not suitable for ductile materials?
9. Define stress concentration and stress concentration factor. , 10 Define: "Factor of safety" 11. How is factor of safety defined for brittle and ductile materials?
12. What are the various factors to be considered in deciding the factor of safety?

UNIT-II (STEADY STRESSES AND VARIABLESTRESSES IN MACHINEMEMBERS)

PART -B

1. (a) A piston of a reciprocating compressor has a diameter of 60mm. The maximum pressure on the piston fall is 1.25MN/m

2 .Assuming the gudgeon pin passing through the small end of the connecting rod can be safely loaded in shear up to 10MN/m (a) Explain with mathematical expressions.Maximum principal stress theory and Von-Mises-Henky theory

2. (a) Determine the diameter of the steel bar, which is a ductile in a nature subjected to an axial load of 60KN and torsional moment of 1600N-m.Use the factor of safety 2.5.E=200GPa.

(b) Explain with mathematical expressions. Maximum shear theory and Venant's theory

3. A steel member is subjected to a 3-D stress system and resulting principal stress are 120N/mm, tension, 80N/mm2and 40N/mm2 compression. If the proportional limit of the material in simple tension is 280N/mm 2and its poison'sratio is O.

4. A bolt is subjected to a tensile load of 25KN and a shear load of 10KN. Determine the diameter of the bolt according to (a) Maximum principal stress theory (b) Maximum principal strain theory (c) Maximum shear stress theory. Assume factor of safety 2.5, Yield point stress in simple tension 300N/m

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5.Taking stress concentration in to account find the maximum stress induced when a tensile load of 20KN is applied to (i) A rectangular plate 80mm wide and 12mm thick with a transverse hole of 16mm diameter.(ii)A stepped shaft of diameters 60mm and 30mm width a fillet radius of 6mm.

UNIT -III (DESIGN OF SHAFTS, KEYS AND COUPLINGS)

PART-A (2 marks)

1. What is a shaft?
2. Write down the formula for finding
3. What is a key?
4. What are the types of keys?
5. Differentiate between keys and splines.
6. What is the function of a coupling between two shafts?
7. What are flexible couplings used?
8. What is the material used for flange or flange coupling?

UNIT -II (DESIGN OF SHAFTS, KEYS AND COUPLINGS)

PART-B

1. A line shaft rotating at 200rpm is to transmit 20KW power. the allowable shear stress for the shaft material is 42N/mm2.Ifthe shaft carries a central load of 900N and is simply supported between bearing 3meters apart determine the diameter of the shaft. The maximum tensile or compressive stress is not to exceed 56N/mm
2. An electric generator rotates at 200rpm and receives 300KW from the driving engine. The armature of the generator is 60cm long and located between bearing 120cm center to center. Owing to the combined weight of armature and magnetic pull, the shaft is subjected to 9000kg acting at right angles to the shaft. The ultimate stress for the shaft is 4480kg/cm2 and shear stress is 3920kg/cm2.Find the diameter of the shaft for a FOS.
3. A shaft to transmit 50KW at 1200rpm.It is also subjected to a bending moment of 275NNm.Allowable shear stress is 60N/mm^2. The shaft is not to twist more than 20 in a length of 2 m. G=80XI03N/mm^2

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ME8501-METROLOGY AND MEASUREMENTS

Reg.No.:

QuestionPaperCode:40831

B.E./B.TechDEGREEEXAMINATIONS,NOVEMBER/DECEMBER2021.

FifthSemesterMechanicalEngineering

ME8501–METROLOGYANDMEASUREMENTS

(Regulations2017)

Time:ThreehouMaximum Marks :100

AnswerALLquestions.

PARTA—(10×2=20marks)

1. Howdoes'person'asafactorinfluencetheresultsofameasurement?
2. Discussthebasisofselectingastandardforaparticulartypeofmeasurement?
3. Writeshortnoteson'Ringguages'.
4. Whatisselectiveassembly?
5. Whatistheadvantageofusingpolarizedbeamsplitteroverordinaryglassbasedbeamsplitter?
6. Mentionabouttheusesofvarioustypesofprobesusedin CMMs.
7. Listoutthedifficultieswitnessedinthemeasurementofflatnessofasurface.
8. Briefontheeffectofstylusandskidinmeasurementofsurfaceroughness.
9. Whataretheusesofaforcetransducer?
10. Define'Reliability'.

PARTB—(5×13=65marks)

11. (a) Brieflyexplaintheelementsofameasurementsystem (13)

Or

(b)Explainvarioustypesoferrorsthatoccurinengineeringmeasurements. (13)

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12. Explaintheconceptofinterchangeabilityappliedtoindustries. (13)

Or

13. (a)Explainvariouscasesofapplicationofsinebarswithneatdiagrams. (13)

(b)Explainwithcasestudiestheuseoflaserinterferometersforlinearandangular measurements. (13)

14. a)Describe various Industrial applications of CMMs with sketcheswhereverneeded. (13)

Or

(b) Explaintheprocedureforfindingthechordalthicknessofagearusingagear toothverniercaliper(13)

15. (a) Describevariouscomparisonmethodsofsurfaceassessment. (13)

Or

(b) Explainanytwotypesofflowmeterswithneatdiagramsstatingtheiradvantagesanddisadvantages. (13)

PARTC—(1×15=15marks)

16.(a) Elaborateontheimportanceofroughnessandwavinessincontexttovariousengineering applications. (15)

Or

(b)Explainthescopeofmachinevisioninablottingplantwithsuitablesketches (15)

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B.E./B.Tech.DEGREEEXAMINATIONS,NOVEMBER/DECEMBER2020

FifthSemesterMechanicalEngineering

ME8501–METROLOGYANDMEASUREMENTS

(Regulations2017)

Time:ThreeHours **Maximum: 100Marks**

AnswerALLquestions

PART–A (10×2=20Marks)

1. Distinguish Precision and Accuracy.
2. Definegrasserror.
3. Givethevarioustypesoflinearmeasuringinstruments.
4. Writeanyfourprecautionstobefollowedwhenusingslipgauges.
5. Whatismeantbyalignmentteston Machinetools?
6. Why thelaseris usedinalignment testing?
7. Whataretheapplicationsoftoolmakersmicroscope?
8. DefineConstantChord.
9. Writetheworkingprinciple ofOrificemeter.
10. Listvarioustypesoftemperaturesensors.

PART–B(5×13=65Marks)

11. a) Explaintheclassificationofvariousmeasuringmethods. (13)

(OR)

b) Explainthevarioussystematicandrandomerrorsinmeasurements. (13)

12 a)Withneatsketchexplaintheworkingprincipleofmicroopticauto collimator. (13)

(OR)

b) Explainthe following with neatsketch.

i) Sinebar ii) BevelProtractor. (7+6)

13. a)ExplaintheworkingprincipleofACLASERinterferometerand how thestraightnessis measured.(13)

(OR)

b) Withneatsketchexplainthevarioustypesof CMMbasedonitsconstruction.Alsowritetheadvantages

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ofcomputeraidedinspection

14 a)Describea gear toothVernier Caliper and explainits use for checkingtooth thicknesanddepthoftooth. (13)

OR)

b)Derivetheformulaformeasuringtheeffectivediameterofthreadby3-wiremethod withneatsketch. (13)

15. a)Withneatdiagramexplaintheconstructionandworkingprincipleofthefollowing:
i) PitotTube ii) Venturimeter(6+7)

(OR)

b)Withneatdiagramexplaintheconstructionandworkingprincipleofthefollowing:
i)Thermocouple ii) Bi-Metallicstrip .(7+6)

PART–C(1×15=15Marks)

16a)DesigngeneraltypeGOandNOGOgaugesfora40H7/d8fit.40mmliesinthe iameter30to50.Showgraphicallythedispositionofgaugetolerancezonesrelativetotolerance zones.Standard tolerancefor IT7 is16i andIT8 i,where'I'isthetoleranceunit.Theupperdeviationfor'd'shaftis-16$D^{0.44}$.(15)

(OR)

b)An electronic caliper was used to measure the length of an object. Fivemeasurementsweremade.Theresultsofthefivemeasurementsare:21.53mm21.51 mm, 20.52 mm, 21.48 mm and 21.42 mm. The workshop temperatureduringmeasurementwas21°C.Thecalibrationcertificateoftheelectroniccaliper says that the device will read within ± 0.02mm of the correct answer ifit is used correctly and when the temperature is within 0 to 40°C. Estimate thexpanded uncertainty at acoverage factor of2 providing coverageprobabilityofapproximately95%. (15)

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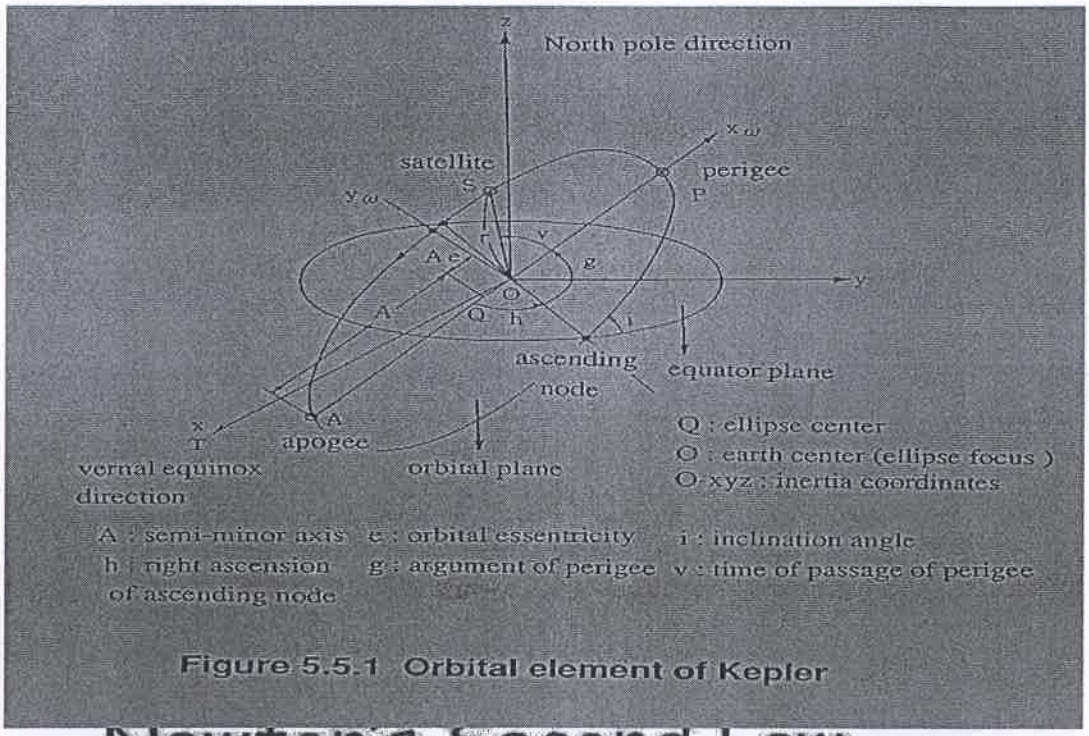

Figure 5.5.1 Orbital element of Kepler

Newton's Second Law

An unbalanced force causes an object to accelerate. The acceleration of the object is equal to the net force acting on it divided by the object's mass.

Unbalanced Forces in the Same Direction
When two forces act in the same direction, the net force is the sum of the two individual forces. The box moves to the right.

Unbalanced Forces in the Opposite Direction
When two forces act in opposite directions, the net force is the difference between the two individual forces. The box moves to the right.

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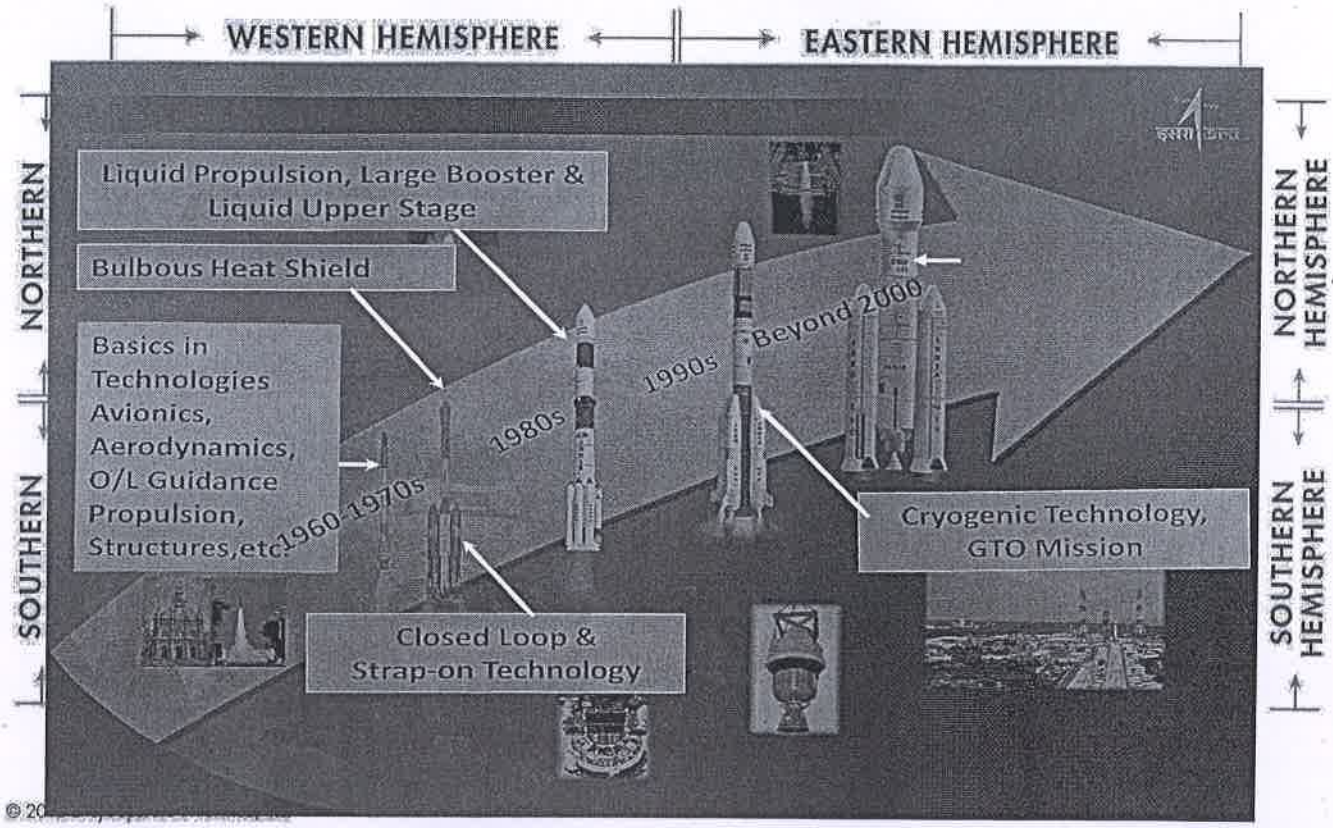
LookAngleDeterminations



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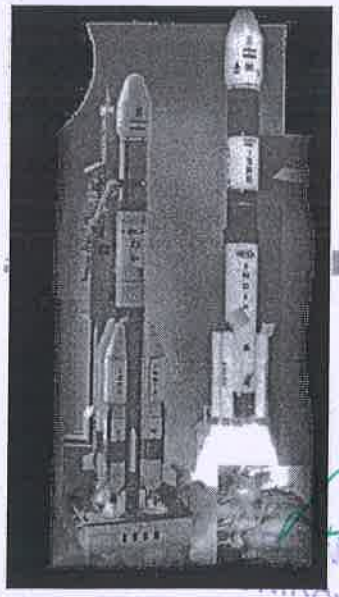

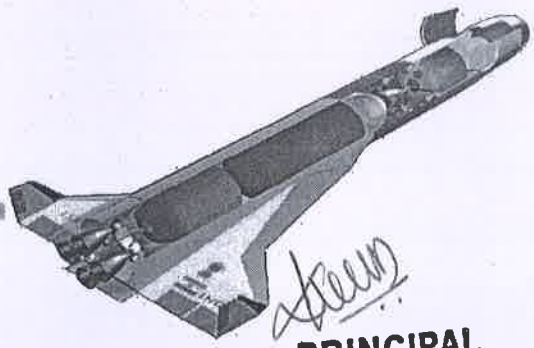

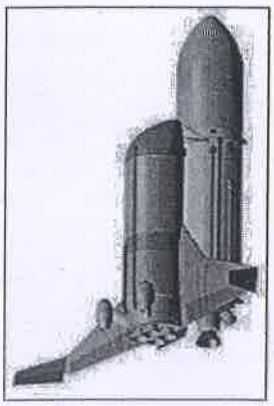

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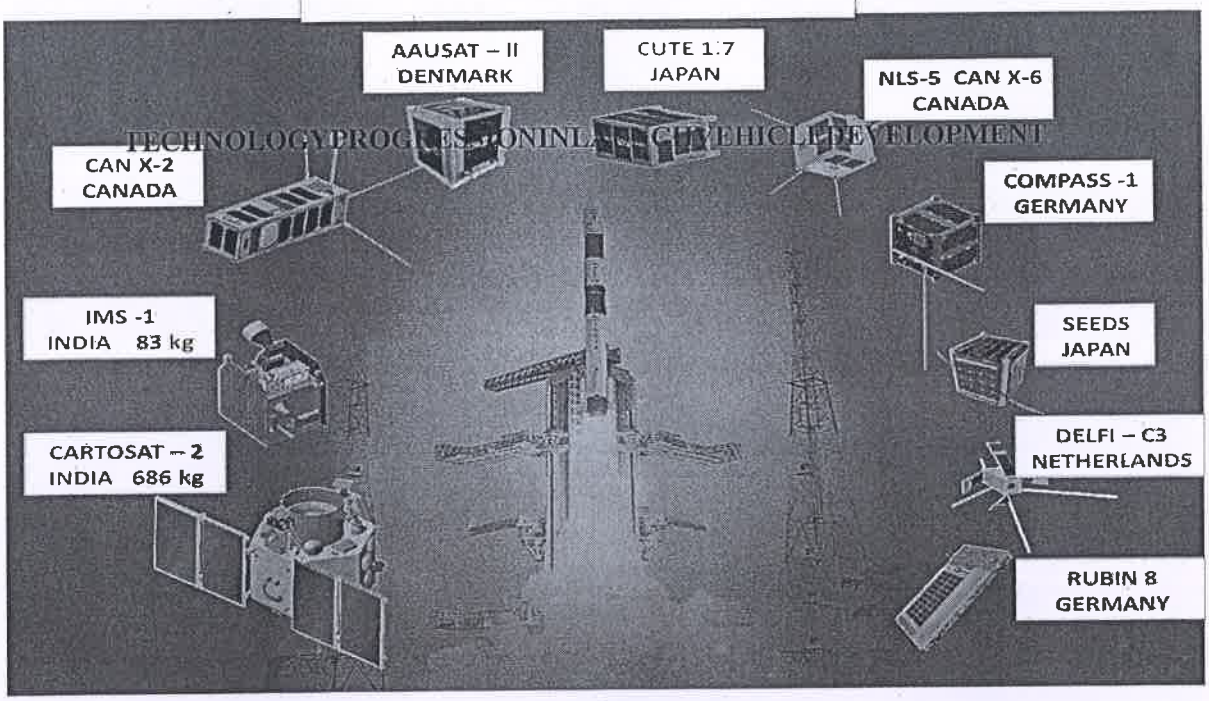

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EC8095-VLSI DESIGN QUESTION BANK

UNIT–IMOSTRANSISTORPRINCIPLE

Definethresholdvoltage ofaMOSFET.

The threshold voltage of a MOSFET is usually defined as the gate voltage whereaninversion layerformstheinterfacebetween theinsulatinglayer(oxide)andthesubstrate(body)ofthetransistor.

1. WhatisenhancementmodeFET?

   A type of FET in which there are no charge carriers present in the channel, whenthe gate voltage is in zero. In these devices, the increasing the gate voltage will increasesthecurrentflowfromsourcetodrain.

2. Whatspecificationsyouwillconsiderforselectinga MOSFET?
   1. Breakdownvoltages
   2. Forwardtransconductance
   3. Drainsourceonresistance(R_{ds})
   4. Switchingcharacteristics
   5. Zerogatevoltagedraincurrent(I_{dss})
   6. Inputcapacitance(C_i)

3. Whatarethestepsperformedtoachievelithographyfriendlydesign?
   1. Checkingthe layoutconfirmingthe designrules(spacing,tracewidth,shorts).
   2. Checkforthelesscongestedareasandincreasingthespacingofthenets.

4. Statedifferenttypesofoxidation.
   1. Dryoxidation
   2. Wetoxidation
5. GivethemajoradvantagesofIC.
   1. Sizeisless
   2. Highspeed
   3. Lesspowerdissipation.
6. Whataredifferentgenerationsofintegrationcircuits?
   1. SSI(SmallScaleIntegration)
   2. MSI(MediumScaleIntegration)
   3. LSI(LargeScaleIntegration)
   4. VLSI(VeryLargeScaleIntegration).

7. Givethevarietyofintegratedcircuits(ICs).
   1. MoreSpecializedCircuits(MSC).
   2. ApplicationSpecificIntegratedCircuits(ASICs).
   3. SystemsonChips(SOC).

hatarethevarioussiliconwaferpreparations?

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4. Crystalgrowthanddoping
5. Ingottrimmingandgrinding
6. Ingotslicing
7. Waferpolishingandetching

8. WafercleaningatarethedifferentterminalsinMOStransistors?
   1. Drain
   2. Source
   3. Gate.
9. What isdepletionmode operationMOS?
   Ifthe channelisinitiallydopedlightlywithp-type impuritya conductingchannelexistsatzerogatevoltageandthedeviceissaidtooperateindepletionmode.

10. WhatisenhancementmodeoperationofMOS?
    If the gate field must induce a channel before current can flow and the gate voltageenhancesthechannelcurrentandsuchadeviceissaidtotheenhancementmodeMOS.

11. StatethedifferenttypesofCMOSprocesses.
    1. p-wellprocess
    2. n-wellprocess
    3. Silicononinsulatorprocess
    4. Twintubprocess.
12. Whatarethestepsinvolvedintwintubprocess?
    1. Tubformation
    2. Thinoxideconstruction
    3. Sourceanddrainimplantation
    4. Contactcutdefinition
    5. Metallization.
13. What islatchup?
    Latchupisaconditioninwhichtheparasiticcomponentsgiverisetotheestablishmentoflowresistanc econductingpathsbetweenVDDandVSSwithdisastrousresults.Carefulcontrolduringfabrication isnecessarytoavoidthisproblem.
14. Whatisstickdiagram?
    It is used to convey information through the use of color code. Also it is the cartoonofachip layout.
15. Whataretheuses ofstickdiagram?
    1. Itcanbedrawnmucheasierandfasterthanacomplexlayout.
    2. Theseareespeciallyimportanttoolsforlayoutbuiltfromlargecells.
16. Givethevariouscolorcodingusedinstickdiagram.Green - n-diffusion
    Red - Polysilicon
    Blue - Metal Yellow-Implant Black- Contactareas.
17. Whataretheadvantagesofsilicononinsulator(SOI)process?
    1. Nolatch-up
18. Duetoabsenceofbulks
    transistorstructuresaredenserthanbulksilicon.StatetheadvantagesofCMOSprocess.
    1. Lowpowerdissipation
    2. Highpackingdensity

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3. Bidirectionalcapability
4. Lowinputimpedance
5. Lowdelaysensitivitytoload.

19. Whatareshortchanneldevices?

Transistors with channel length less than 3 - 5 microns are termed as short channeldevices. With short channel devices the ratio between the lateral and vertical dimensionsarereduced.

20. StatethedifferentoperatingregionsforanMOStransistor.
    1. Cut-offregion
    2. Non-saturatedregion
    3. Saturatedregion.

21. DefinethresholdvoltageofCMOS.

Thethresholdvoltage, $V_t$foraMOStransistorcanbedefinedasthevoltageappliedbetweenthegate andthesourceoftheMOStransistorbelowwhichthedraintosourcecurrent, I_{DS}effectivelydrops tozero.

22. Whatisbodyeffect?

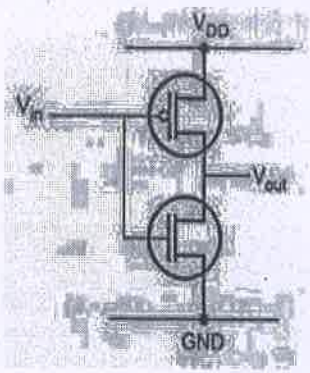
The threshold voltage V_T is not a constant with respect to the voltage differencebetween the substrate and the source of MOS transistor. This effect is called substrate -bias effector bodyeffect.

23. Whatischannellengthmodulation?

Thecurrentbetweendrainandsourceterminalsisconstantandindependentoftheappliedvoltageo vertheterminals.Theeffectivelengthoftheconductivechannelisactuallymodulatedbytheapplie dvoltage V_{DS},increasing V_{DS}causesthedepletionregionatthedrainjunctiontogrow,reducingth elengthoftheeffectivechannel.

24. WhyNMOStechnologyispreferredthanPMOStechnology?

NchanneltransistorshavegreaterswitchingspeedwhencomparedtoPMOStransistors.**Drawthe basicCMOSinvertercircuit.**



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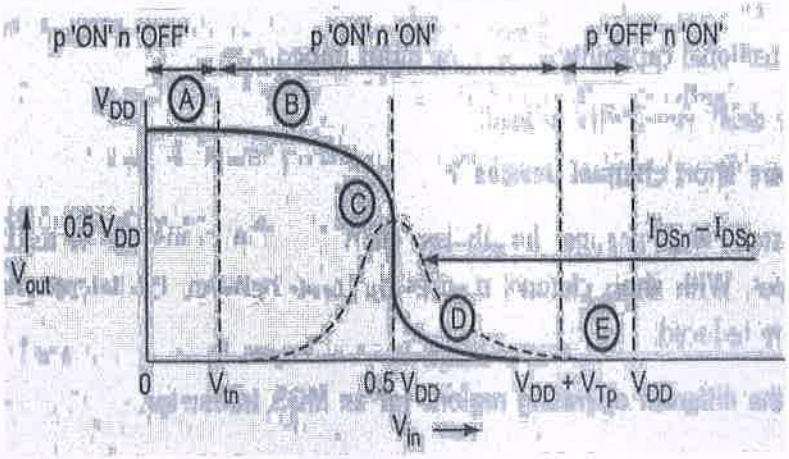
25. GivetheCMOSinverterD.C.transfercharacteristicsandoperatingregions.



26. ComparePMOSandNMOS

PMOS	NMOS
CurrentconductionisduetotheHoles	Currentconductionisduetotheelectrons
Lessswitchingspeedduetolowermobility ofholes	Higherswitchingspeedduetogreater mobilityofelectrons
Transistorwidthishigher	Transistorwidthislower
PMOStransistorshavegreaterresistance generallyintherangeof2R-3R.	Ithaslowerresistancebecauseofits reducedtransistorwidth.

UNITIICOMBINATIONALLOGICCIRCUITS

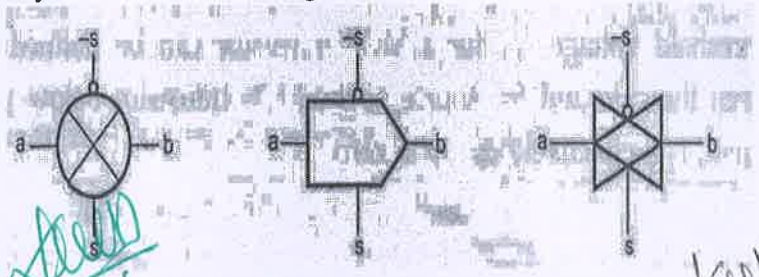
1.What is apulldowndevice?

A device connected so as to pull the output voltage to the lower supply voltageusually0 V iscalled pulldowndevice.

2.What ispullupdevice?

A device connected so as to pull the output voltage to the upper supply voltageusually VDDiscalled pullup device.

3.Givethedifferentsymbolsfortransmissiongate.



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4. Whatismeanbypowerandpowerdissipation?

Power is the rate at which energy is delivered or exchanged; power dissipation is therate at which energy is taken from the source (VDD) and converted into heat (electricalenergyisconvertedintoheatenergyduringoperation).

5. WhatismeanbyPDP?

Power delayproduct(PDP)= P_{av}* t_p=($C_L V_{DD}^2$)/2
PDPisthe averageenergyconsumedperswitchingevent(watts*sec=joule).

6. WhatisEDP?

Energydelayproduct (EDP)=PDP*t_p=P_{av}*t_p^2
EDPistheaverageenergyconsumed multiplied bythecomputationtimerequired.

7. Whataretwotypesofpowerdissipation?

- Staticdissipationduetoleakagecurrentorothercurrentdrawncontinuouslyfr omthepowersupply.
- Dynamicdissipationdueto
  - Switchingtransientcurrent.
- Charginganddischarging ofloadcapacitances.

8. Defineelmoredelaymodel.

Itisananalyticalmethodusedtoestimatethe RCdelayinanetwork.Elmoredelaymodelestimates thedelayofaRCladderasthesumovereachnodeintheladderoftheresistance R_{n-1} betweenthat nodeandasupply multipliedbythecapacitoronthenodes.

9. Whatarethegeneralpropertiesofelmoredelaymodel?Gen eralpropertyofElmoredelay modelnetworkhas

Singleinputnode
Allthecapacitorsarebetweenanodeandground Net workdoesnotcontainanyresistiveloop

10. Whatisstaticpowerdissipation?

Thepower dissipation dueto leakagecurrentwhentheMOStransistorisin idlestateis calledthestaticpower
dissipation.StaticpowerduetoSubthresholdconductionthroughOFFtransistors Tunnelingcurrentt hroughgateoxide Leakagethroughreversebiaseddiodes Contentioncurrentinradioedcircuits.

11. Whatisdynamicpowerdissipation?

Power dissipation is due to circuit switching to charge and discharge the output loadcapacitanceataparticularnodeatoperatingfrequencyiscalleddynamicpowerdissipation.

TheDynamicpowerdissipationataparticularoutputnodeisgivenby P_d=$C_L V_{dd}^2 F_{cl}$ k. A

Where,C_L=Loadcapacitance
A=Activityfactor
V_{dd}=Power supply
F_{clk}=Operatingfrequency

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12. Whatarethemethodsavailabletoreduce dynamicpowerdissipation?
    1. Reducingtheproductofcapacitanceanditsswitchingfrequency.
    2. Eliminatelogicswitchingthatisnotnecessaryforcomputation.
    3. ReduceactivityfactorReducesupplyvoltage

13. Whatarethemethodstoreducestaticpowerdissipation?
    1. By selecting multi threshold voltages on circuit paths with low-V_t transistors whileleakageonotherpathswithhigh-$V_t$transistors.
    2. Byusingtwooperating modes, activeand standbyfor eachfunctionblocks.
    3. By adjusting the body bias (i.e) adjusting FBB (Forward Body Bias) in active mode toincreaseperformanceandRBB(ReverseBody Bias)instandby modetoreduceleakage.
    4. By using sleep transistors to isolate the supply from the block to achieve significantleakagepower savings.

14. Whatisshortcircuitpowerdissipation?

During switching, both NMOS and PMOS transistors will conduct simultaneouslyandprovideadirectpath between VDD to groundresultingin shortcircuit powerdissipation.

15. Definedesignmargin.

Theadditionalperformancecapabilityaboverequiredstandardbasicsystemparameters that may be specified by a system designer to compensate for uncertainties iscalled design margin. Design margin required as there are three sources of variation twoenvironmentalandonemanufacturing.

16. Writetheapplicationsoftransmissiongate?M
    ultiplexingelementof pathselector
    Alatchelementanunlockswitch
    Actasavoltagecontrolledresistorconnectingtheinputand output.

17. Whatispasstransistor?

It is a MOS transistor, in which gate is driven by a control signal, when the controlsignal is high, input is passed to the output and when the control signal is low, the outputis floatingtopologysuchtopologycircuitsis called pass transistor.

18. Listtheadvantages ofpasstransistorlogic.

Passtransistorlogic
circuitsareoftensuperiortostandardCMOScircuitsintermsoflayoutdensity,circuitdelayand powerconsumption.
TheydonothavepathVDDtoGNDanddonotdissipatestandbypower(staticpowerdissipation).

19. Whatistransmissiongate?

ThecircuitconstructedwiththeparallelconnectionofPMOSandNMOSwithshorted drain and source terminals. The gate terminal uses two select signals s and , whens is high than the transmission gate passes the signal on the input. The main advantage oftransmissiongateis thatiteliminates thethresholdvoltagedrop.

20. Whylowpower hasbecomeanimportantissue

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intheVLSIcircuitrealization?Increasingtransistorcount:
Thenumber oftransistorisgettingdoubledinevery18monthsbased onmoore'slaw Higher speedof operation:
Thepowerdissipationisproportionaltoclockfrequenc
yGreater deviceleakagecurrent:
In nanometer technology the leakage component become a significant percentage ofthe total power and the leakage current increases at a faster rate than dynamic power intechnologygenerations.

21. Whatarethevarious ways toreducethedelaytimeofaCMOS inverter?
    1. ThewidthoftheMOStransistorcanbeincreasedtoreducedelaythisisknownasgatesizing, whichwillbediscussed laterinmoredetails.
    2. The load capacitance can be reduced to reduce delay this is achieved by usingtransistor ofsmallerandsmallerdimensionbyfeaturegenerationtechnology.
    3. DelaycanalsobereducedbyincreasingthesupplyvoltageV_{DD}andreducingthethresholdv oltage$V_t$oftheMOS transistors

22. Explainthebasicoperationofa2-phasedynamiccircuit.
    The operation of the circuit can be explained using pre-charge logic in which theoutput is pre-charged to HIGH level during Φ_2 clock and the output is evaluated during$\Phi_1$clock.

23. WhatmakesdynamicCMOScircuitsfasterthanstaticCMOScircuits?
    AsMOSdynamiccircuitsrequirelessernumberoftransistorsandcapacitanceistobedrivenbyit.This makesMOSdynamiccircuitsfaster.

24. Whatisglitchpowerdissipation?
    Because of finite delay of the gates used to realize the Boolean functions, differentsignals cannot reach the inputs of a gate simultaneously thisleads to spurious transitionat the output before it settles down to its final value, the spurious transitions leads tochargingand dischargingoftheoutputscausingglitchpowerdissipation

.UNITIII SEQUENTIALLOGICCIRCUITS

1. What ismetastabilityandlistthestepstoprevent it?
   Metastability is an unknown state it is neither zero nor one. Metastability happensfor the design systems violating setup or hold time requirements. Setup time is arequirement that the data has to be stable before the clock edge and hold time is arequirement thatthedatahastobe stable afterthe clockedge.Thepotentialviolationofthe setup and hold violation can happen when the data is purely asynchronous andclockedsynchronously. Steps topreventmetastability:
   1. Using proper synchronizers (two stage or threestage), as soon as the data iscomingfromtheasynchronousdomain.Usingsynchronizers,recoversfromthemetastableev ent.
   2. Use synchronizers between cross-clocking domains to reduce the possibility frommetastability.
   3. Usingfasterflipflops(whichhasnarrowermetastablewindow).

2. Definelocal-skew,global-skew,anduseful-skew.Localskew:

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Thedifferencebetweenthe clockreachingatthe launchingflip-flopvsthe clockreachingthedestinationflip-flopofatiming-path.

Globalskew:

The difference between the earliest reaching flip-flop and latest reaching flip-flop forasameclock-domain.

Usefulskew:

Useful skew is a concept of delaying the capturing flip-flop clock path, this approachhelps in meeting setup requirement within the launch and capture timing path. But theholdrequirementhas tobemetfor thedesign.

3. Whatismeantbyvirtualclockdefinitionandwhyitisneeded?

Virtual clock is mainly used to model the I/O timing specification. Based on whatclocktheoutput/inputpads arepassing thedata.

4. What isthedifference betweenmealyandmoorestatemachines?

In the mealy state machine we can calculate the next state and output both from theinput and state. But in the moore state machine we can calculate only next state but notoutput fromtheinputandstateandtheoutputisissuedaccordingtonextstate.

5. Whatisthedifferencebetweenlatchesandflip-flopsbaseddesigns?

Latches are level-sensitive and flip-flops are edge sensitive. Latch based design andflop based designis thatlatch allows timeborrowing which atradition flip-flopdoesnot: That makes latch based design more efficient. But at the same time, latch baseddesignis morecomplicatedandhasmoreissues inmintiming(races).

6. Whatarethe classificationsofCMOScircuitfamilies?StaticC MOS circuits.

DynamicCMOScircuits.
Ratioed circuits.Pass-transistorcircuits.

7. WhatarethecharacteristicsofStaticCMOSdesign?

A static CMOS circuit is a combination of two networks, one is pull-up network(PUN) and the other is pull-down network (PDN) in which at every point in time, eachgateoutputis connectedtoeitherVDD orVSS viapull-uporpulldownnetwork.

8. Listtheimportantproperties ofStaticCMOSdesign.

1. Atanyinstant oftime,theoutputofthegateisdirectlyconnectedtoVDD andVSS.
2. ThefunctionofthePUNisprovidingaconnectionbetweentheoutput andVDD.
3. ThefunctionofthePDNisprovidingaconnectionbetweentheoutput andVSS.
4. Both PDN and PUN are constructed in mutually exclusive way such that one andonly one of the networks is conduct in steady state. That is, the output node isalways alow-impedancenodeinsteadystate.

9. WhatisDynamicCMOSlogic?

Dynamic circuits rely on the temporary storageof signal valueson the capacitanceofhighimpedancenode.ItrequiresonlyN+2transistors.Ittakesasequenceofprecharge andconditionalevaluationphasestorealizethelogicfunctions.

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10. Whatarethepropertiesofdynamiclogic?
    1. Logicfunctionisimplementedbypull-down networkonly.
    2. Fullswingoutputs (V_{OL}=GND andV_{OH}=VDD).
    3. Non-ratioed.
    4. Fasterswitchingspeeds.
    5. Needsaprechargeclock.

11. WhatarethedisadvantagesofdynamicCMOStechnology?
    A fundamental difficulty with dynamic circuits is a loss of noise immunity and aserioustimingrestrictionontheinputsofthegate.Violatemonotonicityduringevaluationphase.

12. WhatisCMOSDominologic?
    AstaticCMOSinverterplacedbetweendynamicgateswhicheliminatethemonotonicityproblemin dynamiccircuits arecalledCMOS Dominologic.

13. Whatiscalledstaticanddynamicsequencingelement?
    A sequencing element with static storage employs some sort of feedback to retain itsoutputvalueindefinitely.Asequencingelementwithdynamicstoragegenerallymaintains its value as charge on a capacitor that will leak away if not refreshedforalongperiod oftime.

14. Whatisclockskew?
    Inrealityclockshavesomeuncertaintyintheirarrivaltimes thatcancutintothetimeavailablefor usefulcomputation. Itis called clockskew.

15. Whataresynchronizers?
    Synchronizersareusedtoreducemetastability.
    Thesynchronizersensuresynchronizationbetweenasynchronousinputandsynchronous system.

16. DifferencebetweenlatchesandFlip-Flop.

S.No	Latch	Flip-Flop
1.	ALatchisLevelSensitive	Aflip-flop isedgetriggered.
2.	A latchstores whentheclock levelis lowandistransparentwhenthele velishigh.	Aflip-flop stores whentheclock risesandismostlynevertransp arent.

17. DefinePipelining.
    Pipelining is a popular design technique often used to accelerate the operation of thedata path in digital processors.The majoradvantages of pipeliningare to reduce glitchincomplexlogicnetworksandgettinglowerenergyduetooperandisolation.

18. HowthelimitationsofaROMbasedrealizationisovercomeinaPLAbasedrealization.
    InaROM,theencoderpartisonlyprogrammableanduse of ROMstorealize
    Boolean functions is wasteful in many situations because there is no cross-connect for asignificant part. This wastage can be overcome by using Programmable Logic Array(PLA),whichrequiresmuchlesser chip area.

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19. DefineLatch/flip-flopclock-to-Qpropagationdelay.
TPLH:50%triggeringedgepointoftheclockpulseto50%transitionoftheoutputfromlow tohigh.
tPHL:50%triggeringedgeoftheclockpulsetothehightolow transitionoftheoutput.

20. DefineLatch/flip-flopclock-to-Qcontaminationdelay.
Outputsignalstarttochangeafteritsinputchangeandsettlestothefinalvaluewithinpropagation delay.

21. Whatisstatic0hazard?
Outputgoesmomentarily1whenitshouldremainat0iscalledstatic0hazard.

22. Whatisdynamichazard?
Outputchanges3ormoretimes whenitchanges from1to0or0to1

23. Whatisnoncriticalrace?
Finalstablestatedoes notdependontheorderinwhichthestatevariablechangesthenthatraceiscallednoncriticalraceanditi snotharmful

24. What iscriticalrace?
Finalstablestate dependsontheorderinwhichthestatevariablechangesthenthatraceconditioniscalledcriticalraceanditis harmful.

25. Definepropagationdelayandcontaminationdelay?
Propagation delay: The amount of time needed for a change in a logic input to result in apermanent change at an output that is the combinational logic will not show any further

outputchangeContamination delay: The amount of time needed for a change in a logic input to result in aninitial change at an output, that is the combinational logic is guaranteed not to show anyoutputchangeinresponsetoaninputchangebeforefedtimeunitshavepassed.

26. DefineSetuptimeandHoldtime.
Setuptime(t_{setup}):Theamountoftimebeforetheclockedgethatdatainput D mustbestabletherising clockedgearrives.

Hold time (t_{hold}): Thisindicates the amountof timeafter the clock edge, the datainput D must be held stable in order for Flip Flop to latch the correct value. Hold time isalways measuredfromtherisingclockedgetoapointaftertheclockedge.

27. DifferentiateDRAMsfromSRAMs.
Both SRAMs and DRAMs are volatile in nature, ie. Information is lost if power lineis removed. However SRAMs provide high switching speed, good noise margin butrequirelargechip areathanDRAMs.

28. Explainthereadandwrite operationsfora onetransistorDRAMcell.
A significant improvement in the DRAM evolution was to realize 1-T DRAM cell.One

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additional capacitor is explicitly fabricated for storage purpose. To store '1', it ischarged and to store '0' it is discharged to '0' volt. Read operation is destructive. Senseamplifierisneededforreading.Readoperationisfollowedbyrestorationoperation.

UNITIVDESIGNINGARITHMETICBUILDINGBLOCKS

1. HowdatapathcanbeimplementedinVLSIsystem?

   A data path is best implemented in a bit-sliced fashion. A single layout is usedrepetitively for every bit in the data word. This regular approach eases the design effortandresultsinfastand denselayouts

2. Write short noteontheperformance ofripplecarryadder.

   A ripple carry adder has a performance that is linearly proportional to the number ofbits. Circuit optimizations concentrate on reducing the delay of the carry path. A numberof circuit topologiesexist proving that careful optimization of the circuit topology andthetransistorsizeshelpstoreducethecapacitanceon thecarrybit

3. What are the advantages of ripple carryadder?Circuitrealizationisverysimpl eConsumes less power
   Compactlayoutgivingsmallerchiparea

4. Whatiscarryskipadder?

   A carry skip adder consists of a simple ripple carry adder with a special speed upcarry chain called a skip chain. The carry skip circuitry consists of two logic gates. TheANDgateaccepts thecarryinbitandcompares ittothegroupppropagatesignal.

5. Whatismirroradder?

   In thiscircuitrealization thePMOSnetwork isidentical tothe NMOSnetworkratherthanbeingtheconductioncomplement,sothetopologyiscalledamirrorad der.

6. Whataretheadvantages ofcarryskipadder?

   Thepropagationdelayissmallercomparetoripplecarryadderwhenoptimalstagesareused.
   Thecarryskip adderis showntobesuperior toconstantwidthcarryskip moduletheadvantages being greater athighprecisions.

7. Whatisthe logicofadderforincreasing itsperformance?

   Other adder structures use logic optimizations to increase the performance (carry-bypass,carryselect,carrylookahead).Performanceincreasecomesatthecostofarea.

8. Whatisamultipliercircuit?

   A multiplier is nothing more than a collection of cascaded adders. Critical path is farmorecomplexandoptimizations aredifferentcomparedtoadders.

9. Defineinputordering.

   For PMOS and NMOS the inner inputs encounters the body effect and requires highthreshold voltage to turn on. By input ordering the rare changing inputs are moved toinnerinputs.Thisprovides sufficientpower saving.

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10. Whichfactorsdominatesthe performance ofaprogrammableshifter?
    Theperformanceandtheareaofaprogrammableshifteraredominatedbythewiring.

11. Writedowntheexpressiontoobtaindelayfor N-bitcarrybypassadder.tadder=tsetup+M*tcarry+(N/M-1)*tbypass+(M-1)*tcarry+tsum

12. Definebraunmultiplier.
    The simplest multiplier is the Braun multiplier. All the partial products are computedin parallel, and then collected through a cascade of Carry Save Adders. The completiontime is limited by the depth of the carry save array, and by the carry propagation in theadder.Thismultiplierissuitableforpositiveoperands.

13. Whywegoforbooth'salgorithm?
    Booth algorithm is a method that will reduce the number of multiplicand multiples.For a given number of ranges to be represented, a higher representation radix leads tofewerdigits.

14. Listthedifferenttypesofshifter. Arrayshifter
    Barrel shifterLogarithmshifter

15. Whatarethevariousshiftoperationsavailable?
    Logicalleftshift
    Logical right shiftArithmetic left shift,Arithmeticright hift

16. Whatistheoutputaftertwoarithmeticrightshiftfor A=1001?
    Input = 1001
    Aftersecondarithmeticrightshift =1110

17. What isaManjestorcarrychainadder?
    It uses a cascade of pass transistors to implement the carry chain. Propogate&generate signals are generated using pass transistor logic. The capacitance per node onthecarrychainisverysmall&equalsonly4 diffusioncapacitances.

18. WhyiscarrybypassAddercalledso?
    Whenthe bypasscontrolsignal issetto'1', theincomingcarryisforwarded immediatelytothenextblockthroughabypasstransistor.

19. Whatistheimportanceoflinearcarryselect Adder?
    Thelineardependenciespresent inaripplecarryadderisavoidedinlinearcarryselect adder, by anticipating both possible values of the carry i/p and evaluate theresultfor bothpossibilitiesin advance.

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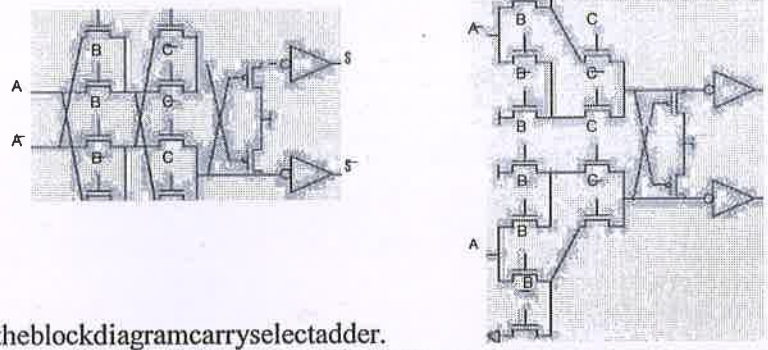
20. Whyisthepropagationdelayinacarryselect Adderis linearlyproportionaltoN?Itisbecausetheblockselectsignalthatselectsbetween0&1 solutionsstillhasto ripplethroughallstagesinworstcase.

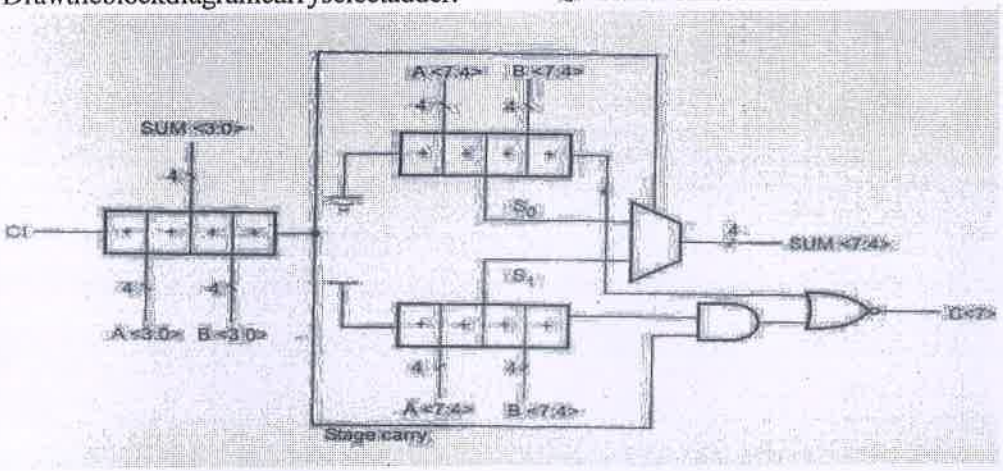
21. hatisabitserialmultiplier?

When area is of prime concern, it is possible to reduce the cost of the multiplier byusing a time multiplexed approach .Here, a combination of a single adder & a storageelementisusedtoiterativelycomputethesummationofthepartialproducts.

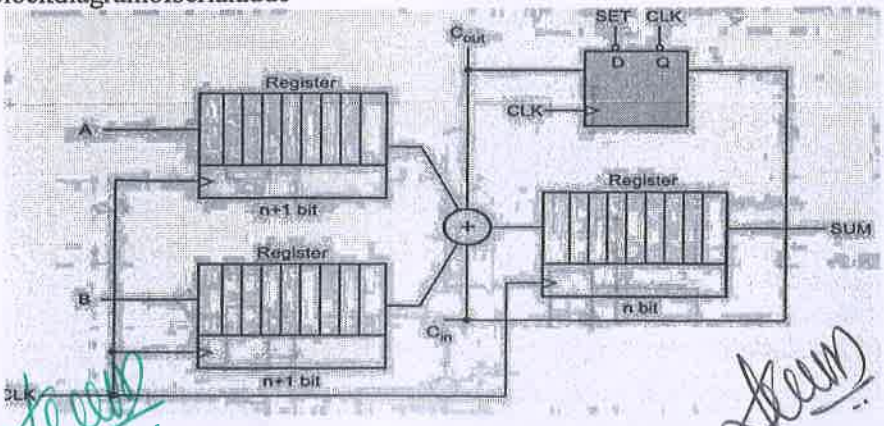
22. DrawthefulladderdiagramusingCPL.



23. Drawtheblockdiagramcarryselectadder.



24. Draw theblockdiagramofserialadde



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UNITVIMPLEMENTATIONSTRATEGIES

1. What isthestandardcellbasedASICdesign?

   A cell based ASIC (CHIC) uses predesigned logic cells known as standard cells. Thestandard cell areas also called flexible blocks in a CHIC are built of rows of standardcells.TheASICdesignerdefinesonlytheplacementofstandardcellsandinterconnectionin aCHIC.Allthemasklayersof aCHICarecustomizedandareuniquetoaparticular customer.

2. WhatisaFPGA?

   A Field Programmable Gate Array (FPGA) is a programmable logic device thatsupportsimplementationofrelativelylargelogiccircuits.FPGAscanbeusedtoimplement a logic circuit with more than 20,000 gates whereas a CPLD can implementcircuitsofup toabout20,000 equivalentgates.

3. WhatarethedifferentmethodsofprogrammingofPALS?
   1) Fusiblelinks
   2) UV-ErasableEPROM
   3) EEPROM(E^2PROM)-ElectricallyErasableProgrammable ROM.

4. Whatisanantifuse?

   An antifuse is normally high resistance (>100 MW). On application of appropriateprogramming voltages, the antifuse is changed permanently to a low resistance structure(200-500W).

5. Differentiatebetweenchanneledandchannellessgatearray.

Channeledgatearray	Channellessgatearray
Onlytheinterconnectiscustomized	Onlythetopfewmasklayersare customized
Theinterconnectusespredefinedspac esbetweenrows ofbasecells	Nopredefinedareasaresetasideforrouti ngbetweencells.
Routingisdoneusingspaces	Routingisdoneusingtheareaoftransistors unused
Logicdensityisless	Logicdensityishigher

6. Whatarethedifferentlevelsofdesignabstractionatphysicaldesign?Architecturalorf unctionalunit
   RegisterTransferlevel(RTL)Logiclevel
   Circuitlevel

7. Whataremacros?
   Thelogiccellsinagatearrayareoftencalledas macros.

8. WhatareprogrammableInterconnects?

   InaPAL,thedevice isprogrammedbychangingthecharacteristicsiftheswitchingelement.Analternativewould betoprogramtheroutingWhatarethetypes ofASICs?Full custom ASICs SemicustomASICs

9. What are the types of
   programmabledevices?ProgrammablelogicstructureProg rammableInterconnectReprogrammableGateArray

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10. WhatarethefeaturesofstandardcelledASICs?
    Allmasklayersarecustomized-
    transistorsandinterconnect.Customblockscanbeembedded
    Manufacturingleadtimeisabouteightweeks.

11. WhatarethecharacteristicsofFPGA?Noneofthemasklayersare customized
    Amethodofprogrammingthebasic logiccellsandthe interconnect.The core is a array of programmable basic logic cells that canimplement combinationalaswellas sequentiallogic(flipflops).
    AmatrixofprogrammableinterconnectsurroundsthebasiclogiccellsDesignturnaround isafew hours.

12. Whatisprogrammablelogicarray?
    A programmable logic array (PLA) is a programmable device used to implementcombinational logic circuits. The PLA has a set of programmable AND planes, whichlink to a programmable OR planes, which can then be conditionally complemented toproduce an output. Thislayoutallowsforalargenumberof logicfunctionsto besynthesizedinthesumofproductscanonicalforms.

13. Whatismeantbyprogrammablelogic plane?
    The programmable logic plane is programmable read only memory (PROM) arraythat allows the signals present on the devices pins to be routed to an output logic macrocell.

14. DefineROM
    A read only memory (ROM) is a device that includes both the decoder and the ORgates within a single IC package. It consists of n input lines and m output lines. Each bitcombination of the input variables is called an address. Each bit combination that comesout of the output lines is called a word. The number of distinct addresses possible with ninputvariablesis2n.

15. WhatisthefullcustomASICdesign?
    In aFull customASIC, an engineer designssome orallof thelogiccells, circuitsand layout specifically for one ASIC. It makes sense to take this approach only if thereare nosuitableexistingcelllibrariesavailable thatcanbeusedfortheentiredesign.

16. WhywasPALdeveloped?
    It was developed to overcome certain disadvantages of PLA, such as longer delaysdue to additional fusible links that result from using two programmable arrays and morecircuitcomplexity.

17. StatethetypesofROMMaskedROM.
    ProgrammableReadonlyMemoryErasableProgrammableRea donly memory.
    ElectricallyErasable ProgrammableRead onlyMemory.

18. GivethedifferenttypesofASIC.
    1.)FullcustomASICs
    2).SemicustomASICs3)programmableASICsProgram mableLogic Device .
    4.)FieldProgrammableGateArray(FPGA).

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CS8091-BIGDATAANALYTICS

POSSIBLE QUESTION

UNIT I- INTRODUCTION TO BIG DATA

1. What is Bigdata? Describe the main features of a big data in detail.
2. List the main characteristics of Big Data.
3. Explain in detail about Nature of Data and its applications.
4. Explain in detail about Storage Considerations in Big Data.
5. Explain in detail about HDFS.
6. Briefly discuss about MapReduce and YARN.

UNIT II CLUSTERING AND CLASSIFICATION

1. Explain about k-means Clustering in detail.
2. Explain about Classification of Decision trees in detail.
3. Explain in detail about Naïve Bayes Classification.
4. How evaluation is performed on decision trees?

UNIT III ASSOCIATION AND RECOMMENDATION SYSTEM

1. Explain about the basics of Recommendation Systems
2. Explain content-based filtering in detail.
3. Explain about Collaborative Filtering in detail.
4. Explain in detail about Apriori Algorithm.
5. Explain Association Rules in detail.

UNIT – IV STREAM MEMORY

1. Explain the Data streaming concept in detail.
2. Explain with a neat diagram about Stream data model and its Architecture.
3. Explain Filtering a stream in detail.
4. Explain the concept of Estimating Moments
5. Explain in detail on Counting ones in a Window.
6. Explain the following: i. Decaying Windows ii. RTAP Applications

UNIT V NO SQL DATA MANAGEMENT FOR BIG DATA AND VISUALIZATION

1. Explain in detail about HIVE.
2. Give a Survey on Analyzing Big data with Twitter.
3. List the classification of NoSQL database and explain about key value stores.
4. Describe the system architecture and components of HIVE and HADOOP.
5. What is NoSQL? What are the advantages of NoSQL? Explain the types of NoSQL databases.

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10. WhatarethefeaturesofstandardcelledASICs?
    Allmasklayersarecustomized-transistorsandinterconnect.Customblockscanbeembedded Manufacturingleadtimeisabouteightweeks.

11. WhatarethecharacteristicsofFPGA?Noneofthemasklayersare customized
    Amethodofprogrammingthebasic logiccellsandthe interconnect.The core is a array of programmable basic logic cells that canimplement combinationalaswellas sequentiallogic(flipflops).
    Amatrixofprogrammableinterconnectsurroundsthebasiclogiccells.Designturnaround isafew hours.

12. Whatisprogrammablelogicarray?
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MG8591 – PRINCIPLES OF MANAGEMENTPOSSIBLE QUESTIONS

UNITIINTRODUCTION TOMANAGEMENTANDORGANIZATIONS

1. DiscussaboutManagementan artorscience?
2. Discusstheprinciplesandtechniquesofscientific management.
3. Examinethefourteenprinciplesofar management advocatedbyHenryFayol
4. Classify the different roles and functions of managers andexplain them in detail.
5. Explainthevariousfunctionsofmanagement.
6. Explaintheevolutionofmanagementindetail.
7. Describetherelativeimportanceofeachtypeofskillstolower,middleandupperlevelmanagers

UNITIIPLANNING

1. Whatisplanning?Explainthestepsinvolvedinplanning
2. Define MBO. Describe the benefits and weakness of MBO and ways to overcomethem
3. Definedecisionmaking.Explaintheprocessofdecisionmakingthataffectstheefficiencyof thebusiness decisions.
4. .Defineforecasting.Explainthevariousforecastingtechniquesusedfordecisionmakingprocess.
5. .IdentifythevarioustypesofPolicieswithexamplesalsoexplainhowwillyouframepolicies.

UNITIIIORGANISING

1. Examinethedifferenttypes oforganizationalstructuresfollowedbythecompanies
2. Whatdoyouunderstandbyorganizationchart?Explainthebasisofthe departmentalization.
3. Relatetheconceptofcentralizationand decentralization inanOrganization?
4. Distinguishbetweenformalandinformalorganization.
5. AnalyzetheHumanResourceManagement activitiesinabusinessorganization.
6. Howcouldyoudeterminevariousperformanceappraisaltechniques?Inventtheneedforperformance appraisal.
7. WhatisSpanofControl?Writedownthedifferentfactorsinfluencingspanof Control?

UNITIVDIRECTING

1. Definemotivation.Explain thetheoriesofmotivationindetail.
2. Whatdoyouunderstandby"leadershipstyle"?Describethedifferentstylesofleadership.
3. Explainthe termmotivation. Compare andcontrast earlytheoriesof Motivation
4. Expresstheprocessofcommunication.
5. ExaminethetheoriesofLeadership.
6. (i)Identifybarrierstoeffectiveinterpersonal communication.

UNITVCONTROLLING

1. Whatiscontrol?Explainthephasesincontrol.
2. Discuss in detail about budgetary control and nonbudgetary control.
3. Illustrate and explain the three steps involved in the control process.
4. Analyzethefactors affectingproductivity.

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POSSIBLE IMPORTANT QUESTIONS

GE3151 PROBLEM SOLVING AND PYTHON PROGRAMMING

S.NO	QUESTION	MARKS	BTL
1	**How does flow of control works?**	2	L1
2	Write a snippet to display " HELLO WORLD" in Python Interpreter.	2	L1
3	Outline the modes Python interpreter works.	2	L1
4	Illustrate the use of (*) and(+) operators with an example.	2	L2
5	Are comments executable statement in a Python program? How the comments are included in a Python program?	2	L2
6	Identify the Operand(s) are Operator(s) in the given expression: C= a+ b*c	2	L2
7	Write a Python program to accept two numbers , find the greatest and print the result.	2	L3
8	**Name the types of conditional statements supported by Python?**Give the syntax of if..else.	2	L3
9	Comment with an example on the use of local and global variable with the same identifier name.	2	L3
	PARTB-(2X16=32marks)		
10a)	Explain with relevant diagrams and algorithm the Towers of Hanoi problem.	16	L1
10 b)	i) Draw a flowchart to accept three distinct numbers , find the greatest and print the result. ii) Draw a flow chart to find the sum of the series: 1+2+3+4+5+.....+100	8 8	L1 L1
11a)	Name the types of operators supported by Python and outline any two with relevant example	16	L2
	(Or)		

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11b)	i)Outline the while loop , break statement , continue statement in Python with an example . ii)Write a Python program to using function to find the sum of first ten odd numbers and print he result?	8 8	L3 L

Answer ALL questionsPARTA-(9X2=18 marks)

S.NO	QUESTION	MARKS	BTL
1	What is an algorithm ?	2	L1
2	Write a pseudo-code to accept two numbers, add the numbers and print the result.	2	L1
3	Outline the modes Python interpreter works.	2	L1
4	State the difference between (*) and (**) operators in Python.	2	L2
5	Are comments executable statement in a Python program? How the comments are included in a Python program?	2	L2
6	Identify the Operand(s) are Operator(s) in the given expression Sum=a+b	2	L2
7	Write a Python program to accept two numbers, find the greatest and print the result.	2	L3
8	Name the two types of Iterative statements supported by Python?	2	L3
9	Define a Recursive function.	2	L3

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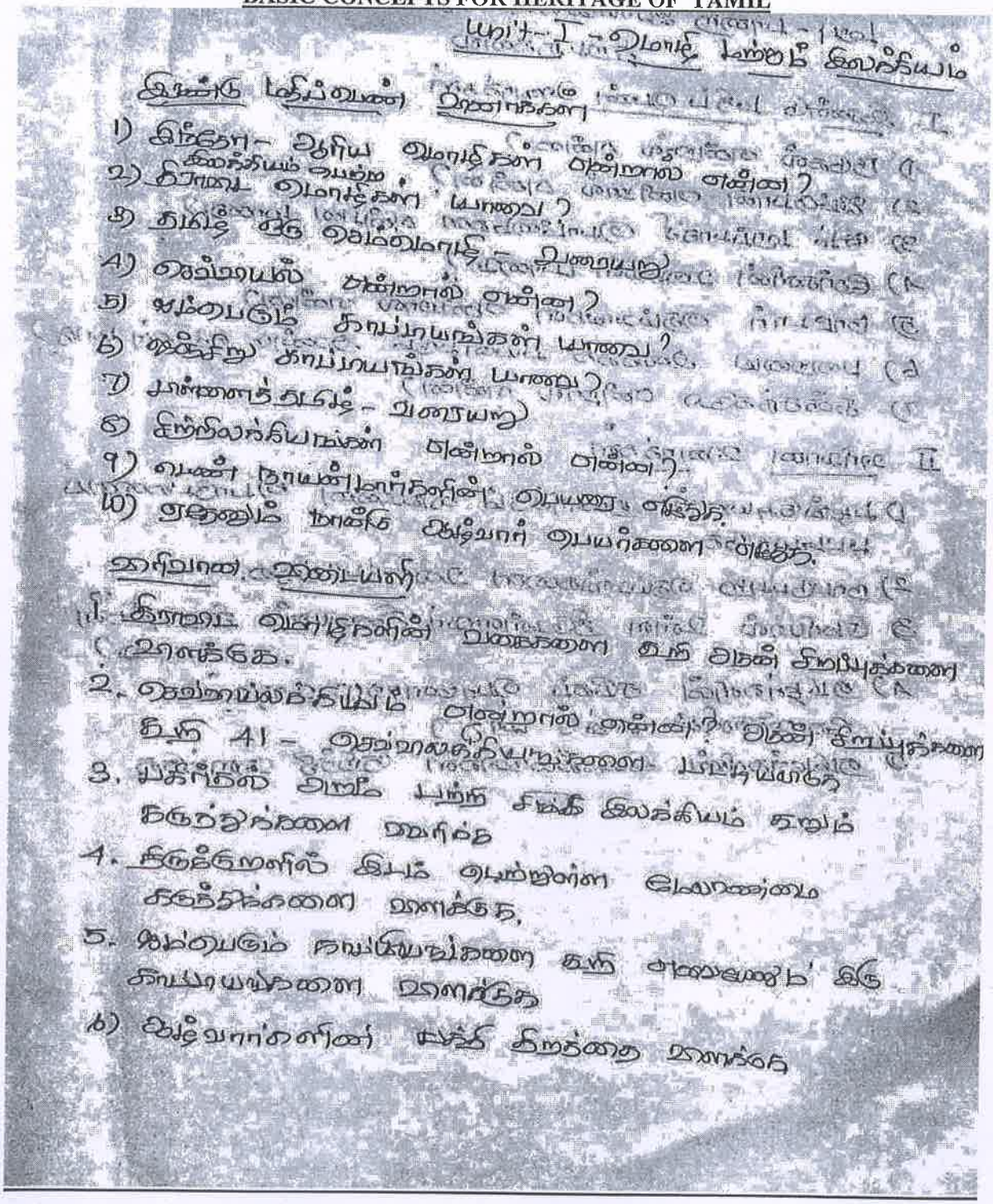
BASIC CONCEPTS FOR HERITAGE OF TAMIL



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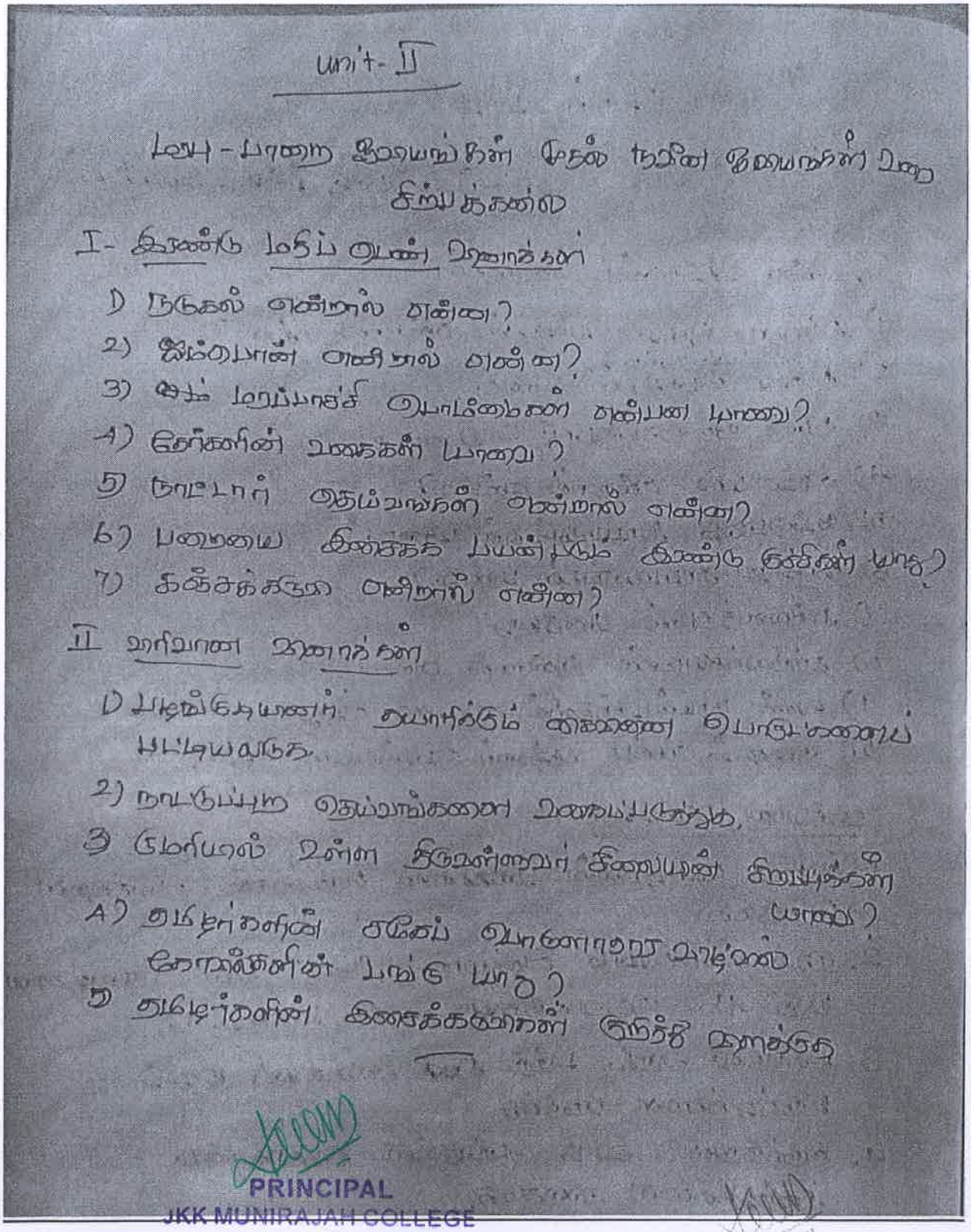

யூnit- II

வடிவ - பாறை ஓவியங்கள் சேந்த நாகரீக ஓவியங்கள் பற்றி கீழ்க்குறிப்பிடுக

I- குறுகிய மதிப்பெண் வினாக்கள்

1) நடுகல் என்றால் என்ன?
2) இடுமான் எனில் என்ன?
3) ஆய் மரபுவாரிசு யாரிடமிருந்து கிடைத்தன பாரை?
4) தேனின் வகைகளை பாரை?
5) நாட்டார் தெய்வங்கள் பெண்கள் என்ன?
6) பறையை இசைக்க பயன்படும் குறுகிய தோல் யாது?
7) கிழிச்சுக்குரை எனில் என்ன?

II விரிவான வினாக்கள்

1) பழங்கால மனிதர் தொழிற்கும் விலங்கு பொருட்களைப் பட்டியலிடுக.
2) நடுகற்களை வகைப்படுத்துக.
3) முல்லை நிலம் உள்ள திருவள்ளுவர் கூறியுள்ள நிலப்பிரிவுகள் யாவை?
4) குறிஞ்சியின் முக்கிய தொழிலாகிய வேட்டை கொலையின் பங்கு யாது?
5) குறிஞ்சியின் நிலைக்களனை விரிவாக எழுதுக.

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DEPARTMENT OF SCIENCE AND HUMANITIES
PERVIOUS YEAR QUESTION PAPER –MATRICES AND CALCULUS

Reg. No. : E N G G T R E E . C O M

Question Paper Code : 30234

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

First Semester

MA 3151 — MATRICES AND CALCULUS

(Common to : All Branches (Except Marine Engineering))

(Regulations 2021)

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Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. If two eigen values of the matrix $A=\begin{pmatrix}2&2&1\\1&3&1\\1&2&2\end{pmatrix}$ are equal to 1 each, find the eigen value of A^{-1}.
2. Write the uses of Cayley-Hamilton Theorem.
3. If $y=x\log\left(\frac{x-1}{x+1}\right)$, then find $\frac{dy}{dx}$.
4. Find the point of inflection of $f(x)=x^3-9x^2+7x-6$.
5. Write Euler's theorem on homogeneous functions.
6. If $x=r\cos\theta$, $y=r\sin\theta$, find $\frac{\partial(x,y)}{\partial(r,\theta)}$.
7. Evaluate $\int\theta\cos\theta\,d\theta$ using integration by parts.
8. Find the value of $\int_0^{\pi/2}\sin^6 x\,dx$.
9. Evaluate $\int_0^1\int_0^x dy\,dx$.
10. Transform the double integral $\int_0^2\int_y^2\frac{x\,dx\,dy}{x^2+y^2}$ into polar coordinates.

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PART B — (5 × 16 = 80 marks)

11. (a) (i) Find the eigen values and eigen vectors of $A=\begin{pmatrix}1 & 1 & 3\\ 1 & 5 & 1\\ 3 & 1 & 1\end{pmatrix}$. (8)

(ii) Verify Cayley-Hamilton theorem for the matrix $A=\begin{pmatrix}1 & 1 & 1\\ 1 & 2 & -3\\ 2 & -1 & 3\end{pmatrix}$. (8)

Or

(b) Reduce the quadratic form $2x_1x_2-2x_2x_3+2x_3x_1$ into the canonical form and hence find its nature. (16)

12. (a) (i) Find the values of a and b that make f continuous on $(-\infty,\infty)$ if

$$f(x)=\begin{cases}\dfrac{x^3-8}{x-2}, & \text{if } x<2\\ ax^2-bx+3, & \text{if } 2\le x<3\\ 2x-a+b, & \text{if } x\ge 3\end{cases}$$ (8)

(ii) Find $\dfrac{dy}{dx}$ if $y=x^2e^{2x}\left(x^2+1\right)^4$. (4)

(iii) If $x^y=y^x$, Prove that $\dfrac{dy}{dx}=\dfrac{y(y-x\log y)}{x(x-y\log x)}$ using implicit differentiation. (4)

Or

(b) (i) Show that $\sin x(1+\cos x)$ is maximum when $x=\pi/3$. (6)

(ii) A window has the form of a rectangle surmounted by a semicircle. If the perimeter is 40 ft., find its dimensions so that greatest amount of light may be admitted. (10)

13. (a) (i) Given the transformations $u=e^x\cos y$ and $v=e^x\sin y$ and that f is a function of u and v and also of x and y, prove that $\dfrac{\partial^2 f}{\partial x^2}+\dfrac{\partial^2 f}{\partial y^2}=\left(u^2+v^2\right)\left(\dfrac{\partial^2 f}{\partial u^2}+\dfrac{\partial^2 f}{\partial v^2}\right)$. (8)

(ii) Expand $e^x\log(1+y)$ in powers of x and y up to terms of third degree. (8)

Or

(b) (i) Examine for extreme values of $f(x,y)x^4+y^4-2x^2+4xy-2y^2$. (8)

(ii) A rectangular box, open at the top, is to have a volume of 32 c.c. Find the dimensions of the box, that requires the least material for its construction. (8)

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14. (a) (i) Evaluate $\int \frac{3x+1}{(x-1)^2(x+3)}dx$ by applying partial fraction on the integrand; (6)

(ii) Evaluate $\int_0^{\pi/2} \log\sin x\,dx$ and hence find the value of $\int_0^1 \frac{\sin^{-1}x}{x}dx$. (10)

Or

(b) (i) Evaluate $\int \frac{\sqrt{9-x^2}}{x^2}dx$ using trigonometric substitution. (6)

(ii) Determine whether the integral $\int_1^\infty \frac{1}{x}dx$ is convergent or divergent. (4)

(iii) Find the volume of the reel shaped solid formed by the revolution about the y-axis, of the part of the parabola $y^2=4ax$ cut off by its latusrectum. (6)

15. (a) (i) Find the area between the curves $y^2=4x$ and $x^2=4y$. (8)

(ii) Change the order of integration in $\int_0^\infty \int_0^y ye^{-y^2/x}dx\,dy$ and then evaluate it. (8)

Or

(b) (i) Find the volume of the sphere of radius 'a'. (8)

(ii) Find the moment of inertia of the area bounded by the curve $r^2=a^2\cos 2\theta$ about its axis. (8)

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IMPORTANT QUESTIONS -PH3151-ENGINEERING PHYSICS

1. Define centre of mass of the system.

Consider the motion of a system consisting of a large number of particles. There is one point in it which behaves as though the entire mass of the system were concentrated there and all the external forces were acting at this point. This point is called the centre of mass of the system.

2. Define rigid body.

A rigid body is defined as that body which does not undergo any change in shape or volume when external forces are applied on it.

3. Define moment of inertia of a particle

- The moment of inertia of a particle about an axis is defined as the product of the mass of the particle and square of the distance of the particle from the axis of rotation.
- If 'm' is the mass of the particle and 'r' is the distance of the particle from the axis of rotation, then
- The moment of inertia of the particle

$$I = mr^2$$

4. What are the factors the moment of inertia depends on?

Moment of inertia depends on mass, distribution of mass and on the position of axis of rotation.

5. What are the physical significance of moment of inertia?

- The property which opposes the change in rotational motion of the body is called the moment of inertia. Greater is moment of inertia of the body about the axis of rotation, greater is the torque required to rotate the body.
- Thus it is clear that the moment of inertia of a body has the same role in rotational motion as that of mass (or inertia) is linear motion.

6. State parallel axis theorem.

The moment of inertia of a body about any axis is equal to the sum of its moment of inertia about a parallel axis passing through its centre of gravity of the body and the product of its mass of the body with the square of the istancebetween the two axes.t

7.State perpendicular axis theorem.

It states that the moment of inertia of a plane lamina about an axis perpendicular to its plane is equal to the sum of the moments of inertia of the plane lamina about any two mutually perpendicular axes in its own plane and intersecting each other at the point where the perpendicular axis passes through it.

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8. **Define angular momentum.**

Angular momentum of a particle is defined as its moment of linear momentum it is given by the product of linear momentum and perpendicular distance of its line of action from the axis of rotation. It is denoted by $\vec{L}$.

9. Define torque.

- The moment of the applied force is called torque. It is represented by the symbol 'τ'.
- If F is the force acting on a body at a distance r then,
- Torque = Force × distance

i.e., $\vec{\tau} = \vec{F} \times \vec{r}$

The rotational motion is due to only when the torque acts on the body.

10. State conversation of angular momentum.

The law of conservation of angular momentum states that in the absence of an external torque, the angular momentum of a body or a system of bodies remains conserved.

11. What is gyroscope?

A gyroscope is a device used for measuring or maintaining orientation and angular velocity. It is a spinning wheel or disc in which the axis of rotation (spin axis) is free to assume any orientation by itself.

12. What are the uses of gyroscope?

1. In view of the property of stability, the gyroscope are used as stabilizers in ships, boats and aeroplanes.

2. Due to the inherent stability of the gyroscope, it is used as a compass, and a gyro-compass is preferable to the magnetic compass in many respects.

3. Another important application of the directional stability of a rapidly spinning (rotating) body is the rifling of the barrels of the rifles.

UNIT II: ELECTROMAGNETIC WAVES

1. Give the Maxwell's equations in differential form.

$$\vec{\nabla} \cdot \vec{D} = \rho$$

$$\vec{\nabla} \cdot \vec{B} = 0$$

$$\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$

$$\vec{\nabla} \times \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$$

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2.What is intrinsic or characteristic impedance of free space?

- The ratio $\frac{\vec{E}}{\vec{H}}$ is having the unit of impedance (Resistance)
- ie., ohm, Therefore, the quantity $\sqrt{\frac{\mu_o}{\varepsilon_o}}$ has the dimensions of impedance.
- It is known as **intrinsic or characteristic impedance of free space, denoted by Z_0**. It is a constant quantity for free space and having value = 377Ω.

3. What is poynting vector?

The cross product of electric field vector $\vec{E}$ and the magnetic field vector $\vec{H}$ is called poynting vector. It is denoted by $\vec{S} = \vec{E} \times \vec{H}$.

5. Give the Properties of Electromagnetic Waves.

(i) Electromagnetic waves are produced by accelerated charges.

(ii) They do not require any material medium for propagation.

(iii) In an electromagnetic wave, the electric $(\vec{E})$ and magnetic $(\vec{B})$ field vectors are at right angles to each other and to the direction of propagation. Hence, electromagnetic waves are transverse in nature.

(iv) Variation of maxima and minima in both $\vec{E}$ and $\vec{B}$ occur simultaneously (in phase).

(v) They travel in vacuum or free space with a speed 3×10^8 ms^{-1} given by the relation

(μ_0 - permeability of free space and ε_0 - permittivity of free space)

(vi) The energy in an electromagnetic **wave** is equally divided between electric and magnetic field vectors.

(vii) The electromagnetic waves being chargeless, they are not deflected by electric and magnetic fields.

UNIT III:OSCILLATIONS,OPTICS AND LASERS

1. Define simple harmonic motion.

When the acceleration of particle is directly proportional to its displacement from its equilibrium position and it is always directed towards equilibrium position, then the motion of the particle is said to be simple harmonic motion.

2. What are the characteristics of simple harmonic motion?

• The motion must be periodic.

• The motion is oscillatory ie., to and fro along a straight line or along a curved path about a mean position.

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• The body executing simple harmonic motion is acted upon by a restoring force whose magnitude is proportional to the displacement and its direction is always towards the mean position.

• If there is no air resistance or friction, the motion once · started will continue indefinitely.

3. State Doppler effect.

The phenomenon of the apparent change in the frequency of the sound due to relative motion between the source of sound and the observer is called Doppler effect.

4. Give conditions of total internal reflection.

(a) The light should be incident from denser medium to rarer medium.

(b) The angle of incidence i in denser medium should be greater than critical angle θ_c.

5. Write the differences between spontaneous emission and stimulated emission

	Spontaneous emission	Stimulated emission
1.	Emission of light radiation is not triggered by external influence	Induced emissions of light radiations caused by incident photons
2.	Emitted photon travels in random direction	Emitted photon travels in particular direction
3.	Emitted photons cannot be controlled	Emitted photons can be controlled.
4.	This process is a key factor for ordinary light.	This process is a key factor for laser operation

6. What is meant by population inversion and how is it achieved?

The establishment of a situation in which the number of atoms in higher energy level is more than that in lower energy level is called population inversion. It is an essential requirement for producing a laser beam. It is achieved by pumping action.

7. What are the characteristics of the laser? (or) What are the properties of the laser beam?

• Laser light is highly coherent

• It is highly powerful and intense.

• It is directional and monochromatic.

• It is capable of travelling over long distance without any energy loss.

• It is extremely bright.

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8. What is the principle of laser action?

Stimulated emission process is a key factor for the laser action. This can be multiplied through chain reaction. This multiplication of photons through stimulated emission leads to coherent, powerful, monochromatic, collimated beam of light-emission.

9. Mention the applications of lasers in industry.

Nd:YAG and CO_2 lasers are very much used in industries for the laser welding, cutting, drilling and soldering.

UNIT IV: BASIC QUANTUM MECHANICS

1. State the properties of the matter waves.

(i) Lighter is the particle, greater is the wavelength ... associated with it.

(ii) Smaller is the velocity of the particle, greater is wavelength associated with it.

(iii) These waves are not electromagnetic waves.

(iv) The velocity of de Broglie wave is equal to the velocity of the material particle.

2. Write down Schroedinger time independent and dependent wave equations.

Schroedinger time independent wave equation is

$$\nabla^2 \psi + \frac{2m}{\hbar^2}(E - V)\psi = 0$$

Schroedinger time dependent wave equation

$$\left(-\frac{\hbar^2}{2m}\nabla^2 + V\right)\psi = i\hbar\frac{\partial \psi}{\partial t}$$

where $\nabla^2 = \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} + \frac{\partial^2}{\partial z^2}$ is Laplacian operator.

3. Mention some of the physical significances of the wave function.

(i) The wave function (Ψ) relates the particle and wave nature of matter statistically.

(ii) It is a complex quantity and hence we cannot measure it.

(iii) If the particle is certainly to be found somewhere in a space of dimensions dx, dy, dz, then the probability value is equal to one.

i.e., $P = \int_V \int \int |\psi|^2 \, dx \, dy \, dz = 1$

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4.DefineCorrespondance principle

.Any new theory in Physics must reduce to well-established corresponding classical theory when the new theory is applied to the special situation in which the less general theory is known to be valid.

5. What is the significance of zero point energy in a harmonic oscillator?

- For lowest (ground) state, n = 0

$$E_o = \frac{1}{2}h\nu$$

- This is the lowest value of energy, called **zero point energy**. Even it the temperature reduces to absolute zero, the oscillator would still have an amount of energy 1/2 hv.
- In old quantum mechanics, the energy of n^{th} level.

  En = nhv

  whereas in wave mechanics

$$E_n = \left(n + \frac{1}{2}\right)h\nu$$

6. What are the significance of tunneling effect?

1. Tunneling is a very important physical phenomena which occurs in certain semiconductor diodes. In such diodes electrons pass through potential barriers even though their kinetic energies are smaller than the barrier heights.

2. The tunneling effect also occurs in the case of the alpha particles. The kinetic energy of alpha particle is only a few MeV but it is able to escape from a nucleus whose potential wall is perhaps 25 MeV high.

3. The ability of electrons to tunnel through a potential barrier is used in the Scanning Tunneling Microscope (STM) to study surfaces on an atomic scale of size.

7. Define resonant tunneling.

- The transmission probability of the double symmetric barrier is maximum. The tunneling current reaches peak value when energy of electron wave is equal to quantised energy state of the well.
- This phenomenon is known as resonance tunneling.

8. State Block Theorem.

- If an electron in a linear lattice of lattice constant 'a' characterised by potential function V (x) = V (x + a) satisfies the Schoredinger equation

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$$\frac{d^2\psi(x)}{dx^2} + \frac{2m}{\hbar^2}[E - V(x)]\psi(x) = 0$$

- Then the wave functions Ψ (x) of electron (with energy E) obtained as a solution of Schrodinger equation are of the form

$$\psi(x) = u_k(x)\, e^{\pm ikx}$$

with $u_k(x) = u_k(x + a)$

PART - B
16 MARKS QUESTIONS
UNIT I UNIT I: MECHANICS

1. State and prove the theorem of perpendicular axis for the moment of inertia of a plane lamina.
2. Discuss the moment of inertia and rotational energy states of a rigid diatomic molecule.
3. Describe principle, construction and working of gyroscope. Mention its application in various fields.
4. Derive an expression for time period of torsion pendulum. Explain how it is used to find rigidity modulas of a wire.
5. Write notes on double pendulum.

UNIT II: ELECTROMAGNETIC WAVES

1. Derive Maxwell's equations in differential and integral form.
2. Deduce Maxwell's equations for free space.
3. Explain reflection and transmission of electromagnetic waves.

UNIT III: OSCILLATIONS,OPTICS AND LASERS

1. Explain the formation of interference fringes in an air-wedge shaped film. How is the thickness of the wire determined by this method?
2. Describe Michelson interferometer and explain how the fringes form in it. How can this be used for measuring the wavelength of monochromatic light. Derive the formula.
3. For atomic transitions, derive Einstein relations and hence deduce the expressions for the ratio of spontaneous emission rate to be stimulated emission rate.
4. Explain the construction and working of Nd - YAG laser with neat diagram.
5. Explain the modes of vibrations of CO_2, molecule. Describe the construction and working of CO_2 laser with necessary diagrams.
6. Explain the principle, construction and working of a semiconductor diode laser with necessary diagrams.

UNIT IV: BASIC QUANTUM MECHANICS

1. Explain Compton effect and derive an expression for the wavelength of scattered photon. Also briefly explain its experimental verification.
2. DeriveSchroedinger's time independent and time dependent wave equation.
3. Solve Schrodinger wave equation of a particle in box (one dimensional) and obtain the energy eigen values.

UNIT V: APPLIED QUANTUM MECHANICS

1. Discuss barrier penetration and quantum tunneling.
2. What is the principle of scanning tunnelingmicroscope. Explain the construction and working of scanning tunneling microscope with a suitable diagram.
3. Write a note on resonant diode.
4. Explain Bloch's theorem for particles in a periodic potential.
5. Discuss Kraningpenney mode

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BASIC GRAMMER RULES -HS3152- PROFESSIONAL ENGLISH -I

Tenses:

1) Use the correct tense forms of the verbs given in brackets to fill up the blanks:
A decade ago the most vehement opposition to computerization came(come) from people who believed (believe) that it led (lead) to unemployment. There were (be) a hue and cry over this.

2) Fill in the blanks in the following sentences with the appropriate tense forms ofthe verbs given in brackets:
a) They ------built--- (build) this castle in 1765.
b) Liz ---has not finished--- (not finish) her homework yet.
c) Look! Jane and Joseph ---are playing- (play) tennis.
d) A heavy wind --blowed--- (blow) when the helicopter laed.

3) Fill in the blanks with suitable tense forms of the verbs given in brackets:
Stephen Hawking is one of the most brilliant theoretical physicists. He --was--- (be) also a popular writer. His first book, "A Brief History of Time" -------published--- (publish) in 1988 and ---became--- (become) an international best seller. In it, he ----explained--- (explain) about the birth and death of the universe to the lay person.

WH Questions

4) Frame 'Wh' questions for the responses given.
(a) Spain won the FIFA World Cup in the finals in the year 2010.(Which)
Which country won FIFA world cup?
(b) Brazil shall host the 2014 World Cup in June-July. (When)
When shall Brazil host the world cup ?
(c) Brazil has won the World Cup five times. (How many)
How many times Brazil won the world cup
(d) MARADONA of Argentina was the great player in 1986. (Who)
Who is Maradona ?

a. Frame Yes / No question from the given sentences:
a) She learns music.Does she learns music ?
b) You can speak French.Can you speak French?
c) She is an Engineer Is she an Engineer?
d) They drives the car Do they drive a car ?

b. Change the statements to questions using the question word in parenthesis.
a) My friend told me that he would come to my house at 8o'clock. But he came only at 10 o'clock. (When)
When did your friend came ?
b) I would like to stay in the hotel for five days. (How long)
How long would you like to stay?
c) I didn't attend the class on Friday since I was ill for two days. (Why)
why he didn't attend the class?
d) Yesterday I went to the post office. I had to send a letter to the Manager of the company. (Where)
Where did you went yesterday?

c. Change the statements to questions using the question word in parenthesis
a) The children are very sincere and they do their homework at night. (when)
When do the children do their homework?
b) I feel so tired since I have been waiting here for two hours. (how long)
How long you have been waiting?
c) I didn't inform her about his arrival because she kept her mobile phone in the switch off mode. (why)
Why you didn't inform her about his arrival?
d) My friend, Sam, is a rich man and he is a Software engineer in HCL. (what)
What is your friend Sam?

Synonyms

5) Match the words in the column A with their synonyms in column a) Abundance - i) enormous
b) Gigantic - ii) plenty

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c) Drawback - iii) variety
d) Diversity - iv) disadvantage
a- I, b –I, c-iv, d-iii

A} Choose the best word from the four options that can be used for the meaning given: a)

a) One who has the ability to think and plan
(i) Philosopher (ii) fortune teller (iii) Visionary (iv) Prophet
b) The speech sounds of a language are called as
(i) Alphabet (ii) Phonology (iii)Sound cord (iv) Phoneme
c) Murder of a whole race or group of people
(i) Massacre (ii) Fumigate (iii) Fungicide (iv) Genocide
d) The origin of something
(i) Start (ii) Open (iii) Genesis (iv) Genius

6) Give one word substitutes for the following:

a) A traveler in space. – astronaut
b) One who can neither read nor write.Illiterate
c) Life history written by himself Autobiography
d) One who have belief in God Theist

Prepositions

7)Write suitable prepositions in blanks:

The only language that can rival English--in--sheer strength---of---numbers is Chinese. Chinese is the mothertongue---
of---1000 million people, nearly three times the number--of ----- mother-tongue speakers of English.

8) Fill in the blanks with suitable prepositions:

a. Kanchipuram is famous ---for---- silksarees b. Kerala abounds ---in --- coconut trees
c. The meeting started --in-- time d. Smoking is injurious ----to -- health
a. She drove the car with a speed of 80 miles an hour
b. The factory has been closed for two years
c. The room measures 60 feet to 40 feet
d. Yesterday the Chairperson left in New Delhi

9) Fill in the blanks with suitable prepositions:

Steve Jobs co-founded Apple Computer with Steve Wozniak
garage venture _into a technology giant.
in 1976. It soared___from its start as a

Prefix & Suffix

10) . Give antonyms of the following words by adding suitable negative prefixes

a) unfamiliar b) insignificant c) inefficient d)disapprove

11. Fill in the blanks with suitable prefixes to get the meaning given against each word.

(a) --thermonuclear - nuclear reactions at very high temperatures
(b ----bio --- medical - relating to how biology affects medicine
(c) ---Self---reliant - able to decide things by oneself
d) ---Nano--technology -relating to very small structures

12. Make antonyms of the following words by adding suitable prefixes.

a) Discourteousb) inhabited c) imperceptible d) injustice
a) abNormal b) impurec) dislike d)dishonest

a) Complete the word in the blank using the correct suffix:

a) His exemplary service in the army proves his patriotism (-ness,-ism,-cy,-ward)
b) I found a new booklet _ on dental health in the library. (-let,-ish,-worm,-ing)
c) Sugar crystalizes very quickly. (-ism, -ing, -izes, -ed)
d) The stranger had a strange appearance . (-ing, -ance, -less,-dis

6) Phrasal Verbs

13. Form sentences using any two of the following phrasal verbs

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a) put off - Please put off your shoes before entering this holy building
b) put out - The cattle were put out to pasture
c) call off - The meeting was called off
d) call out - I tried to call out to him through the window
a) get over - it get over a year to recover from the loss of my father
b) back off - The soldiers backed off from the war
c) breakdown- She breaks down when she heard the bad news.
d) look up – she looks up for the new word in the dictionary.

14. Supply suitable Phrasal verbs in the blanksprovided:
(came across, look at, coming back, get on,look after)
(a) There was traffic jam. We couldn't ----- **look at**
(b) My friend is leaving today and --**coming back** -- on Wednesday.
(c) I ----**look after** ---- this book in the old book stall.
(a) They -----**get on**---- carefully --------**came across** ----- a problem.

15Fill in the blanks with suitable phrasal verbs.
(tied him up, looks up, move out, washed away)
a) He ---**looks up** ----the word in the dictionary.
b) You must -----**move out** ---- of the town.
c) Rough sea -----**washed away** --- 100 houses in Dhaka.
d) The police -------**tied him up**-- with chains.

Homonyms:

16. Read the homonyms given below and give an example each.
a) Bank/Bank I have an account in Axis Bank
The breeze in the river bank is enjoyable
b) lead/lead Lead is a metal
The manager leads the team
c) Act – act She acts well
The new act is appreciable
d) Bark -bark The dog barks
The bark of the tree is old.

17. The underlined words in the following sentences are homonyms. Use any two of them in sentences of your own, each with a meaning different from the meaning given.
Names in the **right** hand column of the register, please! And place your bags under the **light** please!
a) The answer is Right
b) The new bag is light weight

Complete the following sentences using homophones
a) Education plays an important ---------- in man's life. (Roll, role)
b) She is too ---------- to walk. (Week, weak)
c) Although he walked 2 kilometers a day, he could not (lose, loose) his weight
d) The lady of the house faced many difficulties in the absence her (maid/made)
e) The child (threw/though) the ball into the tank.
f) They met the (their/there) friends in the park
g) The chief guest has accepted to come on any day in this (week/weak)
h) I couldn't get (birth/berth) reservation in the train.
i) The chair is made of (steal/steel)
j) I don't know why he (stairs / stares) at me for a long time.
k) No one can ---------- my opinion. (alter, altar)
l) He was standing ---------- me. (besides, beside)

Concord (Subject verb agreement):

(18)_Check the following sentences for the subject-verb agreement:
(a) Time and tide wait for no man.
Time and tide waits for no man.

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(b) Neither the King nor the Queen were worried about the poor people.
Neither the King nor the Queen was worried about the poor people.
(c)The tallest of the girls stay in the hostel.
The tallest of the girls stays in the hostel.

(19) Check the following sentences for subject-verb agreement:

a. The captain as well as his soldiers were killed in the battle.
The captain as well as his soldiers was killed in the battle.
b. One of my books are missing.
One of my books is missing
c. None of them speak Tamil.
None of them speaks Tamil.
d. The president and the secretary is present.
The president and the secretary are present.

(20) Check whether the following sentences have subject verb agreement and rewrite them correctly:

(a) Society are knit together by some commonly held beliefs.
Society is knit together by some commonly held beliefs.
(b) Each of the girls have won a prize.
Each of the girls has won a prize.

21) Choose the correct form of verb that agrees with the subject:

a) The Minister, together with his wife, -------- (greets, greet) the press cordially.
b) The players, as well as the captain, ---------- (want, wants) to win.
c) Neither the teacher nor the students ---------- (seem, seems) to understand this assignment.
d) One of my teachers --------- (have, has) written a letter of recommendation for me.

Discourse Markers:

23) Use suitable discourse markers to link the sentences.

(a) Glass breaks easily. Glass has many properties.
Glass breaks easily because it has many properties.
(b) The pressure inside the boiler increased. The safety valve has not opened.
The pressure inside the boiler increased so the safety valve has not opened.

24. Choose the correct relative pronoun to fill the blank.
(that, which, who, whom)

a) The tallest child, **who** was also oldest, was also most outstanding.
b) I don't recognize the song **which** __is playing.
c) I rode my bike, **that**has a headlight home in the dark.
d) I heard someone at the door but wasn't sure whom it was.

25. Choose the right Pronoun and complete the sentences:

1. This is not pen. (mine/my)
2. Selvi is going out with friends this evening. (her/ hers)
3. Whose bag is this? or his? (your/yours)
4. Can we use your iron box? is not working. (our/ours)

Collocations:

26.Fill in the blanks with right options to complete the collocations:

(a) Let's consult with the elders before we ------a decision
(i) Do (ii) make (iii) Create (iv) construct
(b) The students always ----- attention in his class
(i) Give (ii) pay (iii) Keep (iv) make
(c) It is a golden ----- we can't miss it
(i) Chance (ii) opportunity (iii) Offer (iv) possibility
(d) He should learn to ------ his emotions under control
(i) Keep (ii) hold (iii) Do (iv) make

27. Complete the collocation in the sentence by choosing the correct words:

a) The officer (pay/had) sympathy on the manager and offered financial aid.

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b) The dog in our house (went/get) missing when we moved to a new place.
c) The champion (broke/made) his own record in the Olympics.
d) The company (made/launched) a new product in the market last month.

28. Fill in the blanks with right options to complete the collocation.

a) Youngsters today seem to prefer food.
a) quick b) fast c) rapid d) speed
b) She tears when she heard the news.
a) burst into b) blew up in c) burst away d) blew away
c) Working mothers often find that they are unable to time for their children.
a) waste b) save c) spare d)spend
d) He wasn't sure if he would get an appointment but he was willing to go to the CM's office and take a .
A) opportunity b) choice c) break d) chance

11) Fixed & Semi Fixed Expression

29) Choose the correct fixed expressions from the options given:

i) Life is not (a joyful trip/ a bed of roses).
ii) He always came up with for coming late(a lame excuse/ silly ideas).
iii) It is difficult such boring people (to put down with/ to put up with).
iv) The answer was on (the tip of my mouth/ the tip of my tongue).

Articles:

30) Fill in the blanks with suitable articles wherever necessary:

a) The man I met yesterday was blind.
b) This is the best book on elementary chemistry.
c) The bird in hand is worth two in the bush.
d) He is not an honorable man.

Abbreviation and Acronyms:

31) Expand the following abbreviations and acronyms:

A) ICBM (b) PV a) TOEFL b) VIRUS a) LASER b) UNESCO

Answers

(a) Inter Continental Ballistic Missile (b) Poly Vinyl Chloride
a) Test of English As Foreign Language b) Vital Information Resource Under Seize
1. Light Amplification by Stimulated Emission of Radiation
2. United Nations Educational, Scientific and Cultural Organization

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DEPARTMENT OF SCIENCE AND HUMANITIES
PREVIOUS YEAR QUESTION PAPER –PROBLEM SOLVING AND PYTHON PROGRAMMING

B.E./B.Tech. DEGREE EXAMINATIONS, JANUARY 2022.

First Semester

Civil Engineering

GE 3151 – PROBLEM SOLVING AND PYTHON PROGRAMMING

(Common to All Branches)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1 Write an algorithm to accept two numbers, compute the sum and print the result.

2. Define an iterative statement.

3. Are comments executable statements in a Python program? How comments are included in a Python program?

4. Identify the operand (s) and operator (s) in the following expression:
$sum = a + b$.

5. Name the two types of iterative statements supported by Python.

6. Define a recursive function.

7. In Python, how the values stored in a list are accessed? Should the elements of a list be of the same data type?

8. How Python's dictionaries store data? Give example.

9. Write the syntax for opening a file to write in binary mode.

10. What are the different modules in Python?

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11. (a) (i) Draw a flow chart to accept three distinct numbers, find the greatest and print the result. (8)

(ii) Draw a flow chart to find the sum of the series

1 + 2 + 3 + 4 + 5 +....+ 100. (8)

Or

(b) State the Towers of Hanoi problem. Outline a solution to the Towers of Hanoi problem with relevant diagrams. (16)

12. (a) Outline the data types supported by Python with an example. (16)

Or

(b) Name the types of operators supported by Python and outline any two with an example. (16)

13. (a) Outline the conditional branching statements in Python with an example. (16)

Or

(b) (i) Outline while loop, break statement and continue statement in Python with an example. (12)

(ii) Write a Python program using function to find the sum of first 'n' odd numbers and print the result. (4)

14. (a) Name the operations that can be performed on a list and outline any four with an example. (16)

Or

(b) (i) Write separate Python programs to illustrate create, access, concatenate and delete operations in a tuple. (10)

(ii) Write a Python program to create a dictionary and sort the content based on values in reverse order. (6)

15. (a) Name the different access modes for opening a file and present an outline of the same. (16)

Or

(b) (i) What is an exception? Elaborate exception handling in Python. (8)

(ii) Wr a p am to enate the contents of two i sin file. the in two files from the user and t it.

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DEPARTMENT OF SCIENCE AND HUMANITIES

IMPORTANT FORMULAS MA3151 MATRICES AND CALCULUS

UNIT-III (FUNCTIONS OF SEVERAL VARIABLES)

PART - A

1. If $x = r\cos\theta$ and $y = r\sin\theta$, evaluate $\frac{\partial(x,y)}{\partial(r,\theta)}$.
2. If $u = \frac{x}{y} + \frac{y}{z} + \frac{z}{x}$, Find $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z}$.
3. State Euler's theorem on homogeneous function.
4. Find $\frac{du}{dt}$ if $u = \frac{x}{y}$, where $x = e^t, y = \log t$.
5. If $u = (x-y)^4 + (y-z)^4 + (z-x)^4$, show that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$
6. If $u = (x-y)(y-z)(z-x)$, show that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$.
7. If $\log u = \frac{x^3+y^3}{x+y}$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 2u\,\log u$.
8. If $u = \tan^{-1}\left(\frac{x^3+y^3}{x+y}\right)$, show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin 2u$.
9. Find the Jacobian of the transformation $u = \frac{2x-y}{2}, v = \frac{y}{2}$. Find $\frac{\partial(u,v)}{\partial(x,y)}$.
10. Find the Jacobian of the transformation $x = r\cos\theta, y = r\sin\theta$. Find $\frac{\partial(x,y)}{\partial(r,\theta)}$
11. Find the Jacobian of the transformation $x = u(1+v), y = v(1+u)$. Find $\frac{\partial(u,v)}{\partial(x,y)}$
12. Define stationary value
13. If $u = x^2 + y^2 + z^2$ and $x = e^t, y = e^t\sin t, z = e^t\cos t$ find $\frac{du}{dt}$
14. Find the stationary values for the function $f(x,y) = x^3 - y^3 - 3xy$
15. Find $\frac{dy}{dx}$ if $f(x,y) = x^3 - y^3 - 3xy$

PART - B

1. i) If f(x,y) = $\varphi(u,v)$, where $u = x^2 - y^2$ and $v = 2xy$, Prove that

$$\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} = 4(x^2+y^2)\left[\frac{\partial^2 \varphi}{\partial u^2} + \frac{\partial^2 \varphi}{\partial v^2}\right].$$

ii) If f be a function of x & y , u and v are the two variables, show that, $u = lx + my, v = ly - mx$ prove that

$$\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} = 4(l^2+m^2)\left[\frac{\partial^2 f}{\partial u^2} + \frac{\partial^2 f}{\partial v^2}\right]$$

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IMPORTANT QUESTIONS CY3151-ENGINEERING CHEMISTRY

UNIT-IWATER AND ITS TREATMENT

PART-A (2- MARKS)

1. What is the classification of impurities of water?
2. What is Hardness of water?
3. Define Scale and Sludge.
4. What is Desalination?
5. What is breakpoint chlorination?

PART-B (8 MARKS)

1. Explain the disadvantages of Boiler feed water..
2. Explain the Softening of water by Demineralization process.
3. Explain Water Quality Parameters.
4. Explain internal conditioning of water.
5. What is Desalination? Explain Reverse Osmosis method.
6. Explain Treatment of water for domestic supply.

UNIT-II-NANO CHEMISTRY

PART-A (2- MARKS)

1. Define the terms of Nanowire, Nanorods& Nanotubes.
2. What are the types of carbon nanotubes?
3. What are Nano-particals?
4. Define Nanoclusters.
5. List out any four applications of nano materials.

PART-B (8 MARKS)

1. Distinction between Nano Particles, Molecules and Bulk materials.
2. Define Carbon Nanotubes .Explain types and Synthesis of Carbon nano tubes.
3. Explain the Synthesis of Nano Materials by Bottom-up process.(Sol-gel and Solvothermal process)
4. Explain the Synthesis of Nano Materials by Top-up process.(Laser-ablation, CVD, Electrodeposition)
5. Explain the Application of Nano materials.

UNIT-III-PHASE RULE & COMPOSITES

PART-A (2- MARKS)

1. State Phase rule & Reduced phase rule.
2. Define Phase, Component & Degree o freedom.
3. What is Triple point & Eutectic point.
4. Define Composites.
5. What are meant by fibre, particulates, flakes &whiskers.

PART-B (8 MARKS)

1. Draw and explain the Phase diagram of water system.
2. Lets discuss in details Pb-Ag system and give its applications.
3. Explain Thermal Analysis.
3. Discuss in details of Constituents of Composites.
4. Explain the Types of Composites. (FRP)

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UNIT-IV-ENERGY RESOURCES AND STORAGE DEVICES

PART-A (2- MARKS)

1. Define Nuclear energy
2. What are Fertile and Fissile nuclides?
3. What is Super Capacitor?
4. What is Solar cell and Wind energy?
5. Define Geothermal energy

PART-B (8 MARKS)

1. Describe using a block diagram the Light water nuclear reactor for power generation.
2. Write a note on Solar Cell, Wind and Breeder reactor.
3. What are Lead accumulators? Explain the construction and functioning of Lead accumulators.
4. Explain the working of Hydrogen-oxygen fuel cell.
5. Write a short note on Lithium ion battery.
6. Explain Electric Vehicles and Plug-in Electric Vehicles.

UNIT V-FUELS AND COMBUSTION

PART-A (2- MARKS)

1. Define Cetane& Octane number of gasoline?
2. What are the classifications of Fuels?
3. Define Calorific value of fuel?
4. What is Ignition and Spontaneous ignition temperature?
5. What are Power alcohol & Bio-diesel?

PART-B (8 MARKS)

1. Explain the Manufacture of Metallurgical coke by Otto-Hoffmann method.
2. Explain proximate analysis of coal.
3. What is Synthetic petrol? How is it manufactured by Bergius process?
4. Write a detailed account on Refining of petroleum.
5. What is Flue gas analysis? Explain ORSAT method.

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