

REQUISITION LETTER

From,

Head of the Department,  
Mechanical Engineering,  
J.K.K Munirajah College of Technology,  
T.N.Palayam.

To,

The Principal,  
J.K.K Munirajah college of Technology,  
T.N.Palayam.

Respected Sir,

Sub: Seeking permission for conducting a Certificate Program-reg

We have planned to conduct a certificate Program for I and II year ME-Manufacturing and II, III and IV year BE-Mechanical students on “**CRYOGENIC HYDROGEN TECHNOLOGY**” from **19.09.2022 to 24.09.2022** by program coordinator Dr.N.SANKAR, ME, Ph.D, AP/MECH. So, I request you to kindly provide permission to conduct the certificate Program.

Thanking You,

Place: T.N.Palayam

Date: 08.09.2022

Yours Truly,

*K.S.*

*Permitted*  
*Sankar*  
*08/09/22*

*Sankar*

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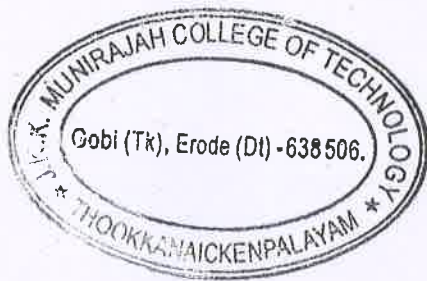


**JKKMCT/CIRCULAR/185/SEP-22**

12.09.2022

**CIRCULAR**

The Department of Mechanical Engineering is planning to organize a Value Added Course on **“CRYOGENIC HYDROGEN TECHNOLOGY”** for the benefit of the students from **19.09.2022 (Monday) to 24.09.2022 (Saturday)** Students those who are willing to attend the course can enroll their names to their class in-charges respectively on or before 16.09.2022.



*[Signature]*  
12/9/22  
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**Copy To**

**All the HODs and Staff Members,**

**All the students,**

*[Signature]*  
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**DEPARTMENT OF MECHANICAL ENGINEERING**

**ACADEMIC YEAR: 2022-2023**

**Program Name** : “CRYOGENIC HYDROGEN TECHNOLOGY”

**Program Code** : 22MECHTP01

**Program Coordinator Name:** Dr.N.SANKAR, ME, PhD, **Total Hours:** 36 hrs

**PROGRAM SYLLABUS**

**CHAPTER 1: AN OVERVIEW OF HYDROGEN TECHNOLOGY**

- ❖ Energy Vector;
- ❖ Hydrogen Technology: Applications, Advantages and Challenges
- ❖ Properties gaseous, liquid and slush hydrogen,
- ❖ Isotopes of hydrogen and their uses;
- ❖ Ortho-hydrogen and para-hydrogen

**CHAPTER 2: THERMODYNAMICS OF ELECTROLYTIC HYDROGEN PRODUCTION**

- ❖ Electrolysis
- ❖ Tank & filter Press type electrolyser
- ❖ PEM electrolysers
- ❖ H<sub>2</sub> Production
- ❖ Thermo-chemical process

**CHAPTER 3: OVERVIEW OF CRYOGENIC LIQUEFACTION CYCLES**

- ❖ Cryo-compressed gaseous hydrogen storage
- ❖ Metal hydride storage of hydrogen
- ❖ Cryosorption storage of hydrogen in carbonaceous materials
- ❖ Processing of Synthesis gas
- ❖ Auto-thermal Reactor

  
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## CHAPTER 4: LIQUEFACTION OF HYDROGEN, PROBLEMS

- ❖ Maximum inversion temperature
- ❖ Overview of cryogenic liquefaction cycles
- ❖ Problems
- ❖ Ortho-para conversion of hydrogen;
- ❖ Large scale hydrogen production process.
- ❖ Problems

## CHAPTER 5: STORAGE AND TRANSFER OF LIQUID HYDROGEN

- ❖ Storage and transfer of liquid hydrogen,
- ❖ Temperature, level and flow rate measurements
- ❖ Super-insulated vessels

## CHAPTER 6: GASIFICATION OF HYDROGEN, HYDROGEN AS FUEL

- ❖ Gasification of hydrogen,
- ❖ Hydrogen as fuel
- ❖ Safety issues on hydrogen

Prepared by:


Name : Dr.N.SANKAR, ME, PhD,

Designation : AP/MECH

  
PROGRAM COORDINATOR

  
HOD

  
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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR: 2022-2023

### PROGRAM SCHEDULE

Title of the Course : **CRYOGENIC HYDROGEN TECHNOLOGY**

Period : 19.09.2022 to 24.09.2022

Date	09:30 AM to 11:30 AM (2 Hrs)	BREAK	11.45 AM to 1.45 PM (2 Hrs)	LUNCH	2:30 PM to 4.30 PM (2 Hrs)
19.09.2022	Energy Vector; Hydrogen Technology Applications, Advantages and Challenges		Properties gaseous, liquid and slush hydrogen		Isotopes of hydrogen and their uses, Ortho- hydrogen and para- hydrogen
20.09.2022	Electrolysis Tank & filter Press type		Electrolyser PEM electrolysers H <sub>2</sub> Production		Thermo-chemical process
21.09.2022	Cryo-compressed gaseous hydrogen storage		Metal hydride storage of hydrogen, Cryosorption storage of hydrogen		Processing of Synthesis gas, Auto-thermal Reactor
22.09.2022	Maximum inversion temperature Overview of cryogenic liquefaction cycles		Problems, Ortho-para conversion of hydrogen		Large scale hydrogen production process, Problems
23.09.2022	Storage and transfer of liquid hydrogen		Temperature, level and flow rate measurements		Super-insulated vessels
24.09.2022	Gasification of hydrogen		Hydrogen as fuel		Safety issues on hydrogen

*N. Sanaed*  
PROGRAM COORDINATOR

*K. J.*  
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**DEPARTMENT OF MECHANICAL ENGINEERING**

**ACADEMIC YEAR: 2022-2023**

**RESOURCE PERSON PROFILE**

<b>Title of the Program</b>	CRYOGENIC HYDROGEN TECHNOLOGY
<b>Duration and Timing of the Program</b>	19.09.2022 to 24.09.2022
<b>Name of the Resource Person</b>	Dr.N.SANKAR, ME, PhD.,
<b>Photo Image of the Resource Person</b>	
<b>E-mail</b>	<a href="mailto:sankarn@jkkmct.edu.in">sankarn@jkkmct.edu.in</a>
<b>Mobile No:</b>	+91 8946040512
<b>Designation</b>	AP/MECH
<b>Official Address</b>	Department of Mechanical Engineering, JKKMCT, T.N.Palayam-638506, Erode (Dt)
<b>Educational Qualification</b>	B.E (Mechanical Engineering), M.E (Engineering Design) Ph.D (Manufacturing Engineering)
<b>Experience</b>	03 years of Teaching Experience as Assistant Professor and 05 years of Research Experience as Project Associate
<b>Field of Interest</b>	Hydrogen Technology, Advanced welding Process, 3D Printing and composite natural fiber composite materials.

*Sankar*  
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**DEPARTMENT OF MECHANICAL ENGINEERING**

**ACADEMIC YEAR: 2022-2023**

**CERTIFICATE PROGRAM – “CRYOGENIC HYDROGEN TECHNOLOGY”**

**STUDENT WILLING LIST**

S.NO	REGISTER NO	STUDENT NAME	WILLING STUDENTS SIGNATURE
1.	731221410001	DEEPA S	S. DEEPA
2.	731221410002	DENNIS MATHEW	D. Mathew
3.	731221410004	GOWTHAM V	V. Gowtham
4.	731221410005	GURUPRABHU K	G. Prabhuk
5.	731221410006	JENITH CHRISTOBER J	← NOT WILLING →
6.	731221410007	PERIYASAMY N	N. Periyasamy
7.	731221410008	SIVASANKAR A	A. Sivasankar
8.	731221410009	VINOTH A	A. Vinoth
9.	731222410001	JAGADEESH	J. Jagadeesh
10.	731222410002	MITTU S THAMPI	M. S. Thampi
11.	731222410003	MUKILAN S	S. Mukilan
12.	731222410004	THAMARAI SELVAN S	← NOT WILLING →
13.	731219114001	ANISHKUMAR L	L. Anishkumar
14.	731219114002	ARUNKUMAR S	S. Arunkumar
15.	731219114003	BALAMURUGAN V	V. Balamurugan

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16.	731219114005	DHARMARAJ M	Dharmaraj M
17.	731219114006	DINESH S	S. Dinesh
18.	731219114007	DINESH KUMAR R	R. Dinesh
19.	731219114009	KARTHI M	M. Karthi
20.	731219114011	KAVINKUMAR M	M. Kavinkumar
21.	731219114013	MANOJ J	J. Manoj
22.	731219114014	MANO RANJITH K	← NOT WILLING →
23.	731219114015	MURUGESH M	M. Murugesan
24.	731219114019	SHANKER GANESH K	Shankar Ganesh K
25.	731219114021	SATHISH KUMAR S	S. Sathish
26.	731219114022	SIVANANTH K	Sivananth K
27.	731219114023	THAMARAI SELVAN	Thamarai Selvan
28.	731219114024	VIGNESH P	P. Vignesh
29.	731219114027	YOKESH E	Yokesh E
30.	731219114501	DINESH KUMAR B	B. Dinesh
31.	731220114001	JAGANKUMAR S	← NOT WILLING →
32.	731220114002	KODEESWARAN S	S. Kodeeswaran
33.	731220114003	KUMARAVEL M	M. Kumaravel
34.	731220114004	MAHENDRAN D	Mahendran D
35.	731220114005	MANIKANDAN S	Manikandan S

  
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36.	731220114006	PARTHIPAN M	M. Parthi
37.	731220114007	RAMESH B	B. Ramesh
38.	731220114008	RAVINDRAN L	← NOT WILLING →
39.	731220114010	SENTHILKUMAR G	G. Senthilkumar
40.	731220114011	THIRUMURUGAN M	M. Thirumurugan
41.	731220114012	THIRUNAVUKKARASU S	S. Thirunavukkarasu
42.	731220114013	VELLINGIRI A	A. Vellingiri
43.	731220114301	GOWRISANKAR M	M. Gowrisankar
44.	731220114302	KAVIN A	A. Kavin
45.	731220114501	PALANIKUMAR M	M. Palanikumar
46.	731221114003	BHUVANESWARAN M	← NOT WILLING →
47.	731221114004	MATHANKUMAR M	M. Mathankumar
48.	731221114005	PRABAKARAN S	S. Prabakaran
49.	731221114008	SATHEESH C	C. Satheesh
50.	731221114009	VAIRAMUTHU S	S. Vairamuthu
51.	731221114010	VIGNESH S	S. Vignesh

*N. Sanceep*  
PROGRAM COORDINATOR

*K. S.*  
HOD

*S. S.*  
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**DEPARTMENT OF MECHANICAL ENGINEERING**

**ACADEMIC YEAR: 2022-2023**

**ENROLLED STUDENTS NAME LIST**

S.NO	REGISTER NO	STUDENT NAME
1.	731221410001	DEEPA S
2.	731221410002	DENNIS MATHEW
3.	731221410004	GOWTHAM V
4.	731221410005	GURUPRABHU K
5.	731221410007	PERIYASAMY N
6.	731221410008	SIVASANKAR A
7.	731221410009	VINOTH A
8.	731222410001	JAGADEESH
9.	731222410002	MITTU S THAMPI
10.	731222410003	MUKILAN S
11.	731219114001	ANISHKUMAR L
12.	731219114002	ARUNKUMAR S
13.	731219114003	BALAMURUGAN V
14.	731219114005	DHARMARAJ M
15.	731219114006	DINESH S
16.	731219114007	DINESH KUMAR R
17.	731219114009	KARTHI M

  
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18.	731219114011	KAVINKUMAR M
19.	731219114013	MANOJ J
20.	731219114015	MURUGESH M
21.	731219114019	SHANKER GANESH K
22.	731219114021	SATHISH KUMAR S
23.	731219114022	SIVANANTH K
24.	731219114023	THAMARAI SELVAN
25.	731219114024	VIGNESH P
26.	731219114027	YOKESH E
27.	731220114001	JAGANKUMAR S
28.	731220114002	KODEESWARAN S
29.	731220114003	KUMARAVEL M
30.	731220114004	MAHENDRAN D
31.	731220114005	MANIKANDAN S
32.	731220114006	PARTHIPAN M
33.	731220114007	RAMESH B
34.	731220114010	SENTHILKUMAR G
35.	731220114011	THIRUMURUGAN M
36.	731220114012	THIRUNAVUKKARASU S
37.	731220114013	VELLINGIRI A

  
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38.	731220114301	GOWRISANKAR M
39.	731220114302	KAVIN A
40.	731220114501	PALANIKUMAR M
41.	731221114004	MATHANKUMAR M
42.	731221114005	PRABAKARAN S
43.	731221114008	SATHEESH C
44.	731221114009	VAIRAMUTHU S
45.	731221114010	VIGNESH S

*N. Saneel*  
**PROGRAM COORDINATOR**

*K. J.*  
**HOD**

*[Signature]*  
**PRINCIPAL**

*[Signature]*  
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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR: 2022-2023

### CERTIFICATE PROGRAM ON "CRYOGENIC HYDROGEN TECHNOLOGY"- ATTENDANCE SHEET

Schedule Period: 19.09.2022 TO 24.09.2022

S.NO	NAME OF THE STUDENT	ATTENDANCE OF THE PARTICIPANTS											
		19/9/22		20/9/22		21/9/22		22/9/22		23/9/22		24/9/23	
		FN	AN	FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
<b>ME- I YEAR</b>													
1.	DEEPA S	/	/	/	/	/	/	/	/	/	/	/	/
2.	DENNIS MATHEW	/	/	/	/	/	/	/	/	/	/	/	/
3.	GOWTHAM V	/	/	/	/	/	/	/	/	/	/	/	/
4.	GURUPRABHU K	/	/	/	/	/	/	/	/	/	/	/	/
5.	PERIYASAMY N	/	/	/	/	a	a	/	/	/	/	a	a
6.	SIVASANKAR A	/	/	/	/	/	/	/	/	/	/	/	/
7.	VINOTH A	/	/	/	/	/	/	/	/	/	/	/	/
<b>ME- II YEAR</b>													
8.	JAGADEESH	/	/	/	/	/	/	/	/	/	/	/	/
9.	MITTU S THAMPI	/	/	/	/	/	/	/	/	/	/	/	/
10.	MUKILAN S	/	/	/	/	/	/	/	/	/	/	/	/

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BE- II YEAR													
11.	MATHANKUMAR M	/	/	a	a	/	/	a	a	a	a	/	/
12.	PRABAKARAN S	/	/	/	/	/	/	/	/	/	/	/	/
13.	SATHEESH C	/	/	/	/	/	/	/	/	/	/	/	/
14.	VAIRAMUTHU S	/	/	/	/	/	/	/	/	/	/	/	/
15.	VIGNESH S	/	/	/	/	/	/	/	/	/	/	/	/
BE-III YEAR													
16.	JAGANKUMAR S	/	/	/	/	/	/	/	/	/	/	/	/
17.	KODEESWARAN S	a	a	/	/	a	a	/	/	a	a	/	/
18.	KUMARAVEL M	/	/	/	/	/	/	/	/	/	/	/	/
19.	MAHENDRAN D	/	/	/	/	/	/	/	/	/	/	/	/
20.	MANIKANDAN S	/	/	/	/	/	/	/	/	/	/	/	/
21.	PARTHIPAN M	/	/	/	/	/	/	/	/	/	/	/	/
22.	RAMESH B	/	/	/	/	/	/	/	/	/	/	/	/
23.	SENTHILKUMAR G	/	/	/	/	/	/	a	/	/	/	/	/
24.	THIRUMURUGAN M	/	/	/	/	/	/	/	/	/	/	/	/
25.	THIRUNAVUKKARASU S	/	/	/	/	/	/	/	/	/	/	/	/
26.	VELLINGIRI A	/	/	/	/	/	/	/	/	/	/	/	/
27.	GOWRISANKAR M	/	a	/	/	/	/	/	/	/	/	/	/
28.	KAVIN A	/	/	/	/	/	/	/	/	/	/	/	/
29.	PALANIKUMAR M	/	/	/	/	/	/	/	/	/	/	/	/
BE-IV YEAR													
30.	ANISHKUMAR L	/	/	/	/	/	/	/	/	/	/	/	/
31.	ARUNKUMAR S	/	/	/	/	/	/	/	/	/	/	/	/
32.	BALAMURUGAN V	/	/	/	/	/	/	/	/	/	/	/	/

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33.	DHARMARAJ M	/	/	/	/	/	/	/	/	/	/	/
34.	DINESH S	/	/	/	/	/	/	/	/	/	/	/
35.	DINESH KUMAR R	/	/	/	/	/	/	/	/	/	/	/
36.	KARTHI M	a	a	/	/	a	a	/	/	a	a	/
37.	KAVINKUMAR M	/	/	/	/	/	/	/	/	/	/	/
38.	MANOJ J	/	/	/	/	/	/	/	a	/	/	/
39.	MURUGESH M	/	/	/	/	/	/	/	/	/	/	/
40.	SHANKER GANESH K	/	/	/	/	/	/	/	/	/	/	/
41.	SATHISH KUMAR S	/	/	/	/	/	/	/	/	/	/	/
42.	SIVANANTH K	/	/	a	a	a	a	/	/	/	/	a
43.	THAMARAI SELVAN	/	/	/	/	/	/	/	/	/	/	/
44.	VIGNESH P	/	/	/	/	/	/	/	/	/	/	/
45.	YOKESH E	/	/	/	/	/	/	/	/	/	/	/

*N. Saneef*  
PROGRAM COORDINATOR

*[Signature]*  
HOD

*[Signature]*  
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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR: 2022-2023

### ASSESSMENT- CRYOGENIC HYDROGEN TECHNOLOGY

ANSWER ALL THE QUESTIONS

(15x2=30 MARKS)

1. What is hydrogen's role as an energy vector?
  - A) Energy source
  - B) Energy storage
  - C) Energy carrier
  - D) Energy converter
2. What is a major challenge associated with hydrogen technology?
  - A) High efficiency
  - B) Limited applications
  - C) Low abundance
  - D) Easy storage
3. At what temperature does hydrogen exist in a slush state?
  - A) Below  $-253^{\circ}\text{C}$
  - B) Between  $-259^{\circ}\text{C}$  and  $-253^{\circ}\text{C}$
  - C) Above  $-259^{\circ}\text{C}$
  - D) Exactly  $-259^{\circ}\text{C}$
4. Which isotope of hydrogen is commonly used in nuclear fusion reactions?
  - A) Hydrogen-1
  - B) Hydrogen-2
  - C) Hydrogen-3
  - D) Hydrogen-4
5. What is the main difference between ortho-hydrogen and para-hydrogen?
  - A) Spin orientations
  - B) Isotopic composition
  - C) Temperature stability
  - D) Chemical reactivity

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6. What is the primary process for producing hydrogen through electrolysis?
  - A) Combustion
  - B) Pyrolysis
  - C) Photolysis
  - D) Decomposition
  
7. What does PEM stand for in the context of electrolyzers?
  - A) Proton Exchange Membrane
  - B) Polymer Electrolyte Matrix
  - C) Pressurized Electrolysis Module
  - D) Power Efficiency Mechanism
  
8. What is an alternative name for cryo-compressed gaseous hydrogen storage?
  - A) Liquid Hydrogen Storage
  - B) High-Pressure Hydrogen Storage
  - C) Supercritical Hydrogen Storage
  - D) Cryogenic Hydrogen Storage
  
9. What is the storage medium in metal hydride storage systems?
  - A) Liquid hydrogen
  - B) Solid-state hydrogen
  - C) Gaseous hydrogen
  - D) Aqueous hydrogen
  
10. What is the maximum inversion temperature in the liquefaction of hydrogen?
  - A)  $-259^{\circ}\text{C}$
  - B)  $-253^{\circ}\text{C}$
  - C)  $-252^{\circ}\text{C}$
  - D)  $-246^{\circ}\text{C}$
  
11. What process is responsible for ortho-para conversion of hydrogen molecules?
  - A) Radiolysis
  - B) Photoionization
  - C) Isomerization
  - D) Ionization

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**12. What is a common method for super-insulating vessels used in liquid hydrogen storage?**

- A) Vacuum insulation
- B) Thermal conduction
- C) Radiant barrier
- D) Air-filled insulation

**13. What does gasification of hydrogen involve?**

- A) Conversion to a liquid state
- B) Conversion to a gaseous state
- C) Conversion to a solid state
- D) Conversion to a supercritical state

**14. In what form is hydrogen primarily used as a fuel?**

- A) Gaseous
- B) Liquid
- C) Solid
- D) Aqueous


**15. What is a significant concern related to the safety of hydrogen?**

- A) High ignition temperature
- B) Low flammability
- C) Lack of toxicity
- D) Spontaneous decomposition

  
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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR: 2022-2023

### STUDENTS MARK LIST

S.NO	REGISTER NO	STUDENT NAME	MARK
1.	731221410001	DEEPA S	93
2.	731221410002	DENNIS MATHEW	87
3.	731221410004	GOWTHAM V	67
4.	731221410005	GURUPRABHU K	73
5.	731221410007	PERIYASAMY N	<u>35</u>
6.	731221410008	SIVASANKAR A	73
7.	731221410009	VINOTH A	87
8.	731222410001	JAGADEESH	60
9.	731222410002	MITTU S THAMPI	67
10.	731222410003	MUKILAN S	87
11.	731219114001	ANISHKUMAR L	60
12.	731219114002	ARUNKUMAR S	67
13.	731219114003	BALAMURUGAN V	78
14.	731219114005	DHARMARAJ M	73
15.	731219114006	DINESH S	74
16.	731219114007	DINESH KUMAR R	67
17.	731219114009	KARTHI M	<u>38</u>

  
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19.	731219114013	MANOJ J	93
20.	731219114015	MURUGESH M	85
21.	731219114019	SHANKER GANESH K	73
22.	731219114021	SATHISH KUMAR S	87
23.	731219114022	SIVANANTH K	<u>40</u>
24.	731219114023	THAMARAI SELVAN	87
25.	731219114024	VIGNESH P	73
26.	731219114027	YOKESH E	87
27.	731220114001	JAGANKUMAR S	73
28.	731220114002	KODEESWARAN S	<u>47</u>
29.	731220114003	KUMARAVEL M	88
30.	731220114004	MAHENDRAN D	87
31.	731220114005	MANIKANDAN S	73
32.	731220114006	PARTHIPAN M	87
33.	731220114007	RAMESH B	73
34.	731220114010	SENTHILKUMAR G	75
35.	731220114011	THIRUMURUGAN M	73
36.	731220114012	THIRUNAVUKKARASU S	87
37.	731220114013	VELLINGIRI A	73

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39.	731220114302	KAVIN A	73
40.	731220114501	PALANIKUMAR M	73
41.	731221114004	MATHANKUMAR M	<u>40</u>
42.	731221114005	PRABAKARAN S	93
43.	731221114008	SATHEESH C	87
44.	731221114009	VAIRAMUTHU S	88
45.	731221114010	VIGNESH S	73

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## DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR: 2022-2023

### SUMMARY/ OUTCOME REPORT

Name of the Certificate Course : **CRYOGENIC HYDROGEN TECHNOLOGY**

Course Code : **21MECHCHT01**

Name of the Course Coordinator : Dr.N.SANKAR,M.E, PhD,

I hereby affirm that the entire course contents in the Certificate Program “**CRYOGENIC HYDROGEN TECHNOLOGY**” listed in the Add on course Syllabus have been actually performed by the students as the part of the prescribed co-curricular activities through Add on course.

I confirmed that the Certificate Course title as **CRYOGENIC HYDROGEN TECHNOLOGY** was done by me in the beginning of this semester and course delivery with attendance of the students were recorded.

I confirmed that all registered students for this Certificate Course were actively attended and performed well throughout the duration of this course. And all students were successfully completed and eligible to receive the participation certificate.

#### OUTCOME:

- Students shall be able to gain the knowledge in temperature-dependent properties of hydrogen for its design and simulation at the system and component levels.
- This course provides a consolidated overview of cryogenic hydrogen production, storage, transportation, and its end use.
- Students shall be able to gain the knowledge of handling cryo-hydrogen with necessary precautions.

Signature :

Name : Dr.N.SANKAR,M.E, PhD

Designation :Assistant Professor/Mech

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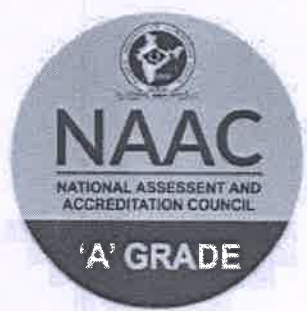


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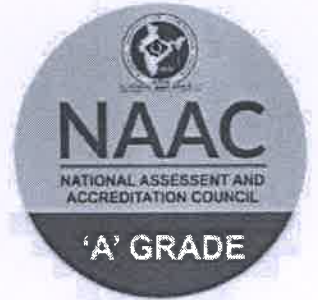
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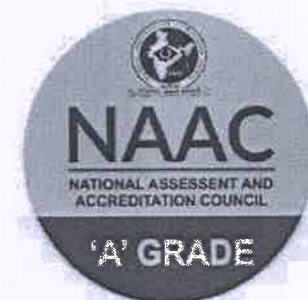
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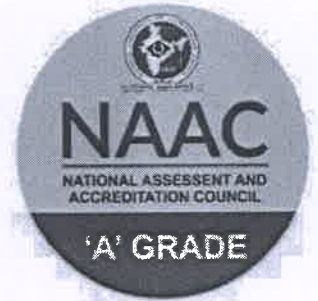
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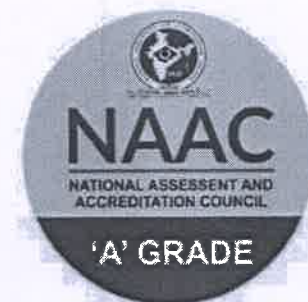
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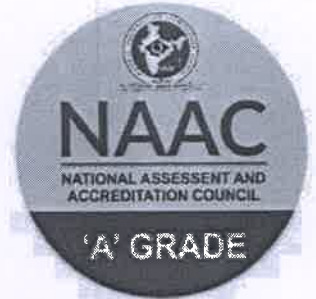
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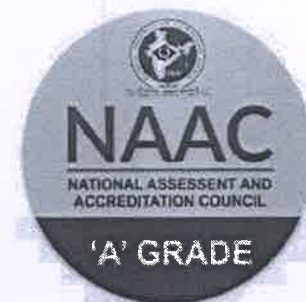
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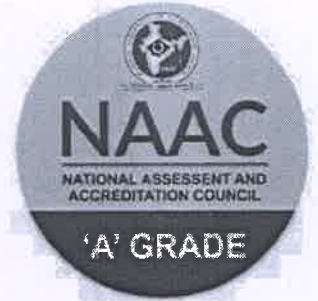
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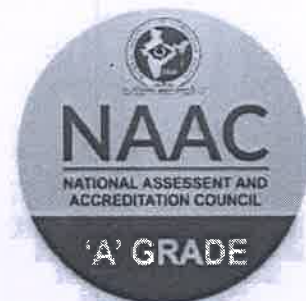
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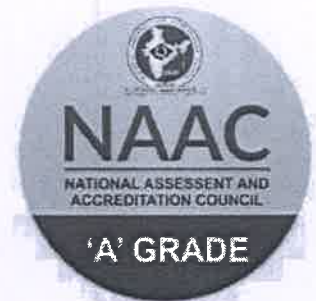
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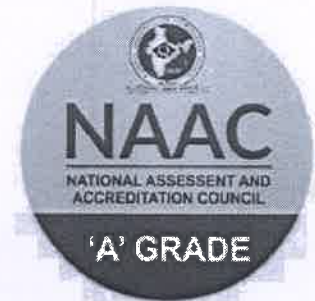


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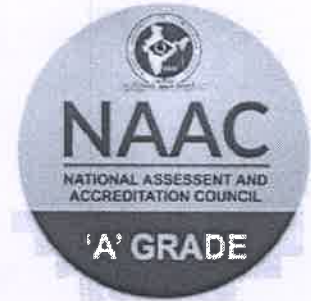


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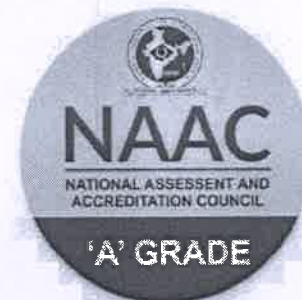
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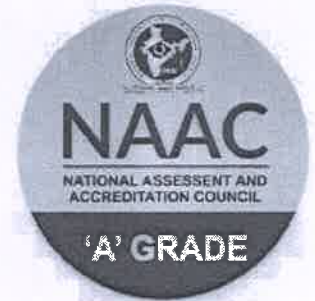
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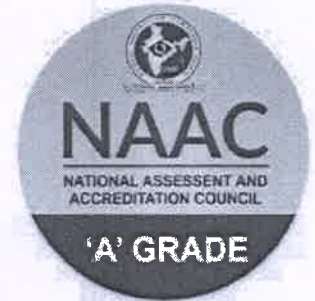
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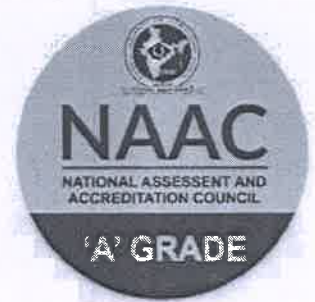
**DR K SRIDHARAN**  
Principal  
JKKMCT



# CERTIFICATE

OF PARTICIPATION

PROUDLY PRESENTED TO



**KUMARAVEL M**

Had successfully completed certificate program on  
"CRYOGENIC HYDROGEN TECHNOLOGY" organized by The Department of  
Mechanical Engineering, J.K.K MUNIRAJH COLLEGE OF TECHNOLOGY,  
T.N Palayam, Erode on *19.09.2022 to 24.09.2022.*

**DR N SANKAR**  
Faculty Coordinator  
JKKMCT

**MR K SRIRAM**  
Hod MECH  
JKKMCT

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

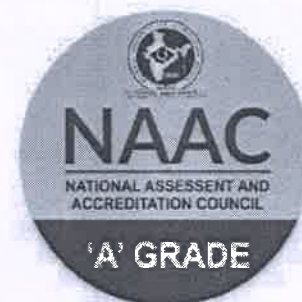
**DR K SRIDHARAN**  
Principal  
JKKMCT



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PROUDLY PRESENTED TO



**MAHENDRAN D**

Had successfully completed certificate program on  
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Mechanical Engineering, J.K.K MUNIRAJH COLLEGE OF TECHNOLOGY,  
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**DR N SANKAR**  
Faculty Coordinator  
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**MR K SRIRAM**  
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**OF TECHNOLOGY**  
T.N. PALAYAM (Po)-638 506.  
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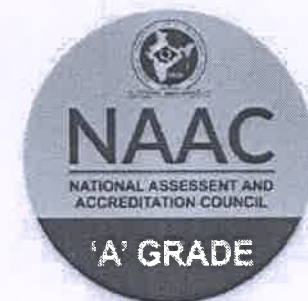
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JKKMCT



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**MANIKANDAN S**

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Faculty Coordinator  
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JKKMCT

**PRINCIPAL**  
**JKK MUNIRAJAH COLLEGE**  
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T.N. PALAYAM (P)-638506.  
GOBI (Tk), ERODE (Dt).

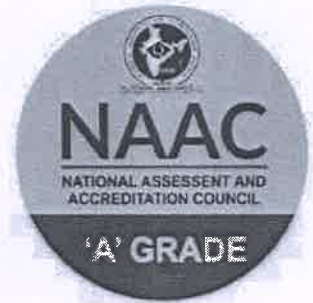
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T.N. PALAYAM (Po)-638 506.  
GOSI (Tk), ERODE (Dt).

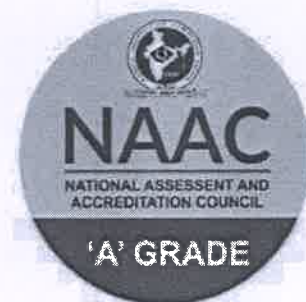
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T.N. PALAYAM (Po)-638 506.  
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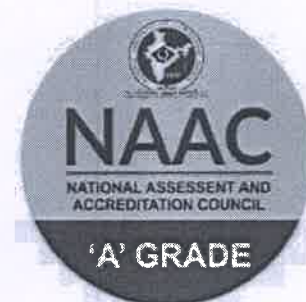
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JKKMCT

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**OF TECHNOLOGY**  
**T.N. PALAYAM (Po)-638 508.**  
**GOBI (Tk), ERODE (Dt).**

**DR K SRIDHARAN**  
Principal  
JKKMCT

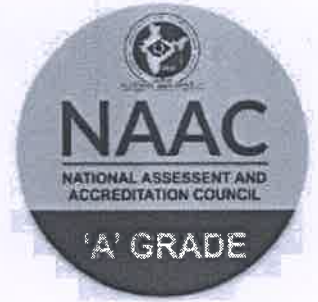


# CERTIFICATE

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**MURUGESH M**



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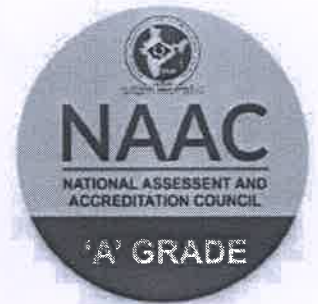
**DR K SRIDHARAN**  
Principal  
JKKMCT



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PROUDLY PRESENTED TO



**PALANIKUMAR M**

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T.N. PALAYAM (Po)-638 508.  
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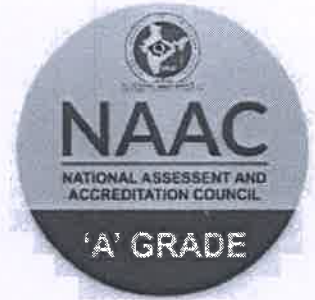
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Principal  
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**PARTHIPAN M**

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Faculty Coordinator  
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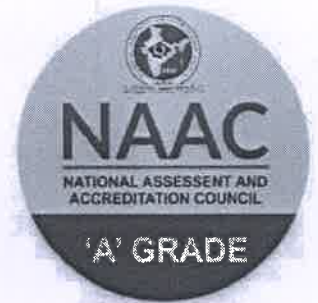
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Principal  
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**PRABAKARAN S**

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Faculty Coordinator  
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Principal  
JKKMCT

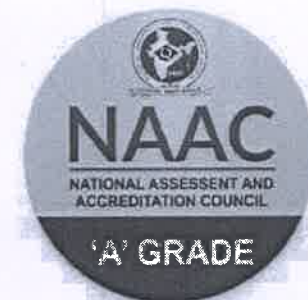


# CERTIFICATE

OF PARTICIPATION

PROUDLY PRESENTED TO

**RAMESH B**



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“**CRYOGENIC HYDROGEN TECHNOLOGY**” organized by The Department of  
Mechanical Engineering, J.K.K MUNIRAJH COLLEGE OF TECHNOLOGY,  
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Hod MECH  
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T.N. PALAYAM (Po)-638 508.  
GOBI (Tk), ERODE (Dt).

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Principal  
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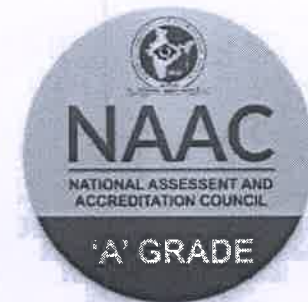


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**SATHEESH C**



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Mechanical Engineering, **J.K.K MUNIRAJH COLLEGE OF TECHNOLOGY,**  
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Faculty Coordinator  
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**MR K SRIRAM**  
Hod MECH  
JKKMCT

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

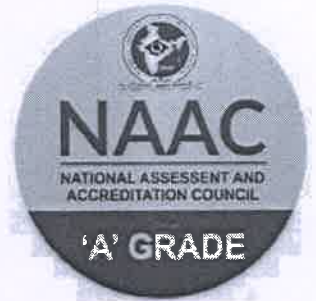
**DR K SRIDHARAN**  
Principal  
JKKMCT



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**SATHISH KUMAR S**

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Mechanical Engineering, **J.K.K MUNIRAJH COLLEGE OF TECHNOLOGY,**  
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JKKMCT

**MR K SRIRAM**  
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**JKK MUNIRAJAH COLLEGE**  
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T.N. PALAYAM (Po)-638 508.  
GOBI (Tk), ERODE (Dt).

**DR K SRIDHARAN**  
Principal  
JKKMCT

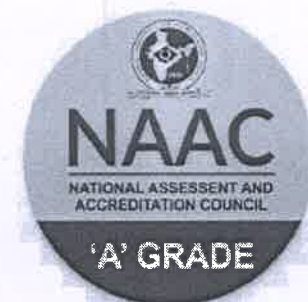


# CERTIFICATE

OF PARTICIPATION

PROUDLY PRESENTED TO

**SENTHILKUMAR G**



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“CRYOGENIC HYDROGEN TECHNOLOGY” organized by The Department of  
Mechanical Engineering, J.K.K MUNIRAJH COLLEGE OF TECHNOLOGY,  
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Faculty Coordinator  
JKKMCT

**MR K SRIRAM**  
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**PRINCIPAL**  
JKK MUNIRAJAH COLLEGE  
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GOBI (Tk), ERODE (Dt).

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Principal  
JKKMCT

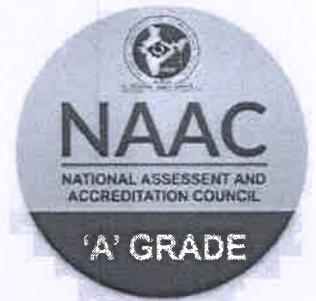


# CERTIFICATE

OF PARTICIPATION

PROUDLY PRESENTED TO

**SHANKER GANESH K**



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“**CRYOGENIC HYDROGEN TECHNOLOGY**” organized by The Department of  
Mechanical Engineering, J.K.K MUNIRAJH COLLEGE OF TECHNOLOGY,  
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**DR N SANKAR**  
Faculty Coordinator  
JKKMCT

**MR K SRIRAM**  
Hod MECH  
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**PRINCIPAL**  
JKK MUNIRAJAH COLLEGE  
OF TECHNOLOGY  
T.N. PALAYAM (Po)-638 506.  
GOBI (Tk). ERODE (Dt).

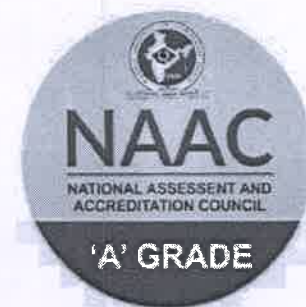
**DR K SRIDHARAN**  
Principal  
JKKMCT



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**SIVASANKAR A**

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**DR K SRIDHARAN**  
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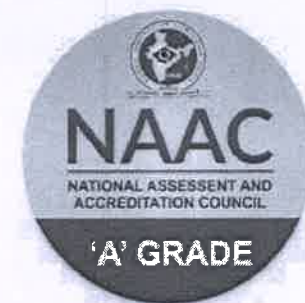


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**THAMARAI SELVAN V**



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Faculty Coordinator  
JKKMCT

**MR K SRIRAM**  
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Principal  
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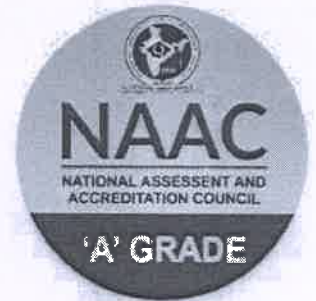


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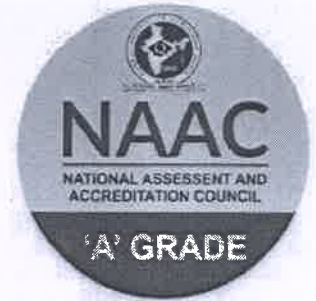


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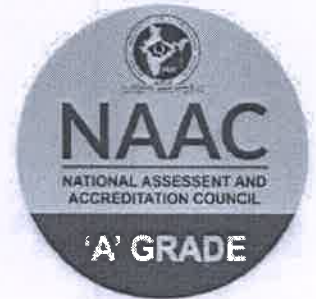
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**VAIRAMUTHU S**

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Faculty Coordinator  
JKKMCT

**MR K SRIRAM**  
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JKKMCT

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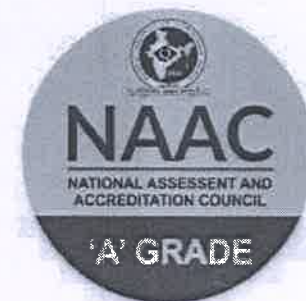
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Principal  
JKKMCT



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**VELLINGIRI A**

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T.N. PALAYAM (Po)-638 506.  
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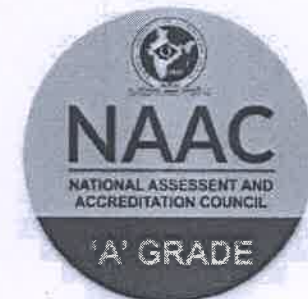
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Principal  
JKKMCT



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**VIGNESH P**

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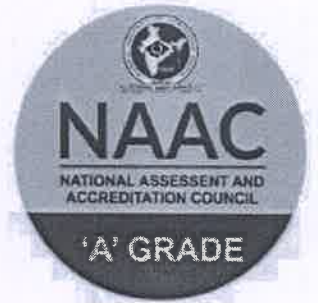
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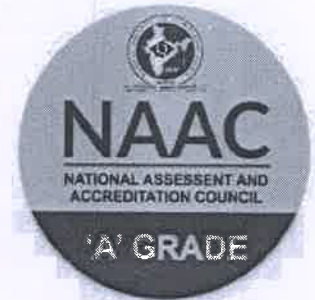
**DR K SRIDHARAN**  
Principal  
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# CERTIFICATE

OF PARTICIPATION

PROUDLY PRESENTED TO



**YOKESH E**

Had successfully completed certificate program on  
"CRYOGENIC HYDROGEN TECHNOLOGY" organized by The Department of  
Mechanical Engineering, J.K.K MUNIRAJH COLLEGE OF TECHNOLOGY,  
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