ESWAR COLLEGE OF ENGINEERING: NARASARAOPET

Approved by AICTE, New Delhi., Affiliated to JNTUK, Kakinada
Kesanupalli Village, Narasaraopet – 522 601,
Palnadu Dist. A.P.

Phone No. 9121214708 | Email ID: principal@eswarcollegeofengg.org, eswarcollegeofengg@gmail.com

web:eswarcollegeofengg.org

Department of Mechanical Engineering

Date : 19-04-2023.

To
The Principal
Eswar College of Engineering
Narasaraopet

Through HOD-ME

From
K. Musalaiah.
Assistant Professor
Faculty Coordinator

Sub: Requesting for permission to conduct a value-added course on Rocket Engines : from 24/4/23 to 29/4/23.

Dear Sir,

The Department of ME is planning to organize a 1 week value-added course on Rocket Engines : from 24/4/23 to 29/4/23.

Total Number of Students registered: 12 No's (III B.Tech II Sem ME).

Resource Person: P.Pulla rao

Certificate Criteria: 60% of marks in Evaluation, 80% of attendance

In connection with the programme, we request your approval to organize the same and to make the programme a grand success.

Thanks and regards,

Name : K. Musalaiah

Signature

.....

HOD- Comments – Requesting to Recommended

Principal Comments: Recommended

Approved/ Rejected

19/4/23

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Kesanupalli (V), Narasaraopet - 522549. www.eswarcollegeofengg.org

+91 98855 78652
+91 99636 34414
Email: eswarcollegeofengg@gmail.com
Website: www.eswarcollegeofengg.org

Date: 20-04-2023

CIRCULAR

All B.Tech III-II Mechanical students are hereby notified that a value added course titled "Rocket engines" will be conducted from 24-04-2023 to 29-04-2023. It is mandatory for all students to enroll their names with course co-ordination K. Musalaiah, Assistant Professor, Department of Mechanical Engineering.

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ONE WEEK WORKSHOP ON "ROCKET ENGINES"

(24-04-2023 TO 29-04-2023)

ESWAR COLLEGE OF ENGINEERING
Kesanupalli (V), Narasaraopet - 522 601

Registration Form

Name:_____

Department:_____

Designation:_____

Organisation:_____

Address: _____

Contact No.:_____

E-mail:_____

CERTIFICATE

This is certified that,Mr./Mrs./._____ is nominated for attending One Week National Workshop On "Rocket Engines" at Eswar College of Engineering, Kesanupalli(V), Narasaraopet(M),Guntur-Dt.On 24/4/23 to 29/4/23

Signature of the Candidate

Signature of the HOD/Principal With Seal

A. ABOUT ESWAR COLLEGE OF ENGINEERING

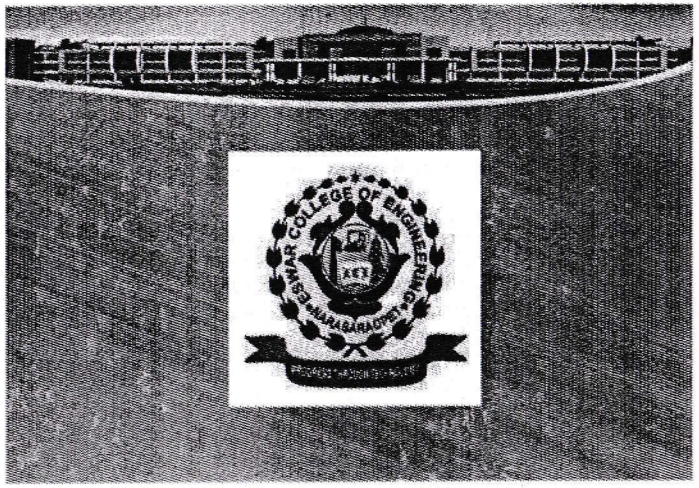
Eswar College of Engineering was established during the academic year 2008 -09 and sponsored by Shaik Dada Saheb Charitable Trust, with a vision of Imparting futuristic technical education and instill high patterns of discipline in order to set global standards and making the students technologically superior and ethically strong. The young and dynamic promoters have selected this rural area with lot of foresight. The Institution is spread over 22 acres of lush green landscape and located at 5th km stone on the Narasaraopet– Chilakaluripet Road. The Institution offers the UG Courses B.Tech-CIVIL, EEE, ECE, CSE, AME, ME, PG Courses M.Tech-PE&ED,DECS,CSE,CAD/CAM & MBA. The tourist places near by are Kotappakonda, Amaravathi, Surylanka Beach. **Eswar College of Engineering is having MOU with International Institute of Information Technology IIIT-Hyderabad and introduced CIT Programme for students Digital Class facility is also provided in association with Manipal K12, Bangalore**, the very first college in Andhra Pradesh

Address for Correspondence:
The Co-Ordinator,
ONE WEEK WORKSHOP ON "ROCKET ENGINES"
ESWAR COLLEGE OF ENGINEERING,
KESANUPALLI (V).
NARASARAOPET (M),
GUNTUR-DT,
E-mail:eswarcollegeofengg@gmail.com
Ph.No. +91 8985793922/9581741110

PRINCIPAL
ESWAR COLLEGE OF ENGINEERING
NARASARAOPET-522 601, Guntur (Dt

ONE WEEK WORKSHOP ON "ROCKET ENGINES"

24-04-2023 TO 29-04-2023



Organized by

DEPARTMENT OF MECHANICAL ENGINEERINGESWAR COLLEGE OF ENGINEERING
Kesanupalli (V), Narasaraopet-522 601

INTRODUCTION:

A rocket engine uses stored rocket propellants as the reaction mass for forming a high-speed propulsive jet of fluid, usually high-temperature gas. Rocket engines are reaction engines, producing thrust by ejecting mass rearward, in accordance with Newton's third law.

SCHEDULE OF THE PROGRAMME:

S.NO	Day-Wise	Course Content
1	Day-1	• Introduction, Types of Rocket Engines, Applications of Rocket Engines • Aerothermodynamics of Rocket Engines, Fundamentals of Aerodynamics, Elements of Thermodynamics
2	Day-2	• Combustion, Ideal Rocket Engine • Thrust Equation, Rocket Engine parameters, Rocket Engine Nozzles
3	Day-3	• Space Flight Performance, Rocket Propellant • Introduction to Solid Propellant Rocket Engine, Components of SPRE, Regression rate relation
4	Day-4	• Liquid Propellant Rocket Engine, Injector, Feed system • Hybrid rocket Engine, Rocket Heat transfer
5	Day-5	• Liquid Propellant Rocket Engine, Types of liquid rocket engines, Combustion of liquid propellant • Combustion Chamber Geometry, Types of liquid rocket engines, Injectors,Feed system
6	Day-6	• Combustion Instability, Ignition System, Hybrid rocket Engine • Rocket Heat transfer, Types of Cooling System

WORKSHOP: The objective of workshop is to seethat the students are well trained for the Prerequisite courses of certification

Objectives:

- The main objective of the F-1 rocket engine was to supply thrust that could be used to launch space rockets.

Training Methodology:

- offline

RESOURCE PERSONS:

E.PULLA RAO,

ESWAR COLLEGE OF ENGINEERING

Application in the prescribed format duly sponsored by the Head of Dept/Institution or scanned copy of the application form may also be send through E-mail to the Co-ordinator so as to reach on or before 21-04-2023. It is mandatory that the faculty/students applied for workshop must attend the course if selected. Participation certificate will be issued. No Accommodation.

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DR.G. NAGA MALLESWARA RAO
Principal

Convener
Sri. K.MUSALAIAH,
HOD-ME Department,
Ph: 9618777974.

CO-ORDINATOR

Sri. K.MUSALAIAH,
HOD-ME Department,
Ph: 9618777974

ORGANISING COMMITTEE:

Sri. SK.C.M.SUBHANI, *M.Tech,*
Asst.Prof
ME Department, ph : 7702801917

Sri. P.SASIDHAR, *M.Tech,* Asst.Prof
ME Department, Ph: 8309129682

Sri. K.JHANSI RANI, *M.Tech,* Asst.ProfME Department,
Ph: 98341495620

SEND YOUR ENTRIES TO :

The Co-Ordinator,
ONE WEEK WORKSHOP ON "ROCKET ENGINES"
ESWAR COLLEGE OF ENGINEERING,
KESANUPALLI (V),
NARASARAOPET (M), GUNTUR-DT
Ph.No: 8985793922, 9581741110
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	web:eswarcollegeofengg.org

Department of Mechanical Engineering

Course Name: Value Added Course on Rocket Engines

Proposed Syllabus

Week 1: Introduction, Types of Rocket Engines, Applications of Rocket Engines

Week 2: Aerothermodynamics of Rocket Engines, Fundamentals of Aerodynamics, Elements of Thermodynamics

Week 3: Combustion, Ideal Rocket Engine

Week 4: Thrust Equation, Rocket Engine parameters, Rocket Engine Nozzles

Week 5: Space Flight Performance, Rocket Propellant

Week 6: Introduction to Solid Propellant Rocket Engine, Components of SPRE, Regression rate relation

Week 7: Liquid Propellant Rocket Engine, Injector, Feed system

Week 8: Hybrid rocket Engine, Rocket Heat transfer

Week 9: Liquid Propellant Rocket Engine, Types of liquid rocket engines, Combustion of liquid propellant

Week 10: Combustion Chamber Geometry, Types of liquid rocket engines, Injectors,Feed system

Week 11: Combustion Instability, Ignition System, Hybrid rocket Engine

Week 12: Rocket Heat transfer, Types of Cooling System

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CO Statements

CO1	Understand the operating principle of the rocket and spacecraft propulsion systems.
CO2	Develop the expressions for the performance parameters such as thrust, specific impulse.
CO3	Develop the expressions for the performance parameters thrust coefficient, characteristic velocity, etc.,
CO4	Interpret the influence of atmospheric conditions on the performance parameters of the rocket and spacecraft propulsion systems.
CO5	Distinguish solid rocket motor, liquid propellant rocket, and hybrid rocket motor in terms of general characteristics, propellant properties with its relative advantages and disadvantages
CO6	Demonstrate the working principle with relative advantages and disadvantages of advanced propulsion systems such as electric propulsion and nuclear propulsion

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Department of Mechanical Engineering

Feedback form

Course Name: Value Added Course on Rocket Engines

Please place tick marks at the respective column

S.No	Particulars	Excellent	Very good	Good	Average	Poor
1	How well did you achieve this learning goal in this course?	✓				
2	The course contain meet the expectation	✓				
3	The lecture sequence was well planned	✓				
4	Lecture content illustrated with adequate examples	✓				
5	Level of the course up to the mark?		✓			
6	Course highlights the level of new knowledge		✓			
7	The lecture was clear and easy to understand?	✓				
8	Teaching aids are effectively used?		✓			
9	The resource person interacted well and cleared the doubts.		✓			
10	Overall organization of the course		✓			

Comments

1.

2.

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S. Nagur

Signature of the student

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Department of Mechanical Engineering

Feedback form

Course Name: Value Added Course on Rocket Engines

Please place tick marks at the respective column

S.No	Particulars	Excellent	Very good	Good	Average	Poor
1	How well did you achieve this learning goal in this course?		✓			
2	The course contain meet the expectation	✓				
3	The lecture sequence was well planned	✓				
4	Lecture content illustrated with adequate examples		✓			
5	Level of the course up to the mark?	✓				
6	Course highlights the level of new knowledge		✓			
7	The lecture was clear and easy to understand?	✓				
8	Teaching aids are effectively used?		✓			
9	The resource person interacted well and cleared the doubts.	✓				
10	Overall organization of the course	✓				

Comments

1.

2.

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P. Akhil

Signature of the student

Phone No.
9121214708

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web:eswarcollegeofengg.org

Department of Mechanical Engineering

Feedback Analysis

Course Name: ROCKET ENGINES

Number of students attended/ given feedback 12

S.No	Particulars	Excellent	Very good	Good	Average	Poor	levels
1	How well did you achieve this learning goal in this course?	6	6				0.875
2	The course contain meet the expectation	7	4	1			0.875
3	The lecture sequence was well planned	5	5	2			0.8125
4	Lecture content illustrated with adequate examples	6	4	2			0.83333
5	Level of the course up to the mark?	8	4				0.91667
6	Course highlights the level of new knowledge	9	3				0.9375
7	The lecture was clear and easy to understand?	8	4				0.91667
8	Teaching aids are effectively used?	7	5				0.89583
9	The resource person interacted well and cleared the doubts.	6	6				0.875
10	Overall organization of the course	7	5				0.89583
							0.88333

Over all feedback value : 3.533333333

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Department of Mechanical Engineering

Course Name: Value Added Course on Rocket Engines

Evaluation of the Value-Added Courses

Answer all the Questions Each Question Carry 1 Mark

Total Marks: 20M **Min Marks: 12 Marks**

Name of the Student **H.T.No:** **Marks obtained:**

1.What is the primary purpose of a rocket engine?

A) To propel rockets into space B) To generate electricity C) To provide heating in homes D) To purify water

2. Which of the following is NOT a type of rocket engine?

A) Solid Propellant Rocket Engine B) Liquid Propellant Rocket Engine C) Gasoline Propellant Rocket Engine D) Hybrid Rocket Engine

3. Aerothermodynamics deals with the interaction between which two principles?

A) Aerodynamics and thermodynamics B) Electromagnetism and gravity C) Biology and chemistry D) Mechanics and heat transfer

4. What is the study of the movement of air and other gases called?

A) Aerothermodynamics B) Thermodynamics C) Aerodynamics D) Hydrodynamics

5. Combustion in a rocket engine primarily involves the reaction between fuel and _____.

A) Oxygen B) Nitrogen C) Hydrogen D) Carbon dioxide

6. An ideal rocket engine is one that operates with _____ losses.

A) No B) High C) Low D) Variable

7. The thrust of a rocket engine is determined by which equation?

A) Newton's second law B) Einstein's theory of relativity C) Thrust equation D) Boyle's law

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8.What are the primary parameters that affect the performance of a rocket engine?

A) Mass and velocity B) Length and width C) Temperature and pressure D) Thrust and weight

9.Rocket propellant is the fuel and oxidizer combination used to generate _____.

A) Electricity B) Heat C) Thrust D) Magnetism

10. Which of the following is NOT a type of rocket propellant?

A) Solid B) Liquid C) Gasoline D) Hybrid

11. What is the main advantage of a solid propellant rocket engine?

A) Ease of control B) High specific impulse C) Simple design D) Variable thrust

12.The regression rate in a solid propellant rocket engine refers to the rate at which the _____.

A) Fuel burns B) Engine cools C) Pressure increases D) Thrust decreases

13.Which component of a liquid propellant rocket engine is responsible for injecting propellants into the combustion chamber?

A) Injector B) Thrust chamber C) Nozzle D) Combustion chamber

14. The feed system in a liquid propellant rocket engine is responsible for _____.

A) Igniting the propellant B) Storing the propellant C) Pressurizing and delivering propellants to the combustion chamber D) Cooling the engine

15. What is the primary characteristic of a hybrid rocket engine?

A) It uses only solid propellant B) It uses only liquid propellant C) It combines features of both solid and liquid propellant rocket engines D) It uses gas propellant

16.Rocket heat transfer involves the transfer of heat from the _____ to the surroundings.

A) Fuel B) Combustion chamber C) Nozzle D) Engine

17.Which of the following is NOT a type of liquid rocket engine?

A) Bipropellant engine B) Monopropellant engine C) Tripropellant engine D) Dual propellant engine

18.Combustion of liquid propellant in a rocket engine primarily occurs in the _____.

A) Nozzle B) Injector C) Combustion chamber D) Feed system

19.The geometry of the combustion chamber in a rocket engine affects _____.

A) The color of the flame B) The efficiency of combustion C) The size of the rocket D) The weight of the propellant

20.Injectors in a liquid rocket engine are responsible for _____.

A) Storing propellant B) Pressurizing the combustion chamber C) Injecting propellants into the combustion chamber D) Cooling the engine

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Department of Mechanical Engineering

Course Name: ROCKET ENGINES

Evaluation of the Value-Added Courses

Key

Q.No	Answer	Q.No	Answer
1	A	11	C
2	C	12	A
3	A	13	A
4	C	14	C
5	A	15	C
6	A	16	B
7	C	17	C
8	C	18	C
9	C	19	B
10	C	20	C

Coordinator

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web:eswarcollegeofengg.org

Department of Mechanical Engineering

Course Name: Value Added Course on Rocket Engines

Evaluation of the Value-Added Courses

Answer all the Questions Each Question Carry 1 Mark

Total Marks: 20M **Min Marks: 12 Marks**

Name of the Student N. Gopi **H.T.No:**20JE1A0301 **Marks obtained:** 15

1.What is the primary purpose of a rocket engine? [A]

A) To propel rockets into space B) To generate electricity C) To provide heating in homes D) To purify water

2. Which of the following is NOT a type of rocket engine? [C]

A) Solid Propellant Rocket Engine B) Liquid Propellant Rocket Engine C) Gasoline Propellant Rocket Engine D) Hybrid Rocket Engine

3. Aerothermodynamics deals with the interaction between which two principles? [A]

A) Aerodynamics and thermodynamics B) Electromagnetism and gravity C) Biology and chemistry D) Mechanics and heat transfer

4. What is the study of the movement of air and other gases called? [C]

A) Aerothermodynamics B) Thermodynamics C) Aerodynamics D) Hydrodynamics

5. Combustion in a rocket engine primarily involves the reaction between fuel and _____. [C]

A) Oxygen B) Nitrogen C) Hydrogen D) Carbon dioxide

6. An ideal rocket engine is one that operates with _____ losses. [A]

A) No B) High C) Low D) Variable

7. The thrust of a rocket engine is determined by which equation? [C]

A) Newton's second law B) Einstein's theory of relativity C) Thrust equation D) Boyle's law

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NARASARAOPET

8.What are the primary parameters that affect the performance of a rocket engine? [C]

A) Mass and velocity B) Length and width C) Temperature and pressure D) Thrust and weight

9.Rocket propellant is the fuel and oxidizer combination used to generate _____. [C]

A) Electricity B) Heat C) Thrust D) Magnetism

10. Which of the following is NOT a type of rocket propellant? [C] ✓

A) Solid B) Liquid C) Gasoline D) Hybrid

11. What is the main advantage of a solid propellant rocket engine? [C] ✓

A) Ease of control B) High specific impulse C) Simple design D) Variable thrust

12.The regression rate in a solid propellant rocket engine refers to the rate at which the _____. [A] ✓

A) Fuel burns B) Engine cools C) Pressure increases D) Thrust decreases

13.Which component of a liquid propellant rocket engine is responsible for injecting propellants into the combustion chamber? [C] ✗

A) Injector B) Thrust chamber C) Nozzle D) Combustion chamber

14. The feed system in a liquid propellant rocket engine is responsible for _____. [C] ✓

A) Igniting the propellant B) Storing the propellant C) Pressurizing and delivering propellants to the combustion chamber D) Cooling the engine

15. What is the primary characteristic of a hybrid rocket engine? [C] ✓

A) It uses only solid propellant B) It uses only liquid propellant C) It combines features of both solid and liquid propellant rocket engines D) It uses gas propellant

16.Rocket heat transfer involves the transfer of heat from the _____ to the surroundings. [A] ✗

A) Fuel B) Combustion chamber C) Nozzle D) Engine

17.Which of the following is NOT a type of liquid rocket engine? [C] ✓

A) Bipropellant engine B) Monopropellant engine C) Tripropellant engine D) Dual propellant engine

18.Combustion of liquid propellant in a rocket engine primarily occurs in the _____. [C] ✓

A) Nozzle B) Injector C) Combustion chamber D) Feed system

19.The geometry of the combustion chamber in a rocket engine affects _____. [ ] ✗

A) The color of the flame B) The efficiency of combustion C) The size of the rocket D) The weight of the propellant

20.Injectors in a liquid rocket engine are responsible for _____. [B] ✗

A) Storing propellant B) Pressurizing the combustion chamber C) Injecting propellants into the combustion chamber D) Cooling the engine

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web:eswarcollegeofengg.org

Department of Mechanical Engineering

Course Name: Value Added Course on Rocket Engines

Evaluation of the Value-Added Courses

Answer all the Questions Each Question Carry 1 Mark

Total Marks: 20M **Min Marks: 12 Marks**

Name of the Student P. Prakash **H.T.No:** 20JE1A0354 **Marks obtained:** 17

1.What is the primary purpose of a rocket engine? [A]

A) To propel rockets into space B) To generate electricity C) To provide heating in homes D) To purify water

2. Which of the following is NOT a type of rocket engine? [B]

A) Solid Propellant Rocket Engine B) Liquid Propellant Rocket Engine C) Gasoline Propellant Rocket Engine D) Hybrid Rocket Engine

3. Aerothermodynamics deals with the interaction between which two principles? [A]

A) Aerodynamics and thermodynamics B) Electromagnetism and gravity C) Biology and chemistry D) Mechanics and heat transfer

4. What is the study of the movement of air and other gases called? [C]

A) Aerothermodynamics B) Thermodynamics C) Aerodynamics D) Hydrodynamics

5. Combustion in a rocket engine primarily involves the reaction between fuel and _____. [A]

A) Oxygen B) Nitrogen C) Hydrogen D) Carbon dioxide

6. An ideal rocket engine is one that operates with _____ losses. [A]

A) No B) High C) Low D) Variable

7. The thrust of a rocket engine is determined by which equation? [C]

A) Newton's second law B) Einstein's theory of relativity C) Thrust equation D) Boyle's law

8.What are the primary parameters that affect the performance of a rocket engine? [C]

A) Mass and velocity B) Length and width C) Temperature and pressure D) Thrust and weight

9.Rocket propellant is the fuel and oxidizer combination used to generate _____. [B]

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A) Electricity B) Heat C) Thrust D) Magnetism [C] ✓

10. Which of the following is NOT a type of rocket propellant?

A) Solid B) Liquid C) Gasoline D) Hybrid [C] ✓

11. What is the main advantage of a solid propellant rocket engine?

A) Ease of control B) High specific impulse C) Simple design D) Variable thrust

12.The regression rate in a solid propellant rocket engine refers to the rate at which the _____. [A] ✓

A) Fuel burns B) Engine cools C) Pressure increases D) Thrust decreases

13.Which component of a liquid propellant rocket engine is responsible for injecting propellants into the combustion chamber? [A] ✓

A) Injector B) Thrust chamber C) Nozzle D) Combustion chamber

14. The feed system in a liquid propellant rocket engine is responsible for _____. [C] ✓

A) Igniting the propellant B) Storing the propellant C) Pressurizing and delivering propellants to the combustion chamber D) Cooling the engine

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A) It uses only solid propellant B) It uses only liquid propellant C) It combines features of both solid and liquid propellant rocket engines D) It uses gas propellant

16.Rocket heat transfer involves the transfer of heat from the _____ to the surroundings. [B] ✓

A) Fuel B) Combustion chamber C) Nozzle D) Engine

17.Which of the following is NOT a type of liquid rocket engine? [C] ✓

A) Bipropellant engine B) Monopropellant engine C) Tripropellant engine D) Dual propellant engine

18.Combustion of liquid propellant in a rocket engine primarily occurs in the _____. [D] ✗

A) Nozzle B) Injector C) Combustion chamber D) Feed system

19.The geometry of the combustion chamber in a rocket engine affects _____. [B] ✓

A) The color of the flame B) The efficiency of combustion C) The size of the rocket D) The weight of the propellant

20.Injectors in a liquid rocket engine are responsible for _____. [C] ✓

A) Storing propellant B) Pressurizing the combustion chamber C) Injecting propellants into the combustion chamber D) Cooling the engine

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Department of Mechanical Engineering

Course Name: ROCKET ENGINES (24-4-2023 to 29-4-2023)

YEAR/SEM: III/II **A.Y : 2022-2023**

MARKS SHEET

SNO	HTNO	NAME OF STUDENT	MARKS
1	20JE1A0301	NALLAMEKALA GOPI	15
2	20JE1A0302	SHAIK MUTHAYAPALEM SAIDA	17
3	20JE1A0303	THOTA NAGENDRA BABU	18
4	20JE1A0304	PARASA PRAKASH	17
5	20JE1A0305	SHAIK SAIDA	18
6	21JE5A0301	AKHILPALLAPU	16
7	21JE5A0303	GODA VAJRA BABU	19
8	21JE5A0304	JAMPAKANALA BAJI	17
9	21JE5A0306	MADISETTY KESAVULU	18
10	21JE5A0308	SYED NAGUR	16
11	21JE5A0309	VITTAMSETTY LOHITH SAI	15
12	19JE1A0311	JADA VAMSI	16

COURSE COORDINATOR

HOD

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Department of ME
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Department of Mechanical Engineering

Summary of the Program

Course Name: Value Added Course on Rocket Engines.

1. This course provides Aerothermodynamics of Rocket Engines, Fundamentals of Aerodynamics.
2. This course provides Introduction to Solid Propellant Rocket Engine
3. The course emphasizes Hybrid rocket Engine, Rocket Heat transfer
4. Total 12 No of students are registered out of the 12 No. of students and 12 No of students are Qualified.

Faculty Coordinator

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