# MUZAFFARPUR INSTITUTE OF TECHNOLOGY, MUZAFFARPUR

## COURSE FILE

## OF

## STEAM POWER SYSTEM

**Faculty Name: NIBHA KUMARI**

**ASSISTANT PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING**

विज्ञान एवं प्रावैधिकी विभाग
Department of Science and Technology
Government of Bihar

# CONTENTS

# Department of Mechanical Engineering

## Vision

- To strengthen the region through imparting superior quality technical education and research; which enables the fulfillment of industrial challenge and establish itself as a Centre of Excellence in the field of Mechanical Engineering.

## Mission

- To build an academic environment of teaching and lifelong learning for students to make them competitive in context with advance technological, economical and ecological changes.
- To enable the students to enhance their technical skills and communications through research, innovation and consultancy projects.
- To share and explore the accomplishments through didactic, enlightenment, R & D programs with technical institution in India and abroad.

## Mechanical Engineering Program Educational Objectives

*After 4 year of graduation a B.TECH (ME) graduate would be able to*

- Graduates will spread and enhance their technical capability and proficiency through vital domain of economical, environmental and social concerns affiliated with the mankind and industry.

- Graduates will able to work professionally with modern methods in the area of Thermal, Mechanical System Design, Manufacturing, Measurement, Quality control and other interdisciplinary fields of concerns.

- Graduates will practice Mechanical engineering in sensible, flexible and ethical manner to benefit the society, industry and nation toward the rapidly changing global technical standards.

- Graduates will serve as ambassadors for engineering by their knowledge, creativity, imagination and innovation and set new extremes in their profession through lifelong learning.

## Mechanical Engineering Student Outcomes

*Students who complete the B.TECH degree in ME will be able to:*

1. An ability to apply the knowledge of mathematics, basic sciences and engineering concepts to solve the complex engineering problems.
2. The ability to conduct experiments and to critically analyze and interpret the experimental data to reach at substantial outcomes.
3. An ability to design systems, components, or processes to meet appropriate needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. An ability to identify, formulates, and solves the complex engineering problems.

5. An ability to function on multi-disciplinary teams that leads the multi-disciplinary projects.
6. An understanding of professional and ethical responsibility.
7. An ability to communicate effectively with written, oral, and visual means.
8. An ability to understand the impact of engineering solutions in a global, environmental, economical and societal context.
9. An ability to recognize the need to engage in life-long learning.
10. An ability to attain knowledge of contemporary issues.
11. An ability to use the techniques, skills, and modern tools necessary for Mechanical engineering practice.
12. Possess ability to estimate costs, estimate quantities and evaluate materials for design and manufacturing purposes.

**COURSE OBJECTIVES:**

To acquaint students with both steam generation and electricity production and to present some of the engineering calculations encountered in practice.

Objectives that students will meet at the end of the course:

1. To analyse different types of steam cycles and estimate efficiencies in a steam power plant.
2. Basic knowledge of Different types of Power Plants, site selection criteria of each one of
3. them.
4. Define the components of such power plants.
5. List types, principles of operations, components and applications of steam turbines, steam generators, condensers, feed water and circulating water systems.
6. Estimate different efficiencies associated with such systems.
7. Design of chimney in thermal power plants, knowledge of cooling tower operation, numerical on surface condenser design.
8. Discussing environmental and safety aspects of power plant operation.

**COURSE OUTCOMES:**

After completion of this course, the students should be able to:

1. Discuss the energy resources and energy conversion methods available for the production of electric power in India.
2. Determine the efficiency and output of a modern Rankine cycle steam power plant from given data, including superheat, reheat, regeneration, and irreversibilities
3. Calculate the heat rate, fan power consumption, flame temperature and combustion air requirements of conventional steam generators (boilers).
4. Select the heat transfer tubes needed for condensers and feed water heaters
5. Explain the blade shapes, and calculate work output of typical turbine stages.
6. Explain the major types of hydro-power and wind-power turbines and estimate power generation potential.

# Student List

| . No. | College Roll No. | AKU Reg. No. | Name |
|---|---|---|---|
| 1 | 16M08 | 16102107001 | SUMAN BHARTI KESHAV |
| 2 | 16M52 | 16102107002 | MUKUND KUMAR |
| 3 | 16M19 | 16102107003 | ALOK ARAYA |
| 4 | 16M31 | 16102107004 | VIKAS KUMAR BHARTI |
| 5 | 16M20 | 16102107005 | RAJHANS KUMAR |
| 6 | 16M69 | 16102107006 | SHASHI BHUSHAN KUMAR |
| 7 | 16M05 | 16102107007 | NAWLESH KUMAR |
| 8 | 16M03 | 16102107008 | ABHISHEK KUMAR |
| 9 | 16M07 | 16102107009 | ANUBHAV SHRIVASTAVA |
| 10 | 16M58 | 16102107010 | VISHAL KUMAR |
| 11 | 16M02 | 16102107011 | MD AKRAM ALAM |
| 12 | 16M51 | 16102107012 | SANDEEP RAHUL |
| 13 | 16M12 | 16102107013 | ABHISHEK ANAND |
| 14 | 16M64 | 16102107014 | RATAN KUMAR |
| 15 | 16M43 | 16102107015 | RAUSHAN KUMAR |
| 16 | 16M32 | 16102107016 | AVINASH KUMAR |
| 17 | 16M01 | 16102107017 | SAURAV KUMAR |
| 18 | 16M22 | 16102107018 | MITHUN KUMAR |
| 19 | 16M19 | 16102107019 | MD TASLIM |
| 20 | 16M60 | 16102107020 | KUMARI PAYAL |
| 21 | 16M24 | 16102107021 | SHASHI KUMAR |
| 22 | 16M59 | 16102107022 | VIVEK KUMAR |
| 23 | 16M34 | 16102107023 | VISHWANATH KUMAR |
| 24 | 16M17 | 16102107024 | PRINCE KUMAR |
| 25 | 16M68 | 16102107025 | SHIWANGI KUMARI |
| 26 | 16M16 | 16102107026 | KANHAIYA KUMAR |
| 27 | 16M66 | 16102107027 | AMRIT RAJ |
| 28 | 16M65 | 16102107028 | NANDAN KUMAR |
| 29 | 16M71 | 16102107029 | KRISHNA KUMAR |

| | | | |
|---|---|---|---|
| 30 | 16M25 | 16102107030 | RAHUL PRASAD |
| 31 | 16M62 | 16102107031 | SHAILENDRA KUMAR |
| 32 | 16M14 | 16102107032 | SHUBHAM |
| 33 | 16M37 | 16102107033 | PIYUSH KUMAR |
| 34 | 16M54 | 16102107034 | AMIT KUMAR |
| 35 | 16M23 | 16102107035 | SHATRUDHAN KUMAR |
| 36 | 16M18 | 16102107036 | NAVNEET DHANRAJ |
| 37 | 16M40 | 16102107037 | RUPESH KUMAR |
| 38 | 16M70 | 16102107038 | AVINASH RAJ |
| 39 | 16M38 | 16102107039 | FAIZ ANWAR |
| 40 | 16M55 | 16102107040 | PRABHAKAR KUMAR |
| 41 | 16M47 | 16102107041 | VINOD KUMAR |
| 42 | 16M36 | 16102107042 | KUMAR RAHUL |
| 43 | 16M61 | 16102107043 | VISHAL KUMAR |
| 44 | 16M44 | 16102107044 | VISHAL KUMAR |
| 45 | 16M56 | 16102107045 | LALAN KUMAR |
| 46 | 16M41 | 16102107046 | RAUSHAN KUMAR |
| 47 | 16M21 | 16102107047 | VED PRAKASH |
| 48 | 16M13 | 16102107048 | ANAND MOHAN SINGH |
| 49 | 16M35 | 16102107049 | KANHAIYA KUMAR |
| 50 | 16M53 | 16102107050 | TUSHAR VERMA |
| 51 | 16M27 | 16102107051 | VISHAL KUMAR |
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| 57 | 16M11 | 16102107057 | ASHUTOSH KUMAR |
| 58 | 16M49 | 16102107058 | NIDHI KUMARI GUPTA |
| 59 | 16M67 | 16102107059 | ASHUTOSH KUMAR JHA |
| 60 | | 16104107033 | ASHUTOSH SINHA |
| 61 | 17(LE)M01 | | CHANDAN KUMAR |
| 62 | 17(LE)M02 | | RAHUL RAY |

| | | | |
|---|---|---|---|
| 63 | 17(LE)M03 | | SUDHANSHU KUMAR SHARMA |
| 64 | 17(LE)M04 | | RAJEEV KUMAR |
| 65 | 17(LE)M05 | | SANGAM KUMAR |
| 66 | 17(LE)M06 | | KRISHNA KUMAR |
| 67 | 17(LE)M07 | | ANKIT RANJAN |
| 68 | 17(LE)M08 | | DHIRAJ KUMAR |
| 69 | 17(LE)M09 | | GUDDU KUMAR |
| 70 | 17(LE)M10 | | SUNNY KUMAR |
| 71 | 17(LE)M11 | | RAKESH RAM |
| 72 | 17(LE)M12 | | ANAND MOHAN JHA |

| | | | |
|---|---|---|---|
| **Institute / School Name :** | Muzaffarpur institute of technology, Muzaffarpur | | |
| **Program Name** | B.Tech (MECHANICAL ENGINEERING) | | |
| **Course Code** | | | |
| **Course Name** | STEAM POWER SYSTEM | | |
| **L-T-P** | 3-0-3 | **Course Credits** | 5 |
| **Course Coordinator Name** | Nibha kumari | | |

## 1. Scope and Objectives of the Course

**COURSE OBJECTIVES:**

To acquaint students with both steam generation and electricity production and to present some of the engineering calculations encountered in practice.

Objectives that students will meet at the end of the course:

9. To analyse different types of steam cycles and estimate efficiencies in a steam power plant.
10. Basic knowledge of Different types of Power Plants, site selection criteria of each one of
11. them.
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13. List types, principles of operations, components and applications of steam turbines, steam generators, condensers, feed water and circulating water systems.
14. Estimate different efficiencies associated with such systems.
15. Design of chimney in thermal power plants, knowledge of cooling tower operation, numerical on surface condenser design.
16. Discussing environmental and safety aspects of power plant operation.

**Text Books (TB)**

**TB1:** Power Plant Engineering by P.K NAG

**TB2:** Thermal Engineering by C P GUPTA & R Prasad

**Reference Books (RB)**

**RB1:**.Steam turbine theory and practices by WB Keaton

**Other readings and relevant websites**

| S.No. | **Link of Journals, Magazines, websites and Research Papers** |
|---|---|
| 1. | https://nptel.ac.in/courses/112107216/ |
| 2. | https://npti.gov.in/ |
| 3. | |
| 4. | |
| 5. | |
| 6. | |

1. **Evaluation Scheme:**

| | | |
|---|---|---|
| Component 1* | Sessional Test (ST)* | 20 |
| Component 2 | Assignment Evaluation | 10 |
| Component 3** | End Term Examination** | 70 |
| | **Total** | **100** |

## SYLLABUS

| Topics | No of lectures | Weightage |
|---|---|---|
| Analysis of steam power cycle, Reheat pressure and degree of regeneration process, heat and power generation | 3 | 8% |
| **BOILERS**-Classification, boiler mounting $ accessories, draft system, chimney height calculation, Induced and forced draft fans, Boiler energy balance. Constructional details of boiler furnace, Waterwall, Pulverized fuel burning, Different types of furnaces for burning coal, fuel oil $ gas. Circulation Theory. Feed Water Treatment | 14 | 33% |
| Steam Nozzles:- Flow through nozzles shapes and flow area, Effect of friction, Supersaturated flow, Estimation of flow area, Effect of divergence. | 5 | 12% |
| **STEAM TURBINES**:-Construction $ working of steam turbines, impulse and reaction inlet and outlet velocity diagram, work output $ efficiency. Pressure and velocity compounding, Regenerative feed heating cycle, Reheat cycle, Reheat factor, Governing of Turbine, Back pressure and pass out Turbine | 12 | 28% |
| **STEAM CONDENSER:**-Types, Cooling water requirement, Air leakage and air pump capacity, Vacuum and condenser efficiency, Steam ejector, spray pond $ cooling tower. | 6 | 15% |

| | | |
|---|---|---|
| **Instrumentation** in steam turbine plan | 2 | 4% |

**This Document is approved by:**

| Designation | Name | Signature |
|---|---|---|
| Course Coordinator | | |
| H.O.D | | |
| Principal | | |
| Date | | |

**Evaluation and Examination Blue Print:**

Internal assessment is done through quiz tests, presentations, and assignments work. Two sets of question papers are asked from each faculty and out of these two, without the knowledge of faculty, one question paper is chosen for the concerned examination. The components of evaluations along with their weightage followed by the University is given below

| | |
|---|---|
| Sessional Test | 20% |
| Internals | 10% |
| End term examination | 70% |

| | | | |
|---|---|---|---|
| **Institute / School Name :** | MIT Muzaffarpur | | |
| **Program Name** | **B.Tech Mechanical Engineering** | | |
| **Course Code** | | | |
| **Course Name** | STEAM POWER SYSTEM | | |
| **L-T-P** | 3-0-3 | **Course Credits** | 3.5 |
| **Course Coordinator Name** | NIBHA KUMARI | | |

**LECTURE PLAN**

| **Topics** | **Lecture Number** | **Date on which the Lecture was taken** |
|---|---|---|
| **Introduction & analysis of steam power cycle** | | **11/07/18** |
| Analysis of steam power cycle, | **1** | **13/07/18** |
| Reheat | **2** | **16/07/18** |
| Regeneration | **3** | **18/07/18** |
| heat and power generation | **4** | **20/07/18** |
| **Boilers** | | **23/07/18** |
| **BOILERS-**Classification, boiler | **5** | **25/07/18** |
| boiler mounting $ accessories | **6** | **27/07/18** |
| draft system, chimney height calculation | **7** | **3/08/18** |
| Induced and forced draft fans, Boiler energy balance. | **8** | **6/08/18** |
| Numerical based on above, Different types of furnaces for burning coal, fuel oil $ gas | | **8/08/18** |
| Feed Water Treatment, Waterwall | **9** | |
| Circulation Theory | **10** | |
| **Steam nozzles** | **11** | |
| Flow through nozzles | **12** | |
| shapes and flow area | **13** | |
| Effect of friction | **14** | |
| Supersaturated flow | **15** | |
| Supersaturated flow | **16** | |
| Effect of divergence | | |
| Numerical based on above | **17** | |
| Numerical based on above | **18** | |

| | | |
|---|---|---|
| **Steam turbines** | **19** | |
| Construction $ working of steam turbines, | **20** | |
| impulse and reaction inlet and outlet velocity diagram | **21** | |
| work output $ efficiency | **23** | |
| Pressure and velocity compounding | **24** | |
| Regenerative feed heating cycle | **25** | |
| Regenerative feed heating cycle | **26** | |
| Governing of Turbine | **27** | |
| Back pressure and pass out Turbine | **28** | |
| Numerical based on above | **29** | |
| **Steam condenser** | | |
| Introduction to steam condenser | **30** | |
| Types of cooling tower | **31** | |
| Air leakage and air pump capacity, | **32** | |
| Vacuum and condenser efficiency | **33** | |
| Steam ejector | **34** | |
| Types of condenser | | |
| Cooling tower | **35** | |
| Numerical based on above | **36** | |
| **Instrumentation in steam turbine plan** | **37** | |
| Instrumentation | **38** | |
| | **39** | |
| | **40** | |

**MUZAFFARPUR INSTITUTE OF TECHNOLOGY, MUZAFFARPUR**
**MECHANICAL ENGINEERING**
**B.Tech V$^{th}$ Sem**

Instruction: Answer all the questions
Total Marks: 10
Total Time: 20 min.
Name:_____
Registration No.:_____

**1. Carnot cycle is a reversible cycle.**
a) True
b) false

**2. For analytical purposes, the Rankine Cycle is assumed to be in?**
a) Unsteady flow operation
b) Turbulent flow operation
c) Steady flow operation
d) Laminar flow operation

**3. The net work done in a Rankine Cycle is the difference of?**
a) Condenser work & Boiler work
b) Boiler work & Pump work
c) Turbine Work & Pump work
d) Condenser work & Pump work

**4. Steam Rate is the reciprocal of _____**
a) Net work done
b) Heat extracted from condenser
c) Heat given to reciprocal
d) Work done by turbine

**5. Efficiency of a Rankine Cycle is also expressed as_____**
a) Capacity Ratio
b) Heat Rate
c) Heat Ratio
d) Steam Rate

**6. Which of these is sometimes neglected?**
a) Turbine work
b) Pump work
c) Condenser heat
d) Boiler heat

**7. The efficiency of all reversible heat engines operating between the same heat reservoirs is**
a) same
b) independent of the nature of working substance
c) independent of the amount of working substance
d) all of the mentioned

**8. Steam Power Plants are more popular in electric power generation because**
a) Work output of turbine is very large than work input to the pump
b) Work output of turbine is very small than work input to the pump
c) Work output of turbine is equal to work input to the pump
d) None of the mentioned.

**9. Rankine cycle comprises of**
(a) Two isentropic processes and two constant volume processes
(b) Two isentropic processes and two constant pressure processes
(c) Two isothermal processes and two constant pressure processes
(d) None of the above.

**10. In thermal power plant, turbine is placed**

a) Before boiler b) in between boiler and generator
c) after generator
d) any of the above

**MUZAFFARPUR INSTITUTE OF TECHNOLOGY, MUZAFFARPUR**

**MECHANICAL ENGINEERING**

**B.Tech V$^{th}$ Sem**

Instruction: Answer all the questions

Total Marks: 10

Total Time: 20 min.

Name:_____

Registration No.:_____

Why both reheating and regeneration is used together?

a) the effect of reheat alone on efficiency is very small

b) regeneration has a marked effect on efficiency

c) both of the mentioned

d) none of the mentioned

The thermal irreversibility should be ____ to improve the performance.

a) reduced

b) increased

c) kept constant

d) none of the mentioned

Mean temperature of heat addition is _____ due to Regeneration

a) Decreases

b) not effected

c) Increases

d) varied exponentially

Is regenerative cycle alone useful?

a) Yes

b) No

c) may be

d) depends on other factors

The following are the fire tube boilers except

Cochran

Lancashire

Locomotive

Babcock and Wilcox

Which of the following is a low pressure boiler?

Babcock and Wilcox

Velox

Lamont

Cochran

The following is an accessory of a boiler.

Pressure gauge

Safety valve

Fusible plug

Superheater

What is the function of Blow down valve of a boiler?

a) To remove sludge

b) To build sediments

c) To remove Flue gas

d) To remove ash

What is the function of superheater in the boiler?

a) Increase the temperature of steam

b) Reheat the steam

c) Superheat the feed water

d) To heat the fuel gas

The boiler works on a forced circulation is

Cochran

Lamont
Lancashire
Stirling

| Weekly Test marks of Steam Power System | | | | | |
|---|---|---|---|---|---|
| | | | | 16/07/2018 | 18-07-2023 |
| S.No | **AKU Reg. No.** | College Roll No. | Name | Marks(out of 10) | Marks(out of 10) |
| 1 | 16102107001 | 16M08 | SUMAN BHARTI KESHAV | 9 | 10 |
| 2 | 16102107002 | 16M52 | MUKUND KUMAR | AB | AB |
| 3 | 16102107003 | 16M19 | ALOK ARAYA | 9 | 7 |
| 4 | 16102107004 | 16M31 | VIKAS KUMAR BHARTI | AB | 7 |
| 5 | 16102107005 | 16M20 | RAJHANS KUMAR | 7 | 7 |
| 6 | 16102107006 | 16M69 | SHASHI BHUSHAN KUMAR | 9 | 8 |
| 7 | 16102107007 | 16M05 | NAWLESH KUMAR | 10 | 8 |
| 8 | 16102107008 | 16M03 | ABHISHEK KUMAR | 8 | 6 |
| 9 | 16102107009 | 16M07 | ANUBHAV SHRIVASTAVA | AB | AB |
| 10 | 16102107010 | 16M58 | VISHAL KUMAR | AB | AB |
| 11 | 16102107011 | 16M02 | MD AKRAM ALAM | AB | 8 |
| 12 | 16102107012 | 16M51 | SANDEEP RAHUL | 9 | AB |
| 13 | 16102107013 | 16M12 | ABHISHEK ANAND | 9 | 6 |
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| 18 | 16102107018 | 16M22 | MITHUN KUMAR | 9 | AB |
| 19 | 16102107019 | 16M19 | MD TASLIM | AB | 9 |
| 20 | 16102107020 | 16M60 | KUMARI PAYAL | 8 | 7 |
| 21 | 16102107021 | 16M24 | SHASHI KUMAR | AB | AB |
| 22 | 16102107022 | 16M59 | VIVEK KUMAR | 7 | AB |
| 23 | 16102107023 | 16M34 | VISHWANATH KUMAR | 6 | 4 |
| 24 | 16102107024 | 16M17 | PRINCE KUMAR | 7 | 5 |
| 25 | 16102107025 | 16M68 | SHIWANGI KUMARI | 9 | 10 |
| 26 | 16102107026 | 16M16 | KANHAIYA KUMAR | 8 | AB |
| 27 | 16102107027 | 16M66 | AMRIT RAJ | AB | AB |
| 28 | 16102107028 | 16M65 | NANDAN KUMAR | 9 | 9 |
| 29 | 16102107029 | 16M71 | KRISHNA KUMAR | 10 | 8 |
| 30 | 16102107030 | 16M25 | RAHUL PRASAD | 8 | 9 |
| 31 | 16102107031 | 16M62 | SHAILENDRA KUMAR | AB | AB |
| 32 | 16102107032 | 16M14 | SHUBHAM | 10 | AB |
| 33 | 16102107033 | 16M37 | PIYUSH KUMAR | 9 | AB |
| 34 | 16102107034 | 16M54 | AMIT KUMAR | AB | AB |
| 35 | 16102107035 | 16M23 | SHATRUDHAN KUMAR | AB | AB |
| 36 | 16102107036 | 16M18 | NAVNEET DHANRAJ | AB | AB |
| 37 | 16102107037 | 16M40 | RUPESH KUMAR | AB | AB |

| | | | | | |
|---|---|---|---|---|---|
| 38 | 16102107038 | 16M70 | AVINASH RAJ | 5 | AB |
| 39 | 16102107039 | 16M38 | FAIZ ANWAR | AB | AB |
| 40 | 16102107040 | 16M55 | PRABHAKAR KUMAR | AB | AB |
| 41 | 16102107041 | 16M47 | VINOD KUMAR | 8 | 7 |
| 42 | 16102107042 | 16M36 | KUMAR RAHUL | AB | 7 |
| 43 | 16102107043 | 16M61 | VISHAL KUMAR | AB | AB |
| 44 | 16102107044 | 16M44 | VISHAL KUMAR | AB | AB |
| 45 | 16102107045 | 16M56 | LALAN KUMAR | 7 | AB |
| 46 | 16102107046 | 16M41 | RAUSHAN KUMAR | AB | AB |
| 47 | 16102107047 | 16M21 | VED PRAKASH | 6 | 8 |
| 48 | 16102107048 | 16M13 | ANAND MOHAN SINGH | 7 | AB |
| 49 | 16102107049 | 16M35 | KANHAIYA KUMAR | 10 | 8 |
| 50 | 16102107050 | 16M53 | TUSHAR VERMA | AB | AB |
| 51 | 16102107051 | 16M27 | VISHAL KUMAR | AB | AB |
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| 54 | 16102107054 | 16M63 | SONU KUMAR | 7 | 8 |
| 55 | 16102107055 | 16M15 | SURENDRA KUMAR | 9 | 8 |
| 56 | 16102107056 | 16M26 | MANOHAR KUMAR | AB | AB |
| 57 | 16102107057 | 16M11 | ASHUTOSH KUMAR | 8 | 8 |
| 58 | 16102107058 | 16M49 | NIDHI KUMARI GUPTA | AB | 8 |
| 59 | 16102107059 | 16M67 | ASHUTOSH KUMAR JHA | 6 | AB |
| 60 | 16104107033 | | ASHUTOSH SINHA | AB | 7 |
| 61 | | 17(LE)M01 | CHANDAN KUMAR | 9 | 7 |
| 62 | | 17(LE)M02 | RAHUL RAY | AB | AB |
| 63 | | 17(LE)M03 | SUDHANSHU KUMAR SHARMA | 9 | 6 |
| 64 | | 17(LE)M04 | RAJEEV KUMAR | AB | AB |
| 65 | | 17(LE)M05 | SANGAM KUMAR | 8 | 8 |
| 66 | | 17(LE)M06 | KRISHNA KUMAR | 7 | AB |
| 67 | | 17(LE)M07 | ANKIT RANJAN | AB | AB |
| 68 | | 17(LE)M08 | DHIRAJ KUMAR | AB | AB |
| 69 | | 17(LE)M09 | GUDDU KUMAR | 6 | AB |
| 70 | | 17(LE)M10 | SUNNY KUMAR | AB | 7 |
| 71 | | 17(LE)M11 | RAKESH RAM | 7 | 6 |
| 72 | | 17(LE)M12 | ANAND MOHAN JHA | 10 | AB |