



10028

8E1923

Roll No. _____

Total No. of Pages: 2

8E1923

B. Tech. VIII-Sem. (Main/Back) Exam. April-2026

Mechanical Engineering

8ME5-13 Additive Manufacturing

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Define Rapid Prototyping (RP).
- Q.2 Write two advantages of Additive Manufacturing over Conventional Manufacturing.
- Q.3 What is STL file format?
- Q.4 Define Selective Laser Sintering (SLS).
- Q.5 What is Stereo Lithography (SLA)?
- Q.6 Define Rapid Tooling.
- Q.7 What is Laminated Object Manufacturing (LOM)?
- Q.8 What is Direct Rapid Manufacturing?
- Q.9 Define Reverse Engineering in Additive Manufacturing.
- Q.10 What are the applications of Additive Manufacturing in medical engineering?

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PART – B

[5×4=20]

(Analytical/Problem Solving Questions)

Attempt any five questions

- Q.1 Explain Rapid Product Development (RPD). Discuss the need and importance of Rapid Prototyping in product development.
- Q.2 Explain the Stereo Lithography (SLA) process with neat diagram. Discuss its advantages and limitations.
- Q.3 Describe the Selective Laser Sintering (SLS) process and explain the important process parameters affecting the quality of parts.
- Q.4 Explain Solid Ground Curing (SGC) process with its principle, working and applications.
- Q.5 Discuss the concept of Rapid Tooling (RT). Differentiate between Direct RT and Indirect RT.
- Q.6 Explain Powder Metallurgy based additive manufacturing technologies and their applications.
- Q.7 Discuss the Direct Digital Manufacturing (DDM) concept and its advantages in modern manufacturing.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Explain the data preparation steps in Additive Manufacturing including CAD modeling, STL conversion, slicing and machine setup.
- Q.2 Discuss various Rapid Tooling techniques such as silicon rubber molding, epoxy tooling and spray metal tooling.
- Q.3 Explain the process of Laminated Object Manufacturing (LOM). Compare it with other additive manufacturing techniques.
- Q.4 Describe the role of Reverse Engineering in Additive Manufacturing. Explain geometric data acquisition methods used in reverse engineering.
- Q.5 Explain STL file format, its structure, advantages and common errors in STL files. Also, describe methods for STL file repair.



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8E1956

Roll No. _____

Total No. of Pages: 2**8E1956****B. Tech. VIII-Sem. (Main/Back) Exam. April-2026****Open Elective-II****8MI6-60.2 Maintenance Management****Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:*

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in Form No. 205)

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Describe the functions of maintenance systems.
- Q.2 Classify the land selectivity of failure.
- Q.3 Define the term optimum level of maintenance.
- Q.4 Describe the zero memory case.
- Q.5 Discuss the term salvage value.
- Q.6 Define the term "Reliability".
- Q.7 State the components of maintenance cost.
- Q.8 What different types of maintenance organizations are in use in Indian industries?
- Q.9 Mention the maintenance functions.
- Q.10 Explain the term resource allocation.

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Define the concepts and structure of suitable organizations for maintenance systems.
- Q.2 State the types of maintenance budget.
- Q.3 What are the important factors considering maintenance planning?
- Q.4 State the benefits of reliability analysis in industries.
- Q.5 What are the functions of lubrication and give the tips on lubrication?
- Q.6 Explain the following -
 - (a) Work measurement for maintenance
 - (b) Maintenance service contract
- Q.7 Describe an effective strategy for deciding when to discard or sell low-moving spares.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem solving/Design questions)

Attempt any three questions

- Q.1 Explain the different models for various maintenance systems.
- Q.2 What are all the steps involved in preventive maintenance, why preventive maintenance is better than reactive maintenance?
- Q.3 How do insurance spares with salvage value impact the total cost of inventory management? If a company hold insurance spares with a high salvage value, how should it approach stock level calculations to optimize inventory costs?
- Q.4 Explain the following -
 - (a) Economics of overhaul
 - (b) Major plant shutdown procedures
 - (c) Replacement and reconditioning
 - (d) Computerization of maintenance activities
- Q.5 What are the causes of vibration? Discuss the vibration signature analysis for organizing the preventive maintenance program.



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8E1937

Roll No. _____

Total No. of Pages: **2****8E1937****B. Tech. VIII-Sem. (Main/Back) Exam. April-2026****Open Elective-II****8AG6-60.1 Energy Management****Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:*

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Define Energy Auditing.
- Q.2 What is the significance of the "Energy Matrix" in industries?
- Q.3 Define "Payback Period" in energy projects.
- Q.4 What are "Green Buildings"?
- Q.5 What is the "Energy Conservation Act 2001"?
- Q.6 Name two energy forecasting models.
- Q.7 Define Energy Efficiency.
- Q.8 What is the main goal of Energy Demand Management?
- Q.9 What do you understand by Energy Integration?
- Q.10 What is meant by Energy Forecasting?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 What are the different types of energy auditing tools? Explain their specific uses in detail.
- Q.2 Explain the conceptual and practical differences between energy auditing and energy forecasting.
- Q.3 What is meant by Energy Accounting? Provide a step-by-step procedure for implementing it.
- Q.4 Discuss various practical ways to implement energy conservation in rural areas.
- Q.5 Explain the concept of "Energy Security" and its components.
- Q.6 Describe the various steps involved in a Preliminary Energy Audit.
- Q.7 Describe the various energy-saving measures available for the transport sector.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Describe in detail the current pattern of energy consumption in Indian agriculture and the major constraints in production.
- Q.2 Discuss various energy-saving measures that can be implemented in modern commercial and residential buildings.
- Q.3 Explain the detailed methodology of a Comprehensive Energy Audit for a manufacturing plant.
- Q.4 Detail the "Energy Matrix" approach for a textile industry to identify energy-saving opportunities.
- Q.5 Explain the importance and procedure of "Energy Monitoring and Targeting (M&T)" in a process industry.