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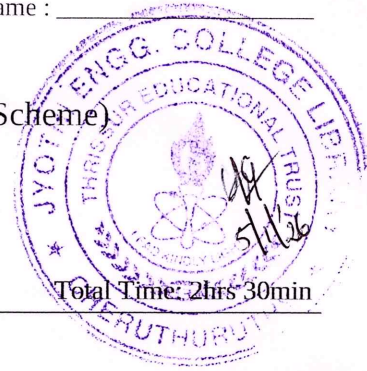
Name : \_\_\_\_\_



Jyothi Engineering College(Autonomous)

B. Tech Degree S1 (R) Examination, December 2025 (2025 Scheme)

25EST107- INTRODUCTION TO MECHANICAL  
ENGINEERING AND CIVIL  
ENGINEERING



Total Mark: 60

Total Time: 2hrs 30min

General Instructions

1. Use separate answer booklets for Part 1 and Part 2
2. No separate minimum marks are required to pass

CO MARK

**Part 1: MECHANICAL ENGINEERING (30 MARKS)**PART 1-A

Answer All Questions. Each question carries 3 marks

1. Compare Otto and Diesel cycles based on: (a) Type of heat addition process, (b) Application, (c) Compression ratio range. CO1 (3)
2. Differentiate between dry bulb temperature and wet bulb temperature. CO1 (3)
3. Differentiate between impulse and reaction turbine. Give example for each type. CO1 (3)
4. Define forging. Mention any two advantages of forged components. CO3 (3)

PART 1-B

Answer any one full question from each module. Each question carries 9 marks

**Module - 1**

5. A Carnot heat engine operates between a high-temperature reservoir at 650 K and a low-temperature reservoir at 310 K.
  1. Derive the expression for the thermal efficiency of a Carnot engine.
  2. Calculate the thermal efficiency of the engine. CO1 (9)
  3. If the engine produces 150 kJ of work per cycle, determine the amount of heat absorbed from the high-temperature reservoir.

*(Assume the engine operates under ideal reversible conditions.)***OR**

6. Explain the different strokes for a four stroke SI engine, with suitable diagrams. CO2 (9)

**Module - 2**

7. With a neat, labeled sketch, describe the construction and working of a reciprocating pump. Discuss its advantages, disadvantages, and applications. CO1 (9)

**OR**

8. Explain the sand casting process in detail. Discuss the advantages, limitations, and applications of sand casting. CO3 (9)

**PART 2: CIVIL ENGINEERING (30 Marks)**PART 2-A

Answer All Questions. Each question carries 3 marks

9. Explain Floor Area Ratio (FAR) with a suitable example. CO5 (3)

10. Write a short note on Environmental Engineering. CO4 (3)
11. Explain the classification of soil as per IS code. CO6 (3)
12. List out the tests conducted on bricks. CO6 (3)

**PART 2-B**

Answer any one full question from each module. Each question carries 9 marks

**Module - 3**

13. Describe in detail the major disciplines of Civil Engineering and their interdependence in real-world projects. CO4 (9)

**OR**

14. What are the different types of buildings as per NBC classification based on occupancy? CO4 (9)

**Module - 4**

15. List out various test for stones. Explain any 4 tests. CO6 (9)

**OR**

16. Explain different types of structural steel sections. CO6 (9)

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