



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

II B.Tech II Sem Supply End Examination, July 2022

Thermal Engineering - I

(MECH)

Time: 3 Hours.**Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.

2. In Part – A, answer all questions which carries 20 marks.

3. In Part – B, answer any one question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

PART- A**(10*2 Marks = 20 Marks)**

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|-------|---|----|-----|-----|
| 1. a) | Differentiate the SI and CI engine? | 2M | CO1 | BL1 |
| b) | Define air standard efficiency? | 2M | CO1 | BL1 |
| c) | What is meant by abnormal combustion | 2M | CO2 | BL1 |
| d) | Describe the application of carburetor | 2M | CO2 | BL2 |
| e) | How do you find the brake power in IC engine | 2M | CO3 | BL3 |
| f) | What is meant by positive displacement pump | 2M | CO3 | BL1 |
| g) | What is the importance of slip factor | 2M | CO4 | BL2 |
| h) | How do you find the polytropic efficiency of the compressor | 2M | CO4 | BL3 |
| i) | What is the work ratio of the simple gas turbine cycle | 2M | CO5 | BL1 |
| j) | What is the importance of intercooling | 2M | CO5 | BL1 |

PART- B**(10*5 Marks = 50 Marks)**

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|------|---|----|-----|-----|
| 2 a) | Comparison of 2stroke and 4 stroke engines | 5M | CO1 | BL2 |
| b) | Draw and explain the valve and port timing diagrams | 5M | CO1 | BL2 |

OR

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|---|---|-----|-----|-----|
| 3 | Explain about the fuel injection system in SI engine with neat sketch | 10M | CO1 | BL2 |
|---|---|-----|-----|-----|

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|------|--|----|-----|-----|
| 4 a) | Explain the term delay period and its importance | 5M | CO2 | BL2 |
| b) | Write short notes on anti-knock additives | 5M | CO2 | BL1 |

OR

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|---|---|-----|-----|-----|
| 5 | The mechanical efficiency of a single cylinder four stroke engine is 80%. The frictional power is estimated to be 25 kW. Calculate the indicated power and break power of the engine? | 10M | CO2 | BL3 |
|---|---|-----|-----|-----|

- 6 a) Discuss the effect of dopes and additives on performance of IC engines 5M C03 BL2
b) Discuss the performance characteristics of SI and CI engines. 5M C03 BL2
- OR**
- 7 Explain about the working of the reciprocating compressor with neat sketch? 10M C03 BL2
- 8 a) Differentiate the positive displacement type and dynamic compressor 5M C04 BL2
b) How do classify the compressors 5M C04 BL2
- OR**
- 9 An air compressor delivers air to a receiver at constant pressure of 10 bar. It takes in air at 1 bar and 15°C. The index of compression $n = 1.25$. Calculate (a) the temperature at the end of compression (b) the workdone per kg of air and the heat transferred during compression and (c) the workdone during delivery. 10M C04 BL3
- 10 a) Differentiate between open cycle gas turbine and closed cycle gas turbine 5M C05 BL2
b) Derive the expression for optimum pressure ratio for maximum work output. 5M C05 BL3
- OR**
- 11 With the help of T-S diagrams explain how intercooling, reheating and regeneration improve the performance of gas turbine cycle. 10M C05 BL

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