

Reg. No:

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations December-2021

ENGINEERING THERMODYNAMICS

(Agricultural Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

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|---|---|--|----|----|
| 1 | a | Show that heat and work is a path function and not a property of the system. | L1 | 6M |
| | b | What is quasistatic process along with its features? | L2 | 6M |

OR

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|---|---|--|----|----|
| 2 | a | Explain about thermodynamics equilibrium. | L1 | 6M |
| | b | Explain the differences between open system and closed system. | L2 | 6M |

UNIT-II

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|---|---|---|----|----|
| 3 | a | Explain reversible and irreversible process. | L1 | 6M |
| | b | State the second law of thermodynamics clearly. | L1 | 6M |

OR

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| 4 | a | During a cycle consisting of four processes, the heat transfers are as following. Q1 = +60KJ, Q2 = -40KJ, Q3= 15KJ, and Q4=-20KJ, Determine the net work done by the system. | L3 | 6M |
| | b | Explain about the heat engine in detailed manner. | L1 | 6M |

UNIT-III

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| 5 | a | State Avogadro's law. | L1 | 6M |
| | b | State the ideal gas equation clearly. | L1 | 6M |

OR

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| 6 | a | One kg of air in a closed system, initially at 5°C and occupying 0.3m ³ volumes, undergoes a constant pressure heating process to 100°C. There is no work other than <i>p</i> <i>dv</i> work. Find (i) the work done during the process, (ii) the heat transferred, and (iii) the entropy change of the gas. | L3 | 6M |
| | b | Draw P -V and T-S diagrams on Isochoric process and Isobaric process with derive the (i) work done (ii) heat transfer (iii) internal energy. | L2 | 6M |

UNIT-IV

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|---|---|--|----|----|
| 7 | a | Air in a closed stationary system expands in a reversible adiabatic process from 0.5 MPa, 15°C to 0.2 MPa. Find the final temperature, and per kg of air, the heat transferred, and the work done. | L3 | 6M |
| | b | Explain Limitations of Carnot cycle. | L2 | 6M |

OR

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|---|---|---|----|----|
| 8 | a | Explain the P-V, P-T, T-S diagrams of Pure Substances | L2 | 6M |
| | b | Derive an expression for thermal efficiency & mean effective pressure of a dual combustion cycle by drawing PV and TS diagrams. | L2 | 6M |

