

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Regular Examinations July-2021
BASIC THERMOYNAMICS
(Agricultural Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a What is quasi static process? What are its characteristics features? **L1 6M**
b Explain about Thermodynamic Equilibrium **L2 6M**

OR

- 2 a Explain thermodynamics system, surrounding and universal. Distinguish between closed, open, isolated Systems. **L2 8M**
b State the thermodynamic system control volume **L1 4M**

UNIT-II

- 3 a What are the Limitations of First laws of thermodynamics? **L1 6M**
b A system changes from state 1 to state 2 along the path 1a2 absorbs 75JK of heat and does 30 KJ of work. The system is returned from state 2 to state 1 along the path 2b1 by doing a work of 10 KJ. Find out the heat transfer along the path 2b1. **L3 6M**

OR

- 4 a Explain reversible and irreversible process. **L2 6M**
b What are the different modes in which energy is stored in a system? **L1 6M**

UNIT-III

- 5 a What is Avogadro's law? **L1 6M**
b State Internal Energy and Enthalpy of Gas. **L1 6M**

OR

- 6 a Derive an expression for heat transfer during polytrophic process **L4 6M**
b 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**

UNIT-IV

- 7 a Derive an expression for the thermal efficiency of Sterling cycle and draw P-V & T-S diagrams. **L4 6M**
b Find the change in enthalpy steam, initial pressure 15 bar and 0.95 then it will reach 25 bar and 400 temperature. By using mollier diagram. **L3 6M**

OR

- 8 a Derive an expression for the thermal efficiency and mean effective pressure of an Otto cycle by drawing PV and TS diagrams. **L4 6M**
b Find the change in enthalpy steam, initial pressure 12 bar and 200°C then it will reach 0.95 in isentropic process. **L3 6M**

UNIT-V

- 9 a State the methods of increasing the thermal efficiency of Rankine cycle. **L1 6M**
b Derive the expression for efficiency of Rankine cycle with P-V, T-S Diagrams. **L4 6M**

OR

- 10 a State the advantages and disadvantages of a Reheat cycle **L1 6M**
b A Steam power plant operates at a pressure of 15 bar, 3000C expands through a high pressure turbine. It is reheated at a pressure of 4 bars to 3000 C and expands through the low pressure turbine to a condenser pressure of 0.1 bar. Determine work done and cycle efficiency. **L3 6M**

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