Reg. No:

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

Time: 3 hours   Max. Marks: 60

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

UNIT-I

1	a	State the differences between heat and work.	L1	6M
	b	What do mean by property"? Distinguish between intensive and extensive	L1	6M

OR

2	a	State the following i) State ii) Path iii) thermodynamic cycle iv) Enthalpy	L1	8M
	b	Differentiate between the cyclic process and non-cyclic process	L2	4M

UNIT-II

3	a	The air in a system expands from a temperature of 600C to 3000C at a constant pressure of 2 bars. Calculate the heat transfer, work done and change in internal energy. The mass of the air is 0.6 Kg. Assume C_p=1.02 KJ/Kg^{o}K and C_v= 0.71 KJ/Kg^{o}K for air.	L3	6M
	b	State second law of thermodynamics	L1	6M

OR

4	a	State the concept of entropy of gas and availability and unavailability	L1	6M
	b	Explain about the heat engine, refrigeration and heat pump.	L2	6M

UNIT-III

5	a	What is the gas equation of ideal gas?	L1	6M
	b	State Dalton's law of partial pressures	L1	6M

OR

6	a	Derive an expression for work done during isothermal process.	L4	6M
	b	0.2 kg of air at pressure of 1.1 bars and 15°c is compressed isothermally to a pressure of 5.5 bars. Calculate (i) final volume (ii) heat rejected (iii) change in internal energy. Assume R= 0.292 KJ/Kg K	L3	6M

UNIT-IV

7	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.	L4	6M

OR

8	a	Derive an expression for the thermal efficiency of Carnot cycle and draw P-V & T-S diagrams	L4	6M
	b	Find the change in enthalpy steam, initial pressure 5 bar and 0.98 then it will reach 10 bar and 250 temperature.	L3	6M

UNIT-V

9   a   Explain with the help of neat diagram about Regenerative Cycle.   L2   6M

    b   State the advantages of Regenerative cycle over Rankine cycle, and explain effect of   L1   6M
        operating conditions on Rankine cycle efficiency.

OR

10 a   Describe the different operations of Rankine cycle and also derive the expression for   L1   6M
        its efficiency.

    b   In a Rankine cycle, the steam at inlet to turbine is saturated at a pressure of 30 bar   L3   6M
        and the exhaust pressure is 0.2 bar. Determine. (i) The pump work, (ii) Turbine
        work, (iii) Rankine efficiency, (iv) Condenser heat flow, (v) Dryness fraction at end
        of expression. Assume flow rate of 12kg/s.

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