O.P.Code: 20ME0303	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations February-2024

BASIC THERMODYNAMICS

(Agricultural Engineering)

Time: 3 Hours **Max. Marks: 60**

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

UNIT-I

1	a	What is a thermodynamic system? Explain different types of systems with suitable examples.	CO1	L1& L2	6M
	b	What do mean by property? Distinguish between intensive and extensive property.	CO1	L1	6M
		OR			
2	a	Compare work transfer and heat transfer with neat sketches.	CO1	L5	6M
	b	Show that work is a path function and not a property.	CO1	L1	6M

UNIT-II

3		What is Steady Flow Process? Derive Steady Flow Energy Equation(SFEE) for an open system.	CO2	L1& L3	12M
		OR			
4	a	One kg of Air is heated from 200C to 1050 C. Find the change of internal energy and change of enthalpy. Assume Cp=1.01 KJ/KgK and Cv=0.72 KJ/KgK.	CO2	L3	6M
	b	In an air motor cylinder the compressed air has an internal energy of 450 kJ/kg at the beginning of the expansion and an internal energy of 220 kJ/kg after expansion. If the work done by the air during the expansion is 120 kJ/kg, calculate the heat flow to and from the cylinder.	CO2	L4	6M

UNIT-III

5		Derive the relation for Work done, Heat Transfer and Change enthalpy of an Isochoric Process.	CO3	L3	12M
		OR			
6		A piston-cylinder arrangement contains 0.05 m3 of nitrogen at 1 bar and 280 K. The piston moves inwards and the gas is compressed isothermally and reversibly until the pressure becomes 5 bar. Determine :(i) Change in entropy. (ii) Workdone. Assume nitrogen to be a perfect gas.	CO3	L3	12M

UNIT-IV

7		Develop the expression for air standard efficiency for diesel engine.	CO4	L6	12M
		OR			
8		Build the phase equilibrium diagram for a pure substance P-V , P-T, T-S plot with relevant constant property line.	CO4	L3	12M

UNIT-V

9		Describe the different operations of Rankine cycle and also derive the expression for its efficiency .	CO5	L1	12M
		OR			
10		Explain the process of improving Rankine cycle efficiency with regeneration.	CO5	L2	12M

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