SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year I Semester Regular Examinations February-2025
THERMODYNAMICS
(Mechanical Engineering)

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

PART-A
(Answer all the Questions 10 x 2 = 20 Marks)

1	a	What do you mean by Boundary?	CO1	L1	2M
	b	Define Universe.	CO1	L1	2M
	c	Enumerate the term heat.	CO2	L5	2M
	d	State PMM-1.	CO2	L1	2M
	e	State second law of thermodynamics.	CO3	L1	2M
	f	Define the term Entropy	CO3	L1	2M
	g	What do you mean by triple point?	CO4	L1	2M
	h	What is a Mollier chart?	CO4	L1	2M
	i	Define COP.	CO5	L1	2M
	j	Explain the term psychometry in brief.	CO5	L2	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	What is meant by thermodynamic equilibrium? Explain in brief.	CO1	L1	5M
	b	Explain the concept of continuum in brief.	CO1	L2	5M

OR

3	What is quasi static process? Explain in detail.	CO1	L1	10M

UNIT-II

4	Explain Joule's experiment with neat sketch.	CO2	L5	10M

OR

5	a	The properties of a closed system change following the relation between pressure and volume as pV = 3.0 where p is in bar V is in m3. Calculate the work done when the pressure increases from 1.5 bar to 7.5 bar.	CO2	L4	5M
	b	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	L1	5M

UNIT-III

6	Develop an expression for Carnot Cycle and efficiency of cycle.	CO3	L5	10M

OR

7	A carnot engine working between 4000 C and 400 C produce 130 KJ of work. Determine i) The thermal efficiency. ii) the heat added iii) The entropy changes during the heat rejection process.	CO4	L3	10M

UNIT-IV

8	A certain gas has cp = 1.968 kJ/kg K, and cv = 1.507 kJ/kg K. Find its molecular weight and gas constant. A constant volume chamber of 0.3m3 capacity contains 2kg of this gas at 50C. Heat is transferred to the gas until the temperature is 1000C. Find the work done, heat transferred and the changes in internal energy, enthalpy and entropy.	CO4	L3	10M

OR

9	Derive the Clausius-Clapeyron equation with neat sketch.	CO4	L3	10M

UNIT-V

10	Describe a simple vapour compression cycle with the help of p-h and t-s Diagram.	CO5	L2	10M

OR

11	Describe any five psychometric processes with neat sketches.	CO6	L2	10M

*** END ***