SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations May/June-2024
THERMODYNAMICS
(Mechanical Engineering)

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

PART-A
(Answer all the Questions 5 x 2 = 10 Marks)

1	a	Explain the term cyclic process.	CO1	L2	2M
	b	Compare steady and unsteady flow process.	CO2	L2	2M
	c	Define an Ideal gas.	CO3	L1	2M
	d	What is critical state, critical pressure, and critical temperature?	CO4	L1	2M
	e	How do accessories differ from mounting?	CO5	L1	2M

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

UNIT-I

2	a	Define the following i) Enthalpy ii) Internal Energy	CO1	L1	5M
	b	What is quasi static process? Explain in detail.	CO1	L2	5M

OR

3	a	Classify the differences between heat and work transfers.	CO1	L4	5M
	b	Explain about Heat transfer.	CO1	L2	5M

UNIT-II

4		What is Steady Flow Process? Derive SFEE for any one engineering system.	CO2	L3	10M

OR

5	a	Compare heat engine and a reversed heat engine.	CO2	L5	5M
	b	A heat engine receives heat at the rate of 1500 KJ/min and gives an output of 8.2 KW. Determine i) The thermal efficiency ii) The rate of heat rejection.	CO2	L3	5M

UNIT-III

6		Develop the equation used for computing the entropy change of an Ideal gas.	CO3	L3	10M

OR

7		A fluid at 200 KPa and 300°C has a volume of 0.8 m^3 .In a frictionless process at constant volume the pressure changes to 100 KPa. Find the final temperature and the heat transfer a) the fluid is air, b) the fluid is steam.	CO3	L3	10M

UNIT-IV

8	a	Develop an expression for Carnot Cycle and efficiency of cycle	CO4	L3	5M
	b	A carnot engine working between 400° 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	5M

9 The swept volume of a diesel engine working on dual cycle is 0.0053m^3.   **CO4**   **L4**   **10M**
The maximum pressure is 65 bar. Fuel injection end at 5% of stroke. The
temperature and pressure at the stroke of compression are 80° C and 0.9
bar. Determine efficiency of air take $\gamma = 1.4$.

UNIT-V

10 Explain with neat sketch the construction and working of bibcock and   **CO5**   **L2**   **10M**
Wilcox boiler.

OR

11 Explain with neat sketches of the following boiler mountings   **CO5**   **L2**   **10M**
i) Water level Indicator   ii) pressure gauge

*** END ***