Q.P. Code: 19ME0305 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations July-2022

ENGINEERING THERMODYNAMICS

(Agricultural Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	**a**	Explain about enthalpy in detailed manner.	**L1**	**6M**
	b	Explain about internal energy clearly.	**L2**	**6M**
		OR		
2	**a**	Explain about cyclic process and non-cyclic process	**L1**	**6M**
	b	State the following	**L2**	**6M**
		i. Pressure ii. Temperature iii. Volume iv. Density		

UNIT-II

3	**a**	The air in a system expands from a temperature of 60^0C to 300^0C 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 Cp=1.02 KJ/KgK and Cv= 0.71 KJ/KgK for air.	**L2**	**6M**
	b	State the limitations of first law of thermodynamics	**L1**	**6M**
		OR		
4	**a**	A system changes from state 1 to state 2 along the path 1a2 absorbs 75 KJ of heat and does 30 KJ of work. The system is returned from state 2 to state 1 along the pa 2b1 by doing a work of 10 KJ. Find out the heat transfer along the path 2b1.	**L3**	**6M**
	b	State and explain about first law of thermodynamics	**L2**	**6M**

UNIT-III

5	**a**	2.5 kg of gas with an initial volume 1.2 m^3 is cooled at constant pressure of 799 KN/m^2. The temperature at the end of cooling is 287^0C. determine (i) the change in internal energy (ii) work done (iii) heat transfer take R= 0.32 KJ/kgk and cp=1.16 KJ/kg K	**L4**	**6M**
	b	Determine the final temperature, external work done, change in internal energy, in the case of 2 kg of gas at 20^0 c being heated at constant volume until the pressure is doubled.	**L3**	**6M**

OR

6	**a**	Derive an expression for heat transfer during polytropic process	**L2**	**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		State the followings i) Mollier Diagram ii) Dryness Fraction iii) Steam table	**L1**	**12M**

OR

8	**a**	Find the change in enthalpy steam, initial pressure 12 bar and 200^0C then it will reach 0.95 in isentropic process.	**L3**	**6M**
	b	Derive an expression for the thermal efficiency and mean effective pressure of an Otto cycle by drawing PV and TS diagrams.	**L4**	**6M**

UNIT-V

9		Steam at a pressure of 15 bars and 250oC is expanded through a turbine at first to a pressure of 4 bar. It is then reheated at constant pressure to the initial temperature of 250oC and is finally expanded to 0.1 bars. Using mollier chart, estimate the work done per kg of steam and amount of heat supplied.	**L3**	**12M**

OR

10	**a**	Explain the followings i) dryness Fraction ii) saturated water iii) latent heat iv) sensible heat.	**L2**	**6M**
	b	Write the followings i) Enthalpy of Water ii) Enthalpy of Wet steam iii) Enthalpy of Dry steam iv) Enthalpy of super-heated steam	**L1**	**6M**

*** END ***