Q.P. Code: 19ME0361 **R19**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations August-2022

THERMAL AND FLUID ENGINEERING

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	**a**	Explain important parts in thermal power plant.	**L1**	**6M**
	b	Differentiate between the Coal handling and Coal storage.	**L2**	**6M**

OR

2	**a**	Explain the factor to be considered for selection of site for hydroelectric power plant.	**L3**	**6M**
	b	What is need of Chimney in thermal power plant, and their types?	**L1**	**6M**

UNIT-II

3	**a**	Define and explain Zeroth Law of Thermodynamics.	**L2**	**6M**
	b	Derive an expression for the availability of an open system.	**L3**	**6M**

OR

4 A closed system undergoes a thermodynamic cycle consisting of four separate and distinct processes. The heat and work transferred in each process are as tabulated below. **L4** **12M**

Process	Heat Transfer in KJ/Min	Work Transfer in KJ/Min
1-2	20,000	0
2-3	-10,000	30,000
3-4	0	20,000
4-1	15,000	-25,000

Show that the data is consistent with the first law of thermodynamics. Also evaluate the network output in kW and the change in internal energy.

UNIT-III

5	**a**	Comparison between Rankine cycle and Carnot cycle.	**L4**	**6M**
	b	Explain the following terms i) Sensible and latent heat ii) Dryness fraction	**L1**	**6M**

OR

6	**a**	Draw the P-V, T-H diagram of pure substances.	**L3**	**6M**
	b	Find the change in enthalpy and entropy of steam, initial pressure 10 bar and 0.98 then it will reach 20 bar and 350 temperature.	**L2**	**6M**

UNIT-IV

7	**a**	Explain the types of fluid flows. Explain any four.	**L2**	**8M**
	b	Define the following fluid properties: Density, specific volume and specific gravity of a fluid.	**L1**	**4M**

OR

8	**a**	Explain how a U tube manometer is used to measure both positive and negative pressures.	**L3**	**6M**
	b	A U tube manometer is used to measure the pressure of oil of specific gravity 0.85 flowing in a pipe line. Its left end is connected to the pipe and the right limb is open to the atmosphere. The centre of the pipe is 100 mm below the mercury in the right limb. If the difference of mercury level in the two limbs is 160 mm. Determine the absolute pressure of the oil in the pipe.	**L4**	**6M**

UNIT-V

9	**a**	Derive Darcy Weisbach equation.	**L3**	**6M**
	b	In a pipe of diameter 350 mm and length 76M water is flowing with a velocity of 2.8m/s. Find the head loss due to friction using Darcy Weisbach equation. Assume kinematic viscosity of water is 0.012 stokes.	**L4**	**6M**

OR

10	**a**	Define and explain the terms: (i) Hydraulic gradient line and (ii) Total energy line.	**L1**	**6M**
	b	A 30cm x 15cm venturimeter is inserted in a vertical pipe carrying water, flowing in the upward direction. A differential mercury-manometer connected to the inlet and throat gives a reading of 30 cm. Find the discharge. Take C = 0.98.	**L4**	**6M**

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