R18

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations December-2021
THERMAL & FLUID ENGINEERING
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

1	a Explain the following terms ,State	2M
	b What are the Boiler mountings	2M
	c What are the assumptions of Bernoulli's Equation?	2M
	d What are needs of Water cooling in thermal power plant	2M
	e Explain Hydroelectric power	2M

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

UNIT-I

2 What the different type feed water treatments in thermal power plant and explain any one? **10M**

OR

3 a Explain the factor to be considered for selection of site for hydroelectric power plant. **5M**
b Differentiate between the boiler and condenser. **5M**

UNIT-II

4 a Derive an expression for the availability of an open system. **5M**
b What are the limitations of the First law of Thermodynamics? **5M**

OR

5 a Derive an expression for the availability of an open system. **5M**
b Establish the equivalence of Kelvin-Planck and Clausius statements. **5M**

UNIT-III

6 a Explain Limitations of Carnot cycle. **5M**
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. **5M**

OR

7 Explain the terms with neat sketch. **10M**
(i) Economizer, (ii) Air preheater, (iii) Convective super heater

UNIT-IV

8 a Explain the types of fluid flows. **4M**
b Two square flat plates of size 50 cm X 50 cm are spaced 12 mm apart and the space between the two is filled with oil of specific gravity 0.95. The lower plate isstationary and on the upper plate a force of 100 N is applied to move it with a velocity of 2.5 m/s. Assuming linear velocity distribution in the oil film determine the dynamic viscosity and kinematic viscosity of the oil. **6M**

OR

9 a What is Euler's equation of motion? How will you obtain Bernoulli's equation from it? **5M**
b A 30 cm diameter pipe conveying water, branches into two pipes of diameters 20 cm and 15 cm respectively. If the average velocity in the 30 cm diameter pipe is 2.5 m/s, find the discharge in this pipe. Also determine the velocity in 15 cm pipe if the average velocity in **5M**

20 cm diameter pipe is 2 m/s.

UNIT-V

10   **a**   What is a venturimeter? Derive an expression for the discharge through a venturimeter.   **5M**

     b   An orifice-meter with orifice diameter 15 cm is inserted in a pipe of 30 cm diameter. The   **5M**
pressure gauges fitted upstream and downstream of the orifice meter give readings of
14.715 N/cm2 and 9.81 N/cm2 respectively. Find the rate of flow of water through the
pipe in liters/s. Take C = 0.6.

OR

11   **a**   What is a orifice meter? Derive an expression for the discharge through a orifice meter.   **5M**

     b   A horizontal venturimeter with inlet and throat diameters 30 cm and 15 cm respectively is   **5M**
used to measure the flow of water. The reading of differential manometer connected to
inlet and throat is 10 cm of mercury. Determine the rate of flow. Take C = 0.98.

END