R18

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Nov/Dec 2019
THERMAL AND FLUID ENGINEERING
(Electrical & Electronics Engineering)

Time: 3 hours   Max. Marks: 60

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

1 a What are needs of Water cooling in thermal power plant?   **2M**
   b Define Cyclic process.   **2M**
   c Define Safety valve.   **2M**
   d Define and distinguish between surface tension and capillarity.   **2M**
   e What is meant by hydraulic gradient line?   **2M**

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

UNIT-I

1 **a** Draw the neat sketch of thermal power plant and explain coal storage system. **5M**
   b Explain the factor to be considered for selection of site for steam power plant. **5M**

OR

2 What is need of Chimney in thermal power plant and their types?   **5M**

UNIT-II

3 State first law of thermodynamics. Prove that internal energy is a property of the system. **5M**

OR

4 Derive an expression for the availability of an open system.   **5M**

UNIT-III

5 Explain any one water tube Boiler with neat sketch.   **5M**

OR

6 **a** The following readings were obtained during a boiler trail of 6 hours duration. Mean steam pressure = 12 bar; mass of steam generated = 40000 kg; mean dryness6fraction = 0.85; mean feed water temperature = 300c, coal used = 4000 kg. Calorific valve of coal = 33500 kj/kg. Calculate: (i) Factor of equivalent evaporation; (ii) Equivalent evaporation from and at 1000c; (iii) Efficiency of the boiler. **5M**
   b Explain the terms with neat sketch.(i) Fusible plug, (ii) feed check valve, (iii) Water level Indicator. **5M**

UNIT-IV

7 **a** Define the equation of continuity. Obtain an express for continuity equation for a one-dimensional flow. **5M**
   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 is stationary 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. **5M**

OR

8 **a** Explain the types of fluid flows.   **5M**

   b An oil film of thickness 1.5 mm is used for lubrication between a square plate of **5M**
size 0.9 m × 0.9 m and an inclined plane having an angle of inclination 200. The
weight of the square plate is 392.4 N and it slides down the plane with a uniform
velocity of 0.2 m/s. Find the dynamic viscosity of the oil.

UNIT-V

9 **a** Derive Darcy Weisbach equation.   **5M**

   b What are minor losses? Under what circumstances they are negligible. **5M**

OR

10 **a** Explain flow through nozzle and derive equation.   **5M**

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

END