**R19**

Reg. No: ☐☐☐☐☐☐☐☐☐☐☐☐

## SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
### (AUTONOMOUS)
**B.Tech I Year I Semester Supplementary Examinations December-2021**
**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 the different types of hydroelectric power stations. | L2 | 6M |
| | b | Differentiate between the boiler and condenser. | L3 | 6M |

**OR**

| | | | | |
|---|---|---|---|---|
| 2 | a | What the different type feed water treatments in thermal power plant and explain any one. | L2 | 6M |
| | b | Explain the factor to be considered for selection of site for steam power plant. | L3 | 6M |

### UNIT-II

| | | | |
|---|---|---|---|
| 3 | Explain thermodynamics system, surrounding and universal. Distinguish between closed, open, isolated systems. Illustrate with examples. | L3 | 12M |

**OR**

| | | | | |
|---|---|---|---|---|
| 4 | a | Establish the equivalence of Kelvin-Planck and Clausius statements. | L4 | 6M |
| | b | Explain the following terms  i) State    ii) Path    iii) Cyclic process | L1 | 6M |

### UNIT-III

| | | | | |
|---|---|---|---|---|
| 5 | a | Explain the various operation of a Carnot cycle. Also represent it on T-S and P-V diagrams | L2 | 6M |
| | b | Explain Limitations of Carnot cycle. | L1 | 6M |

**OR**

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|---|---|---|---|---|
| 6 | a | Derive the expression of Rankine cycle efficiency. | L3 | 6M |
| | b | A steam power plant works between 40 bar and 0.05 bar. If the steam supplied is dry saturated and the cycle of operation is Rankine, Find (i) cycle efficiency, (ii) Specific steam consumption. | L4 | 6M |

### UNIT-IV

| | | | | |
|---|---|---|---|---|
| 7 | a | Explain the terms: (i) Path line    (ii) Streak line    (iii) Stream line, and (iv) Stream tube. | L1 | 8M |
| | b | If 5 m3 of certain oil weighs 50 kN, calculate specific weight, density and specific gravity of oil. | L2 | 4M |

OR

| | | | | |
|---|---|---|---|---|
| 8 | a | What is a manometer? How are they classified? Explain with sketches of any two. | L1 | 6M |
| | b | Obtain an express for continuity equation for a one-dimensional flow. | L3 | 6M |

## UNIT-V

| | | | | |
|---|---|---|---|---|
| 9 | a | Explain the pipes in series and derive equation for total loss of head in pipe | L2 | 8M |
| | b | What are minor losses? Under what circumstances they are negligible. | L1 | 4M |

OR

| | | | | |
|---|---|---|---|---|
| 10 | a | An orifice-meter with orifice diameter 15 cm is inserted in a pipe diameter of 30 cm. The pressure gauges fitted upstream and downstream of the orifice meter give readings of 14.715 N/cm$^2$ and 9.81 N/cm$^2$ respectively. Find the rate of flow of water through the pipe in liters/s. Take C = 0.6. | L4 | 6M |
| | b | Explain about flow through nozzle. | L1 | 6M |

*** END ***