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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations July-2021

THERMODYNAMICS
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

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

- 1 a List out the types of thermodynamic systems. 2M
- b Define the term Entropy. 2M
- c What is Avogadro law? 2M
- d Write about Pure substance. 2M
- e How do accessories differ from mounting? 2M

PART-B

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

UNIT-I

- 2 Explain the different relationships with system and surroundings in detail. 10M

OR

- 3 a What do you understand by path function and point function? What are the exact and inexact differentials? 5M
- b Show that work is a path function and not a property. 5M

UNIT-II

- 4 a Define first law of thermodynamics. Justify that internal energy is a property of the system. 5M
- b Write a short note on 5M
 - i) reversibility and irreversibility
 - ii) availability and unavailability.

OR

- 5 A Reversible Heat pump is used to maintain a temperature of 0°C in a refrigerator when it rejects the heat to the surrounding at 25°C. If the heat removal rate from the refrigerator is 1440 KJ/min i) determine the C.O.P of the machine and work input is required. ii) If the required input to run the pump is developed by a reversible engine which receives heat at 380°C and reject heat to atm then determine the overall C.O.P of the system. 10M

UNIT-III

6 Prove that for an ideal gas $C_p - C_v = R$.

10M**OR**

7 a How the partial pressure in gas mixture related to mole fraction?

6M

b Explain polytropic process.

4M**UNIT-IV**

8 Derive an expression for air standard efficiency of dual combination cycle.

10M**OR**

9 a Find the saturation temperature change in specific volume and entropy during evaporation and latent heat of vaporization of steam at 1MPa 380°C.

5M

b A Carnot engine working between 400°C and 40°C produce 130 KJ of work. Determine i) The thermal efficiency. ii) the heat added iii) The entropy changes during the heat rejection process.

5M**UNIT-V**

10 Explain with neat sketch the construction and working of Babcock and Wilcox boiler.

10M**OR**

11 Explain with neat sketches of the following boiler mountings

10M

i) Fusible plug ii) Blow off cock

*****END*****