

Total No. of Questions : 08]

SEAT No. :

P598

[Total No. of Pages : 2

[5869] - 213

**S.E. (Automobile & Mechanical/Mechanical
Sandwich) ENGINEERING THERMODYNAMICS
(2019 Pattern) (Semester - III)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume suitable data, if necessary.
- 5) Use of electronic pocket calculator is allowed.

Q1) a) State various application of Entropy. [8]

b) A small metallic object of 5kg mass and at a temperature of 227°C is thrown in a tank of at temperature calculate change in entropy of the universe [9]

OR

Q2) a) Explain Helmholtz and Gibbs functions. [8]

b) Difference between unavailable and available energy. [9]

Q3) a) Write a short notes on : [9]

- i) Critical Point
- ii) Enthalpy of Steam
- iii) Triple Point

b) Determine superheated entropy, enthalpy and specific volume for a steam at 20 bar and 250°C using steam table. [9]

OR

Q4) a) Explain Rankin cycle. [9]

b) Difference between Rankin cycle and Carnot cycle. [9]

P.T.O.

- Q5) a)** Write down the advantages and disadvantages of gaseous fuel. [8]
b) Explain BOMB Calorimeter with a schematic diagram [9]

OR

- Q6) a)** Explain Calorific Value. [8]
b) A Bomb calorimeter water used to determine the calorific value of a coal sample and the following reading were recorded [9]

Mass of coal sample = 1.01 gm

Mass of water = 2.5 kg

Water equivalent of apparatus = 744 gm

Temperature of rise water = 2.59°C

Temperature correction of cooling = + 0.016°C

Determine the calorific value of sample in kJ/kg

Take c_p for water 4.186 kJ/kg K.

- Q7) a)** Classify The Boilers [9]
b) Explain Benson Boiler with a schematic diagram. [9]

OR

- Q8) a)** Explain Economizer. [9]
b) A boiler evaporates 3.6 kg of water per kg of coal is saturated steam at 10 bar. The temperature of feed water is 32°C. Find the equivalent evaporation. From and at 100°C as well as the factor of Evaporator. [9]

