

Total No. of Questions : 8]

[Total No. of Printed Pages : 2

Roll No

AU/ME-223 (CBCS)**B.E., III Semester**

Examination, December 2017

Choice Based Credit System (CBCS)**Thermodynamics***Time : Three Hours**Maximum Marks : 60*

- Note:** i) Attempt any five questions.
 ii) All questions carry equal marks.
 iii) Steam tables & Mollier charts are permitted.

- Explain following:
 - Steady flow process
 - Limitations of first law of thermodynamics
 - Reversible and irreversible process
- What is a heat pump? How does it differ from a refrigeration?
 - An inventor claims to have developed an engine that takes in 105mJ at a temperature of 400k and rejects 42mJ at a temperature of 200k and delivers 15kwh of mechanical work. Would you advise money to put this engine in the market.
- Explain formation of steam with the help T-H (Temperature-Heat) diagram.

32

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[2]

- The following observations were recorded to find the dryness fraction of steam by combined separating and throttling calorimeter. Total quantity of steam passed = 36kg, water drain from separator = 2kg, steam pressure before throttling = 12bar, Temp. at steam after throttling = 110°C, pressure of steam after throttling = 1.013 bar specific heat of steam = 2.1kJ/kg.K, Determine the dryness fraction of steam before inlet to the calorimeter.
- What is the main features of triple points?
 - Draw the phase equilibrium diagram for a pure substance on H-S plot with relevant constant property lines.
- What are limitations of Carnot cycle?
 - For a given compression ratio, the air standard Diesel cycle is less efficient than air standard Otto cycle explain.
- In air-standard Diesel cycle with compression ratio 17, the condition of air at the start of compression stroke are 1 bar and 300k. After addition of heat at constant pressure the temperature rises to 2700 °K Determine thermal efficiency of cycle and mean effective pressure.
- Explain actual and theoretical combustion process.
 - Write basic concept of third law of thermodynamics.
- Write properties of Ideal gases.
 - Define Enthalpy of reaction
 - Explain PVT surfaces

33

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