

Roll No. ....

**24046**

**B. Tech 3rd Semester (MAE)  
Examination – December, 2017**

**THERMODYNAMICS**

**Paper : ME-201-F**

***Time : Three Hours ] [ Maximum Marks : 100***

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*.

1. (a) What is an ideal gas. 2
- (b) What do you mean by Extensive properties ? 2
- (c) Define second law of thermodynamics. 2
- (d) Define source and sink 2
- (e) What is steady flow process ? 2
- (f) Explain Dryness fraction, enthalpy and entropy as a property of steam 4
- (g) Write short note on heat and work ? 2

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- (h) What is dryness fraction and how it is measured. 2
- (i) What do you mean by Joule Thomson coefficient? 2

### SECTION - A

2. (a) Define and explain the term State, Path, Quasi-static process. 10
- (b) What is enthalpy energy? How it is stored in system. 10
3. (a) Discuss the Zeroth Law of Thermodynamic and its utility. 10
- (b) Derive steady flow energy equation for throttling process. 10

### SECTION - B

4. A Carnot engine operates b/w two reservoirs at temp.  $T_1$  and  $T_3$ . The work output of the engine is 0.6 times the heat rejected. The difference in temperatures b/w the source and the sink is  $200^\circ\text{C}$ . Calculate the efficiency, source temperature and the sink temperature? 20
5. (a) Write the short note Loss of Available Energy Due to Heat Transfer through a Finite Temperature 10
- (b) What do you understand by entropy principal and show that entropy is a property of system? 10

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### SECTION - C

6. (a) Discuss the Properties of Dry, Wet and Superheated Steam. 10
- (b) Discuss the Phase and Phase Transformation process. 10
7. Write short note on (a) Avogadro's Law (b) Pure substance (c) mass and mole fraction 20

### SECTION - D

8. Explain the Maxwell Relations and Clapeyron Equation. 20
9. Explain the otto cycle and drive its thermal efficiency relation and draw the p-v and t-s diagram. 20

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