Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech (ME) (Sem.–4)

APPLIED THERMODYNAMICS-II

Subject Code : ME-208

Paper ID : [A0811]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

a. State the assumptions made for thermal efficiency of a gas turbine plant.

b. What is meant by chocking in centrifugal compressor?

c. Describe the function of a Carburettor.

d. What do you mean by ignition delay period?

e. Describe the function of impeller and diffuser in centrifugal compressor.

f. Draw Brayton cycle.

g. Explain pre-whirl.

h. Explain supercharging.

i. What is centane number?

j. Describe the volumetric efficiency of the compressor.

SECTION-B

2. Explain in brief the various methods of improving the efficiency of a gas turbine working on a simple Brayton cycle with the help of neat sketch.

3. What is surging in axial-flow compressors? What are its effects? Describe briefly.

4. State the advantages and disadvantages of open cycle gas turbine over closed cycle gas turbine.

5. Explain the fundamental difference between the Jet propulsion and Rocket propulsion.

6. Discuss the phenomena of surging in the case of axial flow compressor.

SECTION-C

7. In an air standard regenerative gas turbine cycle the pressure ratio is 5. Air enters the compressor at 1 bar, 300 K and leaves at 490 K. The maximum temperature in the cycle is 1000 K. Calculate the cycle efficiency, given that the efficiency of the regenerator and the efficiency of the turbine are each 80%. Assume for air the ratio of specific heats as 1.4. Also show the cycle on a T-S diagram.

8. Compare reciprocating and rotary air compressors.

9. Derive the expression for thrust power, propulsion energy, propulsion and thermal efficiencies for a propulsive system.