PVP 14

Code: ME4T3

II B.Tech II Semester Regular/Supplementary Examinations
April 2019

IC ENGINES AND GAS TURBINES
(MECHANICAL ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22 M

1. a) What is dissociation?
   b) Define volumetric efficiency.
   c) What are the functions of a nozzle?
   d) Name the various factors that influence the flame speed.
   e) Write the types of combustion chambers for CI engines.
   f) What are the various methods available for finding friction power of an engine?
   g) Compare LPG and Petrol as fuel for SI engines.
   h) Define isentropic efficiency of a compressor and gas turbine.
   i) Define the effectiveness of a regenerator.
   j) State the difference between jet propulsion and rocket propulsion.
   k) Classify the rockets.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Explain about heat loss factor and exhaust blow down. 8 M

   b) Explain the working principle of a simple carburettor with a neat sketch. 8 M

3. a) What is meant by abnormal combustion? Explain the phenomena of knock in SI engines. 8 M

   b) Does the flame front exist in a C.I engine? Explain. 8 M

4. a) A four cylinder engine running at 1200 rpm delivers 20KW.The average torque when one cylinder was cut is 110 Nm. Find the indicated thermal efficiency if the calorific value of the fuel is 43MJ/kg and the engine uses 360 grams of gasoline per KWhr. 8 M

   b) Give a brief account of LPG being used as an alternate fuel in SI engine. 8 M

5. a) Explain about the open cycle and closed cycle turbines with neat sketches and also draw P-V and T-S diagrams. 8 M

b) In an open cycle gas turbine plant, air enters at 1 bar 20^{O}C and compressed to 5 bar. Taking the following data, maximum temperature in the cycle = 680^{O}C, compressor efficiency = 85%, turbine efficiency = 80%, combustion efficiency = 85%. Pressure loss in combustion chamber = 0.1 bar. Take C_p = 1.02 kJ/kg ^{O}C and γ = 1.4 for air and gas. Find (i) Air circulation if power developed by the plant is 1065 kW (ii) Thermal efficiency of the cycle. Neglect the mass of fuel. 8 M

6. a) Explain about thrust augmentation methods with a neat sketch. 8 M

b) Explain liquid propellant rocket with a neat sketch. 8 M