SEM – 2-4 (RC 07-08)

F.E. (Semester – II) (Revised in 2007-08) Examination, May/June 2017
BASIC MECHANICAL ENGINEERING

Duration : 3 Hours

Max. Marks : 100

Instructions : *1) Answer **any five** questions with at least **one** question from **each** Module.*
*2) Assume **suitably** any missing **data**.*

MODULE – I

1. a) Derive the equation for the first law of thermodynamics applied to a Condenser. 5

   b) 1kg of air at 500 Kpa receives an addition of heat at constant volume so that its temperature rises from 100 °C to 600 °C. It then expands in a cylinder reversibly and adiabatically to its initial temperature. Finally it is compressed isothermally to it's original state. Represent the cycle on a PV diagram and find the network and heat interaction. 10

   c) Explain the concepts of Internal energy and enthalpy. 5

2. a) With the help of a P-V diagram, describe the various processes that constitute a Air Standard Otto Cycle. 7

   b) Explain the concept of Absolute Temperature Scale. 5

   c) Differentiate between : 8
      i) Extensive and Intensive properties
      ii) Point and Path Function.
      iii) Reversible and Non Reversible Process.
      iv) Isothermal and Adiabatic Process.

MODULE – II

3. a) Describe the working of a four stroke SI engine with neat sketches. 8

   b) Explain the different methods for IC engine cooling. 8

   c) Explain the terms : i) Latent Heat ii) Dryness Fraction 4

P.T.O.

4. a) Explain the working of Vapour Compression Refrigeration System with a neat diagram. 8

   b) Describe the lubrication system of an IC engine with a neat sketch. 6

   c) Describe the various components of a thermal power plant. 6

MODULE – III

5. a) With a neat sketch, describe the various components of an automobile. 8

   b) With a neat sketch, describe the working of universal joint. 6

   c) Describe the working principle of a single plate clutch. 6

6. a) Explain the principle of power steering and draw its constructional layout. 8

   b) With a neat sketch, explain hydraullic brake system of a car. 8

   c) Write a short note on automotive emissions and control. 4

MODULE – IV

7. a) Explain the process of arc welding with a neat sketch. 6

   b) Explain the hot chamber die casting process with a neat sketch. 8

   c) Compare between : i) Brazing and Welding ii) Die casting and sand casting. 6

8. a) Sketch the cross section of a sand mould ready for pouring and describe its principal parts. 8

   b) Describe the hydrostatic extrusion process with a neat sketch. 7

   c) Discuss the role of mechanical fasteners in metal joining process. 5