SEM 2 – 4 (RC-07-08)

F.E. (Semester – II) (RC 2007 – 08) Examination, May/June 2018
BASIC MECHANICAL ENGINEERING

Duration : 3 Hours | Total Marks : 100

Instructions : 1) *Answer **any five** questions with at least **one** question from **each** Module.*
2) ***Assume** missing data if necessary and justify.*
3) *Illustrate with neat sketches, **wherever** appropriate.*

MODULE – I

1. A) In an air standard Diesel cycle, the compression ratio is 16 and at the beginning of isentropic compression, the temperature is 20°C and the pressure is 0.6 MPa. Heat is added until the temperature at the end of the constant pressure process is 1500°C. Calculate
   i) the cut-off ratio
   ii) the heat supplied per kg of air and
   iii) the cycle efficiency (For air, $C_p = 1.005$, $C_v = 1.005$ and $R = 0.287$ kJ/ kgK). **8**

   B) With PV diagram, explain the Air-standard diesel cycle. **6**

   C) Explain reversible and non reversible process with their examples and importance in thermodynamics. **6**

2. A) What is a turbine ? Apply first law of thermodynamics to it. **6**

   B) Explain i) Second law of thermodynamics and ii) Degradation of energy. **10**

   C) Explain the concept of absolute temperature scale. **4**

MODULE – II

3. A) Differentiate between Spark Ignition and Compression Ignition engine. **8**

   B) Explain the working of domestic refrigerator. **6**

   C) Describe what you mean by Brake Power and Specific Fuel Consumption. **6**

4. A) Explain Vapour power cycle and Rankine cycle. **8**

   B) Using neat sketch, explain MPFI system. **6**

   C) Describe Refrigerants and Tonne of refrigeration **6**

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MODULE – III

5. A) Write short notes on : **15**
   i) Gear box
   ii) Automotive emissions and control
   iii) Power brake system.
   B) Classify automobiles. **5**

6. A) Compare the working of manual and hydraulic steering systems. **6**
   B) Explain the requirements of a good braking system. What are its functions ? **6**
   C) Write short notes on : **8**
   i) Universal joint
   ii) Propeller shaft.

MODULE – IV

7. A) Compare between Open Die Forging and Closed Die Forging. **8**
   B) Describe the following : **12**
   i) Hydrostatic extrusion
   ii) Bending
   iii) Adhesive bending.

8. A) Explain with sketch **10**
   i) Laser beam welding
   ii) Brazing.
   B) Explain the principle of rolling operation. **5**
   C) State the advantages and limitations of Sand Casting. **5**