SEM 2 – 4 (RC 07 – 08)

F.E. (Semester – II) (RC 2007 – 08) Examination,
November/December 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) What is a boiler ? Apply first law of thermodynamics to it. **6**

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

   C) An engine working on the Otto cycle is supplied with air at 0.4 MPa, 45°C. The compression ratio is 8. Heat supplied is 2500 kJ/kg. Calculate the maximum pressure and temperature of the cycle and the cycle efficiency. (For air, C_p = 1.005, C_v = 1.005 and R = 0.287 kJ/kgK). **8**

2. A) Explain Isothermal and Adiabatic process. Also give expressions related to heat and work transfer. **8**

   B) What do you mean by internal energy and enthalpy ? **6**

   C) What are constant volume and constant pressure processes ? **6**

MODULE – II

3. A) Using neat sketch, explain MPFI system. **6**

   B) Using schematic diagram, explain Refrigeration cycle. **6**

   C) Differentiate between two stroke and four-stroke engine. **8**

4. A) Describe with sketch cooling and lubrication system in Internal Combustion engines. **6**

   B) Using schematic diagram, explain Thermal Power Plant. **8**

   C) Describe latent heat and dryness fraction in steam engineering. **6**

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MODULE – III

5. A) With a neat sketch, explain the construction and working of a constant mesh gear box. 10

   B) What is a Universal Joint ? What are its applications ? 4

   C) Show the layout of an power brake system and explain its working. 6

6. A) Explain the construction and working of a single plate clutch, with a sketch. 10

   B) Show the layout of an air brake system and explain its working. 6

   C) What is a Propeller shaft ? What are its applications ? 4

MODULE – IV

7. A) Describe the various pattern in casting. 5

   B) Explain in brief : 15
   i) Adhesive Bonding.
   ii) Mechanical fastening.
   iii) Stretch forming.

8. A) Describe the relative motion between work piece and machine tool for the following operations : 16
   i) Turning ii) Drilling
   iii) Tapping iv) Grinding.

   B) With a neat sketch, explain Arc Welding. 4
