

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

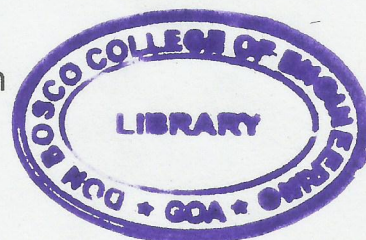
- Instructions :**
- 1) Answer **any five** questions with at least **one** question from **each** Module.
 - 2) **Assume** missing data if necessary and justify.
 - 3) Illustrate with neat sketches, **wherever** appropriate.

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



P.T.O.



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

