



SEM 2 – 4 (RC 07-08)

F.E. (Semester – II) (Revised Course 2007-08)

Examination, Nov./Dec. 2012

BASIC MECHANICAL ENGINEERING

Duration : 3 Hours

Total Marks : 100

Instructions : 1) Answer **five** questions, selecting **one** from **each** Module.
2) Illustrate your answers with **neat** sketches, **if required**.

MODULE – I

1. a) Explain the concepts of internal energy and enthalpy. 6
b) Plot the following processes on a P-V diagram. 4
 - i) Constant volume
 - ii) Constant pressure
 - iii) Isothermal
 - iv) Adiabatic.
- c) Derive the expression for the first law of thermodynamics applied to condenser. 5
d) What is the difference between otto and diesel cycle ? 5
2. a) Describe the ideal gas temperature scale. 5
b) State and explain the zeroth law of thermodynamics. 5
c) Derive the expression for the first law of thermodynamics applied to a boiler. 5
d) With the help of a P-V diagram, describe the various processes that constitute the air standard diesel cycle. 5

MODULE – II

3. a) With the help of a neat sketch, describe the working of fuel system of an Internal Combustion Engine. 6
b) Describe the working of a thermal power plant, using schematic diagram. 6
c) Write a short note on vapour compression refrigeration system. 6
d) Define Ton of refrigeration. 2



- | | |
|--|----|
| 4. a) Describe the multi-point fuel injection system with a neat sketch. | 6 |
| b) Compare spark ignition with compression ignition engines. | 10 |
| c) Explain the terms : | 4 |
| i) Latent heat | |
| ii) Dryness fraction. | |

MODULE – III

- | | |
|---|---|
| 5. a) With a neat sketch, explain hydraulic brake system of a car. | 8 |
| b) State the functions of a clutch. With a neat sketch, explain the working of a single plate clutch. | 8 |
| c) Write a short note on power steering system. | 4 |
| 6. a) Draw the layout of complete transmission system for front engine rear drive vehicle. | 6 |
| b) Write short notes on the following : | |
| i) Constant velocity universal joint | |
| ii) Automotive emissions and control. | 8 |
| c) With a neat sketch, explain the construction and working of differential. | 6 |

MODULE – IV

- | | |
|---|---|
| 7. a) Explain the hot chamber die casting process. | 5 |
| b) Compare between : | |
| i) Brazing and Welding | |
| ii) Die casting and sand casting. | 5 |
| c) Explain any three operations which can be carried out on Lathe. | 5 |
| d) Write a short note on laser beam welding. | 5 |
| 8. a) Write short notes on the following : | 8 |
| i) Adhesive bonding | |
| ii) Impact extrusion. | |
| b) What are the characteristics of forged components ? | 4 |
| c) Explain sheet metal spinning process. | 4 |
| d) Discuss the role of mechanical fasteners in metal joining process. | 4 |