

Full Marks: 70

Time: 3 hrs

Use SINGLE answer script covering both the groups.

Answer SIX questions, taking THREE from each group.

All questions carry equal marks.

GROUP A

1. a) What are the main advantages of four wheel drive used in military jeeps? Describe with a neat sketch the transfer of power from the engine to the wheel in case of four wheel drive.
b) What do you understand by the term “steering ratio”? Explain in brief the working of an oil assisted power steering system used in vehicles.
2. a) Explain with a neat sketch the working principle of Multipoint fuel injection (MPFI) engines. Also, state the major advantage of MPFI systems over carburetors.
b) What are the different subsystems of Multipoint Fuel Injection (MPFI) Engine? Explain the function of the Electronic spark timing and control in MPFI engines
3. a) What are the major functions of centrifugal and vacuum advance mechanism used in internal combustion engine? Describe with a neat sketch the working of transistor assisted ignition system.
b) What are the drawbacks of a conventional ignition system? Describe with a neat sketch the working principle of Capacitor Discharge Ignition (CDI) system with its applications.
4. a) Describe in brief the advantages of overhead valve combustion chamber used in SI engines over side valve chambers.
b) Explain the working of M Combustion chamber in connection with CI engines with a neat sketch. Also, state its major advantages.

GROUP B

5. a) What are the major limitations of a mist lubrication system used in two stroke engines?
b) With a neat schematic diagram, describe the operation of a dry sump lubrication system.

6. a) State the advantages and limitations of forced circulation system over Thermo-siphon system with respect to engine cooling.

b) What are the limitations of overcooling an engine? Describe with a neat sketch the working of cooling system of a modern day car equipped with thermostatic regulator.

7. a) What are the main limitations of air injection system used in CI engines? Describe with a sketch the working of Common Rail Injection system used in CI engines.

b) What is the function of an injection pump in a CI engine? Explain with a neat sketch the working of Bosch fuel injection pump.

8. Write short notes on the following: (any three)

a) Viscosity index of lubricating oil b) Advantages and limitations of engine water cooling

c) Lambda sensor used in MPFI engine. d) Advantages of rear engine rear wheel drive.
