MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL
Paper Code : PE-ME701A   Automobile Engineering

Time Allotted : 3 Hours

Full Marks :70

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer any ten of the following :   [1 x 10 = 10]

    (I)   The crankshaft of a typical inline four cylinder engine has___balance weights.

    (II) What is the advantage of fuel injection system in SI engine?

    (III) The acid used in automobile battery is

    (IV) The rolling resistance is because of the friction between

    (V)   The device for smoothening out the power impulses from the engine is called

    (VI) What is the main purpose of an engine's air cleaner?

    (VII) The cam shaft in an engine is always mounted

    (VIII) The drive-shafts are connected to the differential and wheel hubs through universal joints because the universal joints

    (IX) The composition of the electrolyte in a fully charged battery is that

    (X)   What is the main function of a master cylinder?

    (XI) The oil pump is driven by the

    (XII) The valve overlap in four stroke petrol engines is approximately at

Group-B (Short Answer Type Question)
Answer any three of the following   [5 x 3 = 15]

2. Describe the working of a two stroke cycle engine with neat sketch.   [5]

3. What is the ignition advance? Which factor affects its variation? Describe any one mechanism of ignition   [5]
   advance.

4. Explain semi floating type rear axle with neat sketch.   [5]

5. Describe battery ignition system with diagram. What are the difference between battery ignition and magneto   [5]
   ignition system?

6. What is the function of axle? Describe the stub axle with neat sketch.   [5]

Group-C (Long Answer Type Question)
Answer any three of the following   [15 x 3 = 45]

7. (a) What is carburation? Explain the working principle of simple carburetor.   [5]

   (b) With suitable sketch explain the MPFI system.   [6]

   (c) What are the main objects of fuel pump and fuel injector for Diesel engine?   [4]

8. (a) With neat sketch explain the principle and construction of alternator.   [8]

   (b) Explain the working principle of maintenance free battery. What are the advantages of maintenance free   [7]
   batteries?

9. (a) Describe the merits and demerits of two stroke engines compared to four stroke engines.   [7]

   (b) Discuss in detail the relative merits of Ackerman steering mechanism and Davis steering mechanism.   [8]
   Which one is used in automobile and why?

10. (a) With neat sketch explain the starting system of an automobile.   [5]

    (b) What are the requirements of starter motor of an automobile?   [4]

    (c) What are the different types of starter motor used in automobile?   [6]

11. (a) With neat sketch explain the working principle of hydraulic power steering.   [7]

(b) The track arm of a Davis steering gear is at a distance of 192 mm from the front main axle whereas the difference between their lengths is 96 mm. If the distance between steering pivots of the main axle is 1.4 m, determine the length of the chassis between the front and rear wheels. Also, find the inclination of the track arms to the longitudinal axis of the vehicle.

[8]

*** END OF PAPER ***