

CBCS SCHEME

18ME824

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Eighth Semester B.E. Degree Examination, Dec.2023/Jan.2024

Automobile Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Differentiate between SI and CI engines. (04 Marks)
- b. State various considerations affecting combustion chamber design and discuss the same in detail. (08 Marks)
- c. Mention the types of valve actuating mechanisms. Briefly explain overhead poppet valve mechanism. (08 Marks)

OR

- 2 a. Explain with sketch, the construction and working of radiator. (04 Marks)
- b. What is the necessity of engine lubrication? Briefly explain splash lubrication system. (08 Marks)
- c. Discuss the pump circulation cooling system and compare the same with the thermo siphon system. (08 Marks)

Module-2

- 3 a. Explain the construction of fluid flywheel. State its advantages and disadvantages. (12 Marks)
- b. Explain the working principle of friction clutches. (08 Marks)

OR

- 4 a. Discuss the classification of brakes from different considerations. Explain clearly the requirements of automobile brakes. (08 Marks)
- b. With a neat sketch, explain the working of hydraulic brakes. (08 Marks)
- c. The disc brakes at the front of a car have pistons of 1500 mm^2 cross-sectional area each, whereas the drum brakes at each of the rear wheels have pistons of 300 mm^2 cross sectional area. The master cylinder has piston of 500 mm^2 area. Determine:
 - (i) The ratio in which the braking force is divided between the front and the rear axles.
 - (ii) Total force magnification if the break pedal has a leverage of 5. (04 Marks)

Module-3

- 5 a. Define: (i) Camber (ii) Castor (iii) Toe-in (06 Marks)
- b. What is a steering gear? Mention the different types of steering gear box. (06 Marks)
- c. Briefly explain the air suspension system. Write the advantages they posses over conventional metal springs. (08 Marks)

OR

- 6 a. Compare battery ignition and magneto ignition system. (06 Marks)
- b. With a neat sketch, explain the principle of distributor type electronic ignition. (06 Marks)
- c. Describe a battery ignition system with the help of a neat sketch. (08 Marks)

Module-4

- 7 a. Write the advantages and limitations of turbocharging. (04 Marks)
b. What is supercharging? Write the objectives and effects of supercharging. (08 Marks)
c. Briefly explain centrifugal type of vane type of superchargers. (08 Marks)

OR

- 8 a. With the help of a neat sketch, explain the working principle of simple carburetor. (08 Marks)
b. Briefly describe the throttle body injection type MPFI system. (04 Marks)
c. With a neat sketch, explain electronic injection system. (08 Marks)

Module-5

- 9 a. Briefly explain the mechanism of photochemical smog formation. (06 Marks)
b. Write notes on:
(i) Thermal reactor package
(ii) Catalytic converter package (06 Marks)
c. Describe the EGR device for the control of oxides of Nitrogen. (08 Marks)

OR

- 10 a. Describe with sketches the following methods of petrol exhaust emission control:
(i) After-burner
(ii) Exhaust manifold reactor
(iii) Catalytic converter system (10 Marks)
b. Write note on:
(i) Motor vehicle act
(ii) Euro and Bharath stage norms (10 Marks)
