

# CBCS SCHEME

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18ME752

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

## Automotive Engineering

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. What are the basic components of an automobile? Briefly explain them. (08 Marks)  
b. Why cooling is necessary? What is the effect of over cooling and under cooling? (05 Marks)  
c. What are the basic requirements of S.I. engine combustion chamber? How these requirements can be achieved? (07 Marks)

OR

- 2 a. Draw the valve timing diagram for 4 stroke S.I. engine and explain. (06 Marks)  
b. Sketch and explain dry sump lubrication system. (07 Marks)  
c. With a neat sketch explain the construction and purpose of dry and wet liners. (07 Marks)

### Module-2

- 3 a. What is clutch? What are the requirements of clutch? (05 Marks)  
b. With a neat sketch, explain the construction and working of hydraulic braking system. (08 Marks)  
c. Explain the working of a over drive operation with a neat sketch. (07 Marks)

OR

- 4 a. What is a ABS? Explain the purpose and operation of ABS. (05 Marks)  
b. Write a short note on propeller shaft. (05 Marks)  
c. A passenger car with all when brakes weighing 1300 N makes an emergency stop at 96 km/hr. The rolling and air resistance at 96 km/hr is 820 N/Ton. The coefficient of adhesion is 0.5. Calculate:  
(i) The retarding force if the brakes are applied at locking point.  
(ii) Heat flow/sec at each wheel at the beginning of braking.  
Assume that the distribution of braking force is equal on each wheel. (10 Marks)

### Module-3

- 5 a. Define the following and explain their effect on steering:  
(i) Camber  
(ii) King pin angle or steering axis inclination  
(iii) Included angle and scrub radius  
(iv) Castor  
(v) Toe in and toe out (10 Marks)  
b. What is suspension system? What are the objectives of suspension system? (04 Marks)  
c. Write the differences between battery ignition system and magneto ignition system. (06 Marks)

OR

- 6 a. With a neat sketch, explain the working of battery ignition system. (08 Marks)  
b. Sketch and explain the working of electronic ignition system. (07 Marks)  
c. Explain the working of air suspension system with a neat sketch. (05 Marks)

**Module-4**

- 7 a. Explain the different methods of supercharging. (08 Marks)  
b. Distinguish between supercharging and turbocharging. (07 Marks)  
c. Write short notes on octane and cetane number. (05 Marks)

OR

- 8 a. With a neat sketch explain the working of turbocharger. (07 Marks)  
b. What are the air fuel mixture requirements for SI engine? (05 Marks)  
c. Sketch and explain Zenith carburetor. (08 Marks)

**Module-5**

- 9 a. Write a note on automotive emission control system. (05 Marks)  
b. With a neat sketch, explain the working of positive crank case ventilation system. (07 Marks)  
c. Sketch and explain the working of Exhaust Gas Recirculation (EGR) system. (08 Marks)

OR

- 10 Write short note on the following:  
a. Catalytic converter (07 Marks)  
b. Emission standards (06 Marks)  
c. Evaporative Control System (ECS) for fuel injected engines (07 Marks)

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