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Question Paper Code : 10986

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

Fifth/Sixth/Seventh/Eighth Semester

Mechanical Engineering

CME380 — AUTOMOBILE ENGINEERING

(Common to: Mechanical and Automation Engineering/
Mechatronics Engineering/Robotics and Automation)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is variable valve timing?
2. Differentiate between chassis and frame in automobile construction.
3. What is the role of a three-way catalytic converter in emission control?
4. What is the purpose of BS standards?
5. Differentiate between Hotchkiss Drive and Torque Tube Drive.
6. State the role of a fluid flywheel in power transmission.
7. What is Antilock Braking System?
8. List the types of Front Axle in automobiles.
9. What is the main advantage of using Hydrogen as a fuel in automobiles?
10. What are the key differences between electric vehicles and hybrid vehicles?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the various types of heavy vehicle layouts with its characteristic features, benefits and drawbacks.

Or

- (b) Discuss the influence of aerodynamic forces and moments on vehicle performance. Explain how drag, lift, and side forces impact fuel efficiency.

12. (a) Explain their working principles of Transistorized Coil Ignition and Capacitive Discharge Ignition systems with neat sketch.

Or

- (b) Describe the three-way catalytic converter system for emission control. Explain how it reduces NO_x, CO, and HC emissions.

13. (a) Describe the construction and working of the sliding mesh gearbox with schematic sketch.

Or

- (b) Explain the function, characteristic features and construction of a propeller shaft, including the roles of slip joints and universal joints.

14. (a) Explain the different types of steering gearboxes and their applications. Discuss the advantages and disadvantages of each type.

Or

- (b) Explain the construction and working principle of the Traction Control system with neat sketch.

15. (a) Explain the engine modifications required for using bio-diesel in conventional IC engines. Discuss how these modifications impact engine performance and emissions.

Or

- (b) Explain the working of a typical electric vehicle. Illustrate the powertrain schematic and analyze the function, features, and operational requirements of each key component.

PART C — (1 × 15 = 15 marks)

16. (a) Explain the construction and working principle of a Common rail direct injection system with detailed schematic sketch. Discuss its advantages over the mechanical injection system. Analyze its operational difference for different operating speeds.

Or

- (b) Explain the various types of suspension systems used in automobiles, including passive, semi-active, and active types. Compare their working principles, key components, and evaluate their performance and durability characteristics under different driving conditions.