Reg. No. : | | | | | | | | | | | | |

**Question Paper Code : R80979**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2025.

Fifth/Sixth/Seventh/Eighth Semester

Mechanical Engineering

CME 380 – 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. List any four characteristics of a good chassis.
2. What are the advantages and limitations of using VVT in internal combustion engines?
3. State any two advantages of a common rail injection system.
4. What are emission norms?
5. What is the purpose of a synchronizer in a gearbox?
6. Where is a slip joint commonly used in a vehicle?
7. What is the effect of excessive toe-out on tire wear?
8. What is the purpose of a traction control system (TCS) in a vehicle?
9. What is the full form of CNG and LNG?
10. What is the main advantage of using alternate fuels over conventional fuels?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the construction of various frames used in automobiles with neat sketch, also mention the advantages and disadvantages of each one.

Or

(b) Describe major components of an automobile and explain the functions of each components with suitable neat sketches.

12. (a) With suitable sketches explain mono point and multi point fuel injection systems and bring out the comparative features.

Or

(b) Explain the construction and working of a turbocharger with a neat sketch. Mention advantages and disadvantages of the same.

13. (a) What are the features of a good quality clutch? Explain the working of multi plate clutch with a neat sketch.

Or

(b) Explain the necessity of a differential in an automobile. Discuss in detail the construction and operation of the differential with suitable neat sketches.

14. (a) Explain the front axle of a car and show how it is connected with the stub axle with the neat sketch.

Or

(b) Draw a simple diagram to show the layout of a hydraulically operated four wheel brake system and explain its working in detail.

15. (a) Discuss in detail about different alternate fuels for automotive engines with respect to the following aspects (i) Emission (ii) Cost (iii) Reliability (iv) Availability (v) Engine modifications needed.

Or

(b) Explain in detail about different types of Hybrid vehicle constructions with neat sketches.

PART C — (1 × 15 = 15 marks)

16. (a) Sketch and explain a Hydraulic power steering gear box and compare it with ordinary steering system.

Or

(b) Describe clearly the constructional details and operation of various rear axle drives with suitable neat sketches.