



Eighth Semester B.E. Degree Examination, June/July 2025
Automotive Electronics and Hybrid Vehicles

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain spark plug configuration spark pulse generation and ignition timing with relevant diagram. (10 Marks)
- b. Explain the effect of air fuel ratio in the engine performance. (10 Marks)

OR

- 2 a. What are the drive train? With schematic explain the planetary gear system. (10 Marks)
- b. Explain with diagram starting and braking of the four stroke engine. (10 Marks)

Module-2

- 3 a. Explain the working of Throttle Position Sensor (TPS) and Throttle angle sensor with relevant diagram. (10 Marks)
- b. Explain air flow rate sensor with neat diagram. (10 Marks)

OR

- 4 a. What is Hall effect? Explain with a neat diagram position sensor using principle of hall effect. Compare it with magnetic reluctance sensor. (10 Marks)
- b. With relevant diagram, explain Engine Crank Shaft Angular Position (CKP) Sensors. (10 Marks)

Module-3

- 5 a. Explain in details
 - i) Fuel Quantity Measurement
 - ii) Oil Pressure Measurement.
 (10 Marks)
- b. Explain the details :
 - i) Occupant Protection System
 - ii) Remote Keyless Entry
 (10 Marks)

OR

- 6 a. Draw and Distinguish Vehicle Speed Measurement. (10 Marks)
- b. Explain :
 - i) Body and Chasis Electrical System
 - ii) Global Positioning System
 (10 Marks)

Module-4

- 7 a. i) Explain power brake system working and types. (10 Marks)
ii) Show and explain Antilock Lock Braking (ABS) System.
- b. i) Explain Electronic Steering Control and Power Steering.
ii) Explain Traction Control System and Electronically Controlled Suspension. (10 Marks)

OR

- 8 Explain automotive diagnostics system with type and diagram also write a notes on On-Board-Diagnostics and Off-Board-Diagnostics. (20 Marks)

Module-5

- 9 i) Draw and explain the general layout of an EV and discuss the transmission characteristics. (10 Marks)
ii) Explain the Electric Vehicle Components. (10 Marks)

OR

- 10 i) Explain different architectures of hybrid electric drive train and explain the series hybrid electric drive train. (10 Marks)
ii) What are the different modes of charging batteries? Compare them in details. (10 Marks)
