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Eighth Semester B.Tech. Degree Examination, June/July 2024 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 the four stroke cycle used in internal combustion engines with neat diagrams. (10 Marks)
- b. Describe the functions of a spark plug and how spark pulses are generated. Draw neat sketch. (10 Marks)

OR

- 2 a. Discuss the functions of the transmission and brakes in a vehicle. (05 Marks)
- b. Explain disc brakes and drum brakes with the help of neat sketches. (08 Marks)
- c. Illustrate the components and operation of the air/fuel system in an internal combustion engine. (07 Marks)

Module-2

- 3 a. What is the function of an Oxygen sensor in an automotive engine, and how does it operate? (08 Marks)
- b. Explain the role of throttle position sensors in an automotive engine. (05 Marks)
- c. Describe the function and operation of a Manifold Absolute Pressure (MAP) sensor. (07 Marks)

OR

- 4 a. What role does a fuel injector play in the engine, and how does it operate? Draw a sketch. (10 Marks)
- b. Explain the purpose of the Exhaust Gas Recirculation (EGR) system in an automotive engine. (10 Marks)

Module-3

- 5 a. Why is sampling, measurement, and signal conversion important in automotive instrumentation. (10 Marks)
- b. Explain why is protection essential in automotive electrical systems, and what measures are taken to ensure it? (10 Marks)

OR

- 6 a. Describe the role of electrical systems in the body and chassis of a vehicle. (10 Marks)
- b. Explain the functionality of Remote Keyless Entry (RKE) system in modern vehicles. (10 Marks)

Module-4

- 7 a. Explain the function and benefits of an Antilock Brake System (ABS) in a vehicle. (06 Marks)
- b. What is Power Steering? And how does it enhance vehicle maneuverability? (06 Marks)
- c. What is On Board Diagnostics (OBD), and how does it aid in vehicle diagnostics? (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Describe the function and benefits of collision avoidance radar warning systems in vehicles. (10 Marks)
b. What is an Advanced Driver Information system (ADIS) and how does it enhance the driving experience? (10 Marks)

Module-5

- 9 a. Explain the concept of a Hybrid Electric Vehicle (HEV) its operating principles. (10 Marks)
b. Compare and Contrast Electric Vehicles (EVs) and Conventional Electric Vehicles (CEVs) in terms of their propulsion system and environmental impact. (10 Marks)

OR

- 10 a. Describe the architecture of Plug – in – Hybrid Electric Vehicles (PHEVs) and their advantages. (10 Marks)
b. What is vehicle simulation? And how it is used in the design and development of alternative vehicles? (10 Marks)

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