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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Regular Examination June 2023 (2019 Scheme)

Course Code: MRT402

Course Name: AUTOTRONICS

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1 Define components of IC engines (3)
a. Connecting Rod.
b. Crankshaft.
c. Camshaft.

2 List the advantages of electronic ignition system. (3)

3 Explain the terms. (3)
a. Lambda sensor.
b. Oil pressure sensor.
c. Manifold absolute pressure (MAP).

4 What is detonation? (3)

5 Explain Open loop and closed loop control system in the bases of Digital engine control system. (3)

6 Discuss some of the emerging technologies and trends in automotive electronic systems? And how are they expected to shape the future of the automotive industry? (3)

7 Write about the types of Hybrid Vehicles. (3)

8 Explain adaptive cruise control system with a neat sketch. (3)

9 Draw and explain basic structure of vehicle intelligence. (3)

10 What are the applications of object detection in autonomous vehicles? (3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11 a) What do you mean by Ignition in an IC engine? What are the components of an ignition system and explain each of them? (8)

b) Write the advantages and disadvantages of battery ignition system. (6)

OR

12 a) Explain the different strokes for a four stroke SI engine, with suitable diagrams. (8)

b) Differentiate between 2 stoke and 4 stoke engines. (6)

Module II

13 a) Discuss about Emission Control systems in an automobile. (7)

b) Explain the working of carburettor fuel system. (7)

OR

14 a) Explain the working of Common Rail Direct Injection system (CRDI) with, layout. (9)

b) Explain the Three-way Catalyst (TWC) Convertor and its use in automobile. (5)

Module III

15 a) Describe some of the common methods used for engine cooling and warm-up control, and how do they impact engine performance and fuel efficiency? (7)

b) Describe some common security and warning systems used in modern automobiles and how do they work to prevent accidents? (7)

OR

16 a) Discuss the purpose of On-board diagnostics (OBD) in modern vehicles, and how does it work to diagnose and monitor engine and emission systems? (8)

b) Describe some of the key parameters that need to be controlled in both Spark Ignition (SI) and Compression Ignition (CI) engines for optimal performance, efficiency, and emissions? (6)

Module IV

17 a) Explain the working of electronic power steering. (7)

b) With the help of neat sketches explain the working of electronic clutches. (7)

OR

18 a) Explain why Antilock Braking System (ABS) is needed? Also draw a schematic diagram of which depict the configuration of ABS. (10)

b) Explain traction control system in an automobile. (4)

Module V

19 a) Explain the types of collision warning and avoidance system and benefits. (8)

b) List the application of mobile robot vision in vehicle information system. (6)

OR

20 a) Explain the components of a dynamic vision system in an autonomous vehicle. (8)

b) Draw and explain the architecture for dynamic vision system. (6)

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