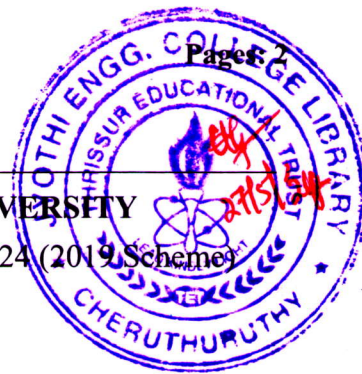Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Eighth Semester B.Tech Degree (R, S) Examination May 2024 (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) Fuel Injectors.
   b) Engine Valves.
   c) Gudgeon Pin.

2. What are the factors governing combustion in IC engines? (3)

3. Explain the terms. (3)
   a) Throttle Position Sensor.
   b) Mass Air Flow.
   c) Coolant Temperature Sensors.

4. Explain about the working of oil pressure sensor. (3)

5. What are some of the most promising future automotive electronic systems and technologies that are being developed in automotive industry? (3)

6. How does electromagnetic interference (EMI) impact the performance and safety of electronic systems in vehicles? (3)

7. List the advantages of electronic suspension system. (3)

8. Explain the types of Hybrid Vehicles. (3)

9. Mention the applications of object detection in autonomous vehicles. (3)

10. List the benefits of collision warning and avoidance system. (3)

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

Module I

11. a) Explain the working of charging system in an automobile. (8)

    b) Compose a note about the working of VR sensor with relevant diagram. (6)

OR

12. a) Explain the working of power steering with neat sketch? (8)

b) What is hall effect? Discuss about a position sensor using the principle of hall effect. (6)

Module II

13 a) Discuss about an EGR valve control with a relevant diagram. (7)

b) Explain pilot injection, main injection, advanced injection, post injection and retarded post injection. (7)

OR

14 a) Differentiate throttle body and multi-port fuel injection system. (7)

b) Discuss about the Emission Control systems in an automobile. (7)

Module III

15 a) What is On-board diagnostics (OBD) in modern vehicles, and how does it work to diagnose and monitor engine and emission systems? Additionally, what are some of the benefits of OBD systems for vehicle owners and technicians? (7)

b) Discuss some of the most common safety and security systems used in modern automobiles, how do these systems work to prevent accidents and theft? (7)

OR

16 a) Discuss about the key parameters that must be controlled in Spark Ignition (SI) and Compression Ignition (CI) engines to achieve optimal performance, efficiency, and emissions? (8)

b) Describe the commonly used methods for controlling engine cooling and warm-up in automobiles, and how do they affect engine performance and fuel efficiency? (6)

Module IV

17 a) Explain the working of Electrical Vehicle (EV) with layout. (7)

b) What are fuel cells? And how they are used in automobiles? (7)

OR

18 a) Explain the working of CNG Electric Hybrid Vehicle. (7)

b) Describe about the working of electronic stability control system. (7)

Module V

19 a) Compile about dynamic vision system in an autonomous vehicle? (7)

b) Explain the types of low tire pressure warning system and benefits. (7)

OR

20 a) Write about the object detection system and applications. (8)

b) Explain about the basic structure of vehicle intelligence. (6)

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