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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (R, S) Exam April 2025 (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  | Explain main function of following sensors   | (3) |
|    | a) Lambda sensor   |     |
|    | b) Spark knock sensor  |     |
|    | c) MAP sensor  |     |
| 2  | What is detonation?  | (3) |
| 3  | Can airbags be dangerous in any circumstances, and what precautions should be taken to ensure their safe deployment? | (3) |
| 4  | With neat sketch explain oil pressure sensor working.  | (3) |
| 5  | Draw and explain basic structure of vehicle intelligence.  | (3) |
| 6  | Explain Open loop and closed loop control system in the bases of Digital engine control system.                      | (3) |
| 7  | List the application of mobile robot vision in vehicle information system.   | (3) |
| 8  | Explain adaptive cruise control system with a neat sketch.   | (3) |
| 9  | Explain traction control system in an automobile.  | (3) |
| 10 | Explain the types of Hybrid Vehicles.  | (3) |

**PART B**

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

**Module I**

- |    |   |     |
|----|---|-----|
| 11 | a) Explain the different strokes for a four stroke SI engine, with suitable diagrams. | (7) |
|    | b) Differentiate between 2 stroke and 4 stroke engines.                               | (7) |

**OR**

- |    |  |     |
|----|--|-----|
| 12 | a) What do you mean by Ignition in an IC engine? What are the components of an ignition system and explain each of them? | (7) |
|----|--|-----|



- b) Advantages and disadvantages of battery ignition system. (7)

**Module II**

- 13 a) Explain EGR valve control with a relevant diagram. (7)  
b) Explain the working of VR sensor with relevant diagram. (7)

**OR**

- 14 a) Explain the working of Multi Point Fuel Injection System (MPFI) with, layout. (7)

**Module III**

- 15 a) What is the purpose of On-board diagnostics (OBD) in modern vehicles, and how does it work to diagnose and monitor engine and emission systems? (7)  
b) Explain the Three-way Catalyst (TWC) Converter and its use in automobile. (7)

**OR**

- 16 a) What are some common security and warning systems used in modern automobiles and how do they work to prevent accidents? (7)  
b) What are some of the common methods used for engine cooling and warm-up control, and how do they impact engine performance and fuel efficiency? (7)

**Module IV**

- 17 a) Explain why Antilock Braking System (ABS) is needed. Draw a schematic which depict the configuration of ABS. (14)

**OR**

- 18 a) Explain the working of Electrical Vehicle (EV) with layout. (7)  
b) What are fuel cells? How they are used in automobiles? (7)

**Module V**

- 19 a) Explain object detection system and applications. (7)  
b) Explain the types of low tire pressure warning system and benefits. (7)

**OR**

- 20 a) Emission Control systems in an automobile. (7)  
b) What is dynamic vision system in an autonomous vehicle? (7)

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