Exam Date & Time: 22-Jun-2024 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

VI SEMESTER B.TECH END SEMESTER MAKE UP EXAMINATIONS, JUNE 2024

AUTOTRONICS [AAE 4040]

Marks: 50 **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1) Sketch and explain the working principle and applications of Lambda sensor of the engine exhaust system. (3)

A)

B) With suitable circuit diagram, prove that output voltage of linear potentiometer varies linearly with the displacement of the system. (3)

C) Classify the vehicle temperature sensor based on the working principle. With neat sketch explain the working of the Thermocouple sensor. (4)

2) Identify and explain the features of different fuel spray patterns obtained from electromagnetic fuel injector. (3)

A)

B) Sketch the layout of distributor less ignition system and explain the important features and function of an individual components. (4)

C) Explain the significance of electrode gap and heat range on the performance of spark plug. (3)

3) Elaborate the working and features and different modes of the intelligent lighting system. (3)

A)

B) Classify the typical network topology system of a passenger vehicle and explain the important features of the same. (4)

C) With suitable example explain the working of seven segment display. (3)

4) Sketch the layout of a Stator motor and explain the stages involved in the cranking of IC (4)

Engine.

A)

B) Sketch the layout of throttle actuator of the vehicle adaptive cruise control system and explain the working of the same. (3)

C) Identify the sensors and actuators involved in Active Suspension System. With suitable layout explain the working of the same. (3)

5) Explain the control modes involved in Hill Hold Control and Hill Descent Control system of modern vehicles. (4)

A)

B) Analyse the use of electronic stability program module in understeer and oversteer driving conditions. (3)

C) Define electrical machines and with suitable sketch explain any two types of DC motors based on the position of armature and field coil. (3)

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