Exam Date & Time: 24-Jun-2024 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

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

AUTOTRONICS [AAE 2229]

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

A

Answer all the questions.

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

1) Explain the function of ultrasound sensors in a vehicle and how they contribute to managing adaptive cruise control mode. (3)

A)

B) Categorize and elucidate the characteristics of various solid-state switches employed within the automotive sector. (4)

C) Illustrate the operation and attributes of a hybrid stepper motor alongside its relevant applications in the automotive sector. (3)

2) Describe how cell voltage is generated in the lead-acid battery of a vehicle, and discuss the techniques employed to monitor the battery's lifespan. (3)

A)

B) Explain the function and winding features of the starter motor solenoid system. (3)

C) Elaborate on the prerequisites, characteristics, and functionality of vehicle windscreen washer and wiper systems. (4)

3) Recognize and distinguish among the various types of message addressing methods utilized in vehicle communication systems. (3)

A)

B) Sketch the block diagram of Flex Ray communication system and explain the features of the same. (4)

C) With suitable example explain the importance of OBD tool in engine diagnosis process. (3)

4) Describe the purpose, specifications, and materials utilized in automotive switches. (3)

A)

B) Explain the importance of ignition coil in vehicle starting system and classify them based on mounting and number of sparks produced. (4)

C) Analyze the importance and features of Hydraulic Brake Assist (HBA) and Hydraulic Fading Compensation (HFC) system of a vehicle. (3)

5) Identify the different occupant safety system available in vehicle and with suitable layout explain the working Airbag system. (4)

A)

B) Enumerate the different pollutants discharged from a compression ignition (CI) engine and elaborate on the factors contributing to their formation. (3)

C) With suitable layout. describe the closed loop control system of a manual cruise control mode of a vehicle. (3)

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