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15EC561

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Automotive Electronics

Time: 3 hrs.   Max. Marks: 80

Note: *Answer any FIVE full questions, choosing*
ONE full question from each module.

Module-1

1 a. Define the engine performance terms power, BSFC, torque and volumetric efficiency with relevant formulae and their units. **(08 Marks)**
   b. Explain in detail the operating principle including charging, eliciting the electro chemical processes in the lead cell. **(08 Marks)**

OR

2 a. What are the major controller inputs and outputs from / to engine? Show their connection between engine and controller. **(08 Marks)**
   b. Explain the electronic fuel control system with a block diagram. **(08 Marks)**

Module-2

3 a. Explain the working of mass flow sensor with relevant diagrams. **(08 Marks)**
   b. Explain in detail with suitable drawings the principle of operation of exhaust gas recirculation actuator. **(08 Marks)**

OR

4 a. Write short notes on the following :
      i) Optical crank shaft position sensor
      ii) Piezo electric knock sensor. **(08 Marks)**
   b. What is an EGO sensor? What are the desirable EGO characteristics? Explain its witching characteristics. **(08 Marks)**

Module-3

5 a. Explain in brief the real time capability of software requirements detailing structure, different interrupt controls with necessary examples and time frame. **(08 Marks)**
   b. Explain in detail with relevant block diagram and graph the distributor less ignition system. **(08 Marks)**

OR

6 a. Explain in detail with drawings and interfacing block diagram with controller the idle air control. **(08 Marks)**
   b. Explain with diagram the engine control system using speed density method. **(08 Marks)**

Module-4

7 a. What are the CAN protocol layers? What are the four different frames? Explain in detail. Also write the message format. **(08 Marks)**
   b. Explain in detail with suitable drawings and block diagrams the electronic suspension system. **(08 Marks)**

OR

8 a. Explain the purpose of coupling of networks and examples of networked vehicles. (08 Marks)
   b. Explain with suitable drawings the electronic steering control. (08 Marks)

Module-5

9 a. Explain in detail the low tire-pressure warning system with relevant drawings. (08 Marks)
   b. Explain the concept of automatic driving control with suitable block diagrams. (08 Marks)

OR

10 a. Briefly explain how sensor multiplexing and control signal multiplexing are used in automotive electronics with suitable block diagrams. (08 Marks)
   b. Briefly explain how expert systems can be used in automotive electronics. (08 Marks)

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