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M.Tech. Degree Examination, June/July 2011
Automotive Electronics

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1 a. Explain the different strokes for a four stroke SI engine, with suitable diagrams. (08 Marks)
b. What do you mean by Ignition in an IC engine? What are the components of an ignition system and explain each of them. (12 Marks)
- 2 a. Discuss the effect of air /fuel ratio on performance of an SI engine. (04 Marks)
b. What is an EGO sensor? What are the desirable EGO characteristics? Explain its switching characteristics. (08 Marks)
c. What is hall effect? Explain a position sensor using principle of hall effect? Compare it with magnetic reluctance position sensor. (08 Marks)
- 3 a. Explain an optical method of measuring engine speed. (04 Marks)
b. Explain the structure, characteristics and working principle of a MAP sensor. (06 Marks)
c. Explain the role construction and working of an EGR actuator. (06 Marks)
d. What is a catalytic converter and explain the desired functions of a catalytic converter. (04 Marks)
- 4 a. Explain with a neat block diagram, electronic fuel control system. (10 Marks)
b. Explain the following engine performance terms
i) Power ii) BSFC iii) Torque iv) Volumetric efficiency. (10 Marks)
- 5 a. Explain the micro controller based cruise control, with a suitable block diagram. (10 Marks)
b. Explain with a suitable block diagram, instrumentation system used for vehicle speed measurement that uses digital speed sensor. (08 Marks)
c. An oxidizing catalytic converter has a conversion efficiency of 98% at 300°C. If the mass air flow rate of gas in to the converter is 6 kg/hr. Calculate the exhaust air flow rate in kg/hr. (02 Marks)
- 6 a. Explain any two conventional methods of engine diagnostics? What are the limitations? (08 Marks)
b. Explain the principle of electronic air bag system, with a neat block diagram. (10 Marks)
c. A typical coolant sensor has a resistance of 100 K Ω at - 40° connected to a reference voltage source of 3V through a fixed resistance of 50 K. Calculate the sensor output voltage. (02 Marks)
- 7 a. Explain the principle of collision avoidance warning system, using a suitable block diagram. (10 Marks)
b. Explain : i) Dead lock reckoning navigation
ii) Sign post navigation. (10 Marks)
- 8 Write short notes on :
a. Remote keyless entry
b. ABS
c. GPS application in automobiles
d. Electrically controlled steering. (20 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification number will be treated as malpractice.

