I Semester [ Digital Electronics ]

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12EC117

# M.Tech. Degree Examination, Dec.2013/Jan.2014
## Automotive Electronics

Time: 3 hrs. Max. Marks:100

**Note:** ***Answer any FIVE full questions.***



1 a. List the major components of 4-storke/cycle, gasoline fueled SI engine. **(04 Marks)**
b. With neat diagram, explain the four strokes of a typical modern Gasoline-Fueled SI engine. **(10 Marks)**
c. Explain in detail the intake manifold and fuel metering. **(06 Marks)**

2 a. What is spark pulse generation? Explain primary current waveform. **(04 Marks)**
b. What is ignition timing? With a neat sketch explain breaker point operation. **(08 Marks)**
c. What are drive train? With schematic explain planetary gear system. **(08 Marks)**

3 a. With a block diagram, explain typical engine control system and list the variable to be measured associated in an engine control configuration. **(08 Marks)**
b. What are mass Air flow rate (MAF) sensor? Write associated electronic signal conditioning circuit and highlight the importance of binary counter. **(06 Marks)**
c. With a neat diagram, explain strain gauge MAP sensor. **(06 Marks)**

4 a. How do you measure crankshaft angular position? Explain magnetic reluctance crankshaft position sensor. **(08 Marks)**
b. What is hall effect? Explain hall effect position sensor. **(08 Marks)**
c. Explain throttle angel sensor. **(04 Marks)**

5 a. Explain in detail $ZrO_2$ EGO sensor. Describe EGO mounting and structure and also describe characteristics of EGO sensor. **(10 Marks)**
b. With a neat schematic of a solenoid, explain fuel injector. **(06 Marks)**
c. Write a note on idle speed control. **(04 Marks)**

6 a. Explain in brief digital engine control system and illustrate with aid of lookeep table engine crank and engine warmup modes and write the expression for mass of fuel to be delivered to cylinder. **(12 Marks)**
b. With aid of control flow diagram explain EGR control. **(08 Marks)**

7 a. What is cruise control system? With aid of control block diagram explain cruise control. **(10 Marks)**
b. Explain antilock braking system. **(10 Marks)**

8 Write short notes on the following:
a. Sample and hold circuit.
b. ON-Board and Off-Board automotive diagnostics.
c. Radio navigation.
d. Electronic HUAC systems. **(20 Marks)**

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