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10ME65

Sixth Semester B.E. Degree Examination, June / July 2014
Mechatronics & Microprocessor

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Discuss a measurement system and its constituent elements. **(08 Marks)**
b. Explain 'programmable logic controller'. **(04 Marks)**
c. Illustrate the basic elements of a microprocessor based engine management system. **(08 Marks)**

2 Illustrate the following proximity sensors:
a. Capacitive type. **(10 Marks)**
b. Pneumatic type. **(10 Marks)**

3 a. Discuss the construction and operation of permanent magnet DC motor. **(08 Marks)**
b. Illustrate any two types of DC motor configurations. **(08 Marks)**
c. Illustrate the construction and working of an electrical relay. **(04 Marks)**

4 a. Discuss the inverting and non inverting configurations of OPAMPS. **(08 Marks)**
b. Illustrate how OPAMPS can be realized for an adding operation. **(05 Marks)**
c. Illustrate a DAQ system. **(07 Marks)**

PART – B

5 a. Present the Boolean expressions, symbols and truth tables for 3 input NAND gate and 3 input NOR gate. **(10 Marks)**
b. Write the Boolean algebra expressions for the following:
i) Commutative law. ii) Associative law. iii) Distributive law. **(06 Marks)**
c. For the circuit shown in Fig. Q5 (c), obtain the expression for Y in terms of X_0, X_1, A and B inputs. **(04 Marks)**

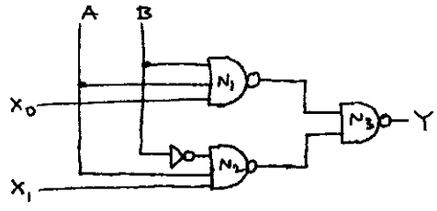

Fig. Q5 (c)

6 Discuss the following with respect to internal architecture of a microprocessor:
a. A typical memory device. **(10 Marks)**
b. Instruction register. **(10 Marks)**

7 a. Discuss the term 'BUS' with reference to the architecture of a microprocessor. **(10 Marks)**
b. Discuss the different addressing modes used in microprocessors with an example for each. **(10 Marks)**

8 a. Explain fetch, execute and instruction cycles with a diagram. **(06 Marks)**
b. Illustrate the data flow from memory to the data register. **(08 Marks)**
c. Illustrate the terms machine cycle and state, associated with microprocessors. **(06 Marks)**

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