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10ME65

Sixth Semester B.E. Degree Examination, Dec.2016/Jan.2017

Mechatronics and Microprocessor

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1
 - a. Define Mechatronics. With a block diagram, briefly explain the generalized measurement system. (07 Marks)
 - b. State and explain functions of basic elements of a closed loop control system, with a block diagram. (06 Marks)
 - c. Explain with a diagram, the working of an Engine Management system. (07 Marks)
- 2
 - a. Define Sensors and Transducers. Name any three types of sensors and transducers each. (08 Marks)
 - b. State and explain the working principle of Hall Effect sensor. (06 Marks)
 - c. What are proximity sensors? Explain capacitive proximity sensor, with a neat diagram. (06 Marks)
- 3
 - a. With sketch, explain solenoid and state its uses. (06 Marks)
 - b. Explain the working principle of a permanent magnet DC motor. How it is used for positive control drive. (08 Marks)
 - c. Sketch and explain the working of a stepper motor. (06 Marks)
- 4
 - a. Define signal conditioning. What are the necessity of signal conditioning? (05 Marks)
 - b. Define the following filters with frequency versus gain curve :
i) Low pass ii) High pass iii) Band pass iv) Band stop. (10 Marks)
 - c. What are the characteristics of an ideal operational amplifier? (05 Marks)

PART – B

- 5
 - a. Discuss briefly with a block diagram, organization of a typical microcomputer system. (08 Marks)
 - b. State Demorgan's theorems. Also draw logic circuits for the same. (06 Marks)
 - c. With the help of symbols and truth table, explain NOR and NAND gates. (06 Marks)
- 6
 - a. Explain with neat sketch, the architecture of INTEL 8085 microprocessor. (12 Marks)
 - b. What is a Microcontroller? How are microcontrollers classified? Briefly explain each. (08 Marks)
- 7
 - a. Explain the following terminology related to microprocessor : (08 Marks)
i) Program counter ii) Flag register iii) Stack pointer iv) Accumulator.
 - b. Explain the flow of instruction sets of a 8085 microprocessor. (08 Marks)
 - c. List out the functions of ALU. (04 Marks)
- 8
 - a. Define CPU and state its functions. (06 Marks)
 - b. How instructions and data flow occurs in microprocessors? (08 Marks)
 - c. Define the following : i) System clock ii) System clock frequency
iii) Clock period iv) Memory access time. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.