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10ME65

Sixth Semester B.E. Degree Examination, Dec.2017/Jan.2018

**Mechatronics and Microprocessor**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. Define mechatronics. State the major differences between conventional and mechatronic product design approach. (08 Marks)  
b. What is sequential controller and explain with a block diagram the working of domestic washing machine. (12 Marks)
- 2 a. Explain how sensing is achieved by an incremental optical encoder. (08 Marks)  
b. Explain the following performance terminologies of transducers:  
i) Accuracy ii) Repeatability  
iii) Drift iv) Speed of response (06 Marks)  
c. Explain the principle of operation of Hall effect sensor. (06 Marks)
- 3 a. Differentiate between a diode, thyristor and transistor. (06 Marks)  
b. Explain the working principle of a permanent magnet D.C. motor. How it is used for positive control drives? (08 Marks)  
c. Sketch and explain the working of an stepper motor. (08 Marks)
- 4 a. What is the significance of operational amplifier? How it is used in an inverting amplifier circuit? (10 Marks)  
b. What is multiplexer and de multiplexer? Where they are used? (06 Marks)  
c. Write a note on digital signal processing. (04 Marks)

**PART – B**

- 5 a. With the help of a block diagram, explain briefly the general form of a microprocessor system. (08 Marks)  
b. What are logic gates? Discuss AND and OR gates with their truth tables for two inputs. (08 Marks)  
c. Write a note on representation of real numbers. (04 Marks)
- 6 a. Explain in detail with a block diagram, the architecture of Intel 8085 A microprocessor. (10 Marks)  
b. What are micro controllers? Explain the general form of a micro controller. (10 Marks)
- 7 a. Explain the classification of instructions for the Intel's 8085 microprocessor. (10 Marks)  
b. With a neat flow chart, discuss the programming process. (10 Marks)
- 8 a. Distinguish between instruction cycle, machine cycle and T-state. (10 Marks)  
b. Draw and explain the timing diagram for opcode fetch operation. (10 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, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.