USN ☐☐☐☐☐☐☐☐☐☐

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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