

Paper Id:

140502

Roll No:

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B.TECH.
(SEM -V) THEORY EXAMINATION 2019-20
MECHATRONICS AND MICROPROCESSOR

Time: 3 Hours**Total Marks: 70****Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A**

1. **Attempt all questions in brief.** **2 x 7 = 14**
- a. What is actuator?
 - b. Explain pulse modulation.
 - c. Compare RET and POP instruction in microprocessor.
 - d. What is subroutine?
 - e. Write important applications of 8085.
 - f. What are the functions of CPU?
 - g. Explain different types of interrupts in 8085.

SECTION B

2. **Attempt any three of the following:** **7 x 3 = 21**
- a. What is Hall effect? Explain with a neat sketch the principle of Hall effect sensor.
 - b. Explain the following:
 - (i) Primary & Secondary transducer.
 - (ii) Active & Passive transducer.
 - (iii) Analog & Digital transducer
 - c. What is data acquisition? Explain with a block diagram, the DAQ system.
 - d. Write short notes on the following :
 - (i) System timing
 - (ii) Character representation
 - e. Explain the working principle of the following with sketch:
 - (i) Eddy current proximity sensors.
 - (ii) Capacitive proximity sensors.

SECTION C

3. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) What is mechatronics? What are the objectives of mechatronics? Explain briefly the elements of a measuring system with an example
 - (b) What is the difference between a sensor & transducer? What do you mean by the term filtering & filter? How are filters classified?
4. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) Define signal conditioning. What are the necessities for signal conditioning?
 - (b) What is an operational amplifier? Why it is called an operational amplifier?
5. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) Explain with the block diagram, how a microprocessor based control system is used to control the focusing and exposure of an automatic camera.
 - (b) Explain briefly the evolution of microprocessor. Write the basic relationship of an operational amplifier.
6. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) Explain with a block diagram the flow of instruction word & flow of data word in a microprocessor.
 - (b) Write short notes on the following:
 - (i) Assembly language programming
 - (ii) Fetch cycle & write cycle.
7. **Attempt any one part of the following:** **7 x 1 = 7**
- (a) Draw the functional block diagram of the Intel 8085 microprocessor.
 - (b) With the help of neat sketch, explain the following:
 - (i) Address bus.
 - (ii) Data bus.
 - (iii) Control signals (bus).