

# CBCS SCHEME

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18ME744

## Seventh Semester B.E. Degree Examination, Feb./Mar. 2022 Mechatronics

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Define mechatronics. Briefly explain various evolution stages of mechatronics. (10 Marks)
- b. Explain with block diagram the working of engine management system. (10 Marks)

OR

- 2 a. Define transducer. Explain primary and secondary transducers with examples. (10 Marks)
- b. What is hall effect? Explain the working of hall effect sensors with neat sketch and mention their applications. (10 Marks)

### Module-2

- 3 a. Define signal conditioning. Explain any four methods adopted for signal conditioning. (10 Marks)
- b. What is the significance of operational amplifiers? How it is used as non-inverting amplifier? (10 Marks)

OR

- 4 a. Define Solenoids. Explain two types of solenoids and mention their applications. (10 Marks)
- b. With neat sketch, explain the construction and working principle of permanent magnet DC motor. (10 Marks)

### Module-3

- 5 a. Explain with neat block diagram, the general form of microprocessor system. (10 Marks)
- b. What is microcontroller? Explain the classification of micro controllers. (10 Marks)

OR

- 6 a. What are the different types of registers used in 8085 microprocessor? Explain with block diagram. (10 Marks)
- b. What are buses? Explain different types of buses. (10 Marks)

### Module-4

- 7 a. Define PLC (Programmable Logic Controller). Explain with a neat diagram working of a PLC. (10 Marks)
- b. Briefly explain the basic structure of ladder logic diagram. (10 Marks)

OR

- 8 a. Explain various requirements for selecting a PLC. (10 Marks)
- b. List the applications of PLC's in:  
(i) Industries (ii) Power Stations (iii) Education sector  
(iv) Domestic (v) Commercial sectors (10 Marks)

**Module-5**

- 9 a. Write notes on:
- (i) Hydrostatic bearings
  - (ii) Linear motion guide ways (linear bearing with balls) (10 Marks)
- b. Briefly explain the elements of open and closed loop control systems with neat block diagram. (10 Marks)

**OR**

- 10 a. Explain the different stages of mechatronic design process. (10 Marks)
- b. List the differences between traditional and mechatronic design process. (10 Marks)

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