

# CBCS SCHEME

18ME744

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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)

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 on the back of the page will be treated as malpractice.

Module-5

- 9 a. Write notes on:  
(i) Hydrostatic bearings (10 Marks)  
(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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