



# CBCS SCHEME

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21MT743

## Seventh Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Mechatronics System Design

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Explain integrated design issues in mechatronics. (10 Marks)
- b. Explain mechatronics design process in detail. (10 Marks)

OR

- 2 a. Explain key elements of mechatronics. (10 Marks)
- b. Explain the application of mechatronics in different fields. (10 Marks)

### Module-2

- 3 a. Reduce the transfer function and draw the block diagram.

$$T(s) = \frac{s^2 - 3s + 4}{s^4 - 2s^3 - 5s^2 + 2s - 9}$$

(10 Marks)

- b. Reduce the following mechanical system into block diagram. Refer Fig.Q3(b).

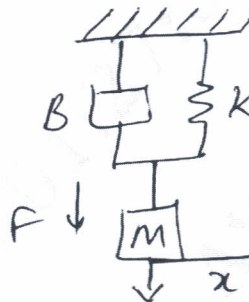


Fig.Q3(b)

(10 Marks)

OR

- 4 a. Arrive at the block diagram for bridge circuit system. (10 Marks)
- b. Arrive at block diagram for transference system. (10 Marks)

### Module-3

- 5 a. Explain fault finding techniques that are used in micro processor based system. (10 Marks)
- b. Briefly explain the systematic fault location methods. (10 Marks)

OR

- 6 a. Explain transient state and steady state response of a signal. (10 Marks)
- b. Explain natural and forced response with an example. (10 Marks)

### Module-4

- 7 a. Explain the data acquisition system with block diagram. (10 Marks)
- b. Explain application, filtering and multiplexing. (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 eg, 42+8 = 50, will be treated as malpractice.

OR

- 8 a. Explain digital to analog converter. (10 Marks)  
b. Explain analog to digital converter. Find the approximate digital value for 11.2. (10 Marks)

Module-5

- 9 a. Explain mass – spring – damper system for physical based model. (10 Marks)  
b. Explain position control of a permanent magnet DC gear motor. (10 Marks)

OR

- 10 a. Explain auto control system for greenhouse temperature. (10 Marks)  
b. Explain transducer calibrations system for automotive application. (10 Marks)

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