

CBCS SCHEME

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18ME744

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024

Mechatronics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain the scope and multi-disciplinary scenario of mechatronics with neat block diagrams. (10 Marks)
- b. Explain with a neat sketch the working principle and characteristics of Linear Variable Differential Transformer (LVDT). (10 Marks)

OR

- 2 a. Explain with a neat diagram the elements of an engine management system. (10 Marks)
- b. Explain with a neat diagram the working principle of Hall effect sensor. (10 Marks)

Module-2

- 3 a. Explain what is filtering and different types of filters with neat diagrams. (10 Marks)
- b. Explain the following with neat sketches:
 - (i) Hybrid stepper motor
 - (ii) Pulse width modulation (10 Marks)

OR

- 4 a. Explain with a neat block diagram the objectives, functions and components (units) of a SCADA system. (10 Marks)
- b. Explain with neat circuit diagrams the various types of DC motors with field coils and also their torque versus speed characteristics. (10 Marks)

Module-3

- 5 a. Explain with a neat block diagram the architecture of Intel's 8085A microprocessor. (15 Marks)
- b. Distinguish between Microprocessor and Microcontroller. (05 Marks)

OR

- 6 Explain the following with neat diagrams:
 - a. Interrupt lines/pins
 - b. Input/output buffers
 - c. Program counter
 - d. Flags (20 Marks)

Module-4

- 7 a. Explain with a neat sketch the basic structure of PLC. (10 Marks)
- b. Explain with neat sketches, the various symbols used in a ladder diagram. (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 Explain the following pertaining to PLC:

- a. Shift registers
- b. Data handling
- c. Jump control
- d. Latching

(20 Marks)

Module-5

- 9 a. Explain with neat sketches the different types of guide ways. (10 Marks)
- b. Explain with a neat flow chart the stages of mechatronics design process. (10 Marks)

OR

10 a. Explain the following with neat sketches:

- (i) Hydrostatic bearing (10 Marks)
 - (ii) Types of hydrodynamic bearings (10 Marks)
- b. Explain with a neat sketch the various parts or subsystems of pick and place robot. (10 Marks)
