



CBCS SCHEME

18ME744

Seventh Semester B.E. Degree Examination, June/July 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. Define Mechatronics. What are its objectives? Explain with a block diagram the key components in a Typical Mechatronics system. (10 Marks)
- b. Explain with block diagram, of basic elements of Feedback control system with example. (10 Marks)

OR

- 2 a. Explain with sketch Automatic washing machine working as a sequential microprocessor based controlled system. (08 Marks)
- b. How are Transducer Classified? Give suitable examples. (04 Marks)
- c. Explain with neat sketch- Hall Effect principle and working of Hall Effect sensors. (08 Marks)

Module-2

- 3 a. Define Signal Conditioning. Explain the process of signal conditioning. (04 Marks)
- b. With neat sketch, explain the components of OPAMP. List the types of OPAMPS. (06 Marks)
- c. Explain in details : (10 Marks)
- (i) Multiplexer
 - (ii) Data acquisition system.

OR

- 4 a. Explain with sketches, (12 Marks)
- (i) Relay
 - (ii) Thyristors.
 - (iii) MOSFETs.
- b. What are stepper motors? Explain with sketch the principle of working of variable reluctance stepper motor. (08 Marks)

Module-3

- 5 a. Draw the formal structure of a microprocessor based system and state the functions of each element. (10 Marks)
- b. What is microcontroller? Distinguish between microprocessors and micro controllers. (10 Marks)

OR

- 6 a. Explain in details with block diagram. The Architecture of Intel's 8085A microprocessors. (12 Marks)
- b. Explain the following : (08 Marks)
- (i) BUS
 - (ii) Fetch cycle.

Module-4

- 7 a. Define Program Logic Controllers with block diagram. Explain Basic Internal structure of PLC. (10 Marks)
b. Explain in details Terminology of Ladder Logic diagram and Basic Ladder Logic symbols. (10 Marks)

OR

- 8 a. What are types of PLC programming languages? Explain with characteristics and examples. (10 Marks)
b. Explain the various requirements for selecting a PLC and list the applications of PLC's. (10 Marks)

Module-5

- 9 a. Why CNC machine tools are considered as Mechatronic system. What are the important Machine elements of CNC machine? (10 Marks)
b. Explain with sketch,
(i) Hydraulic bearing. (10 Marks)
(ii) Hydrodynamic bearing

OR

- 10 a. Explain the different stages of mechatronics design process. (10 Marks)
b. List the difference between Traditional and Mechatronics design process. (10 Marks)
