

# CBCS SCHEME

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17ME753

## Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 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 objectives of mechatronics. (05 Marks)
- b. Explain the elements of mechatronics system design. (08 Marks)
- c. Explain with a neat diagram the working of photoemissive transducer. (07 Marks)

OR

- 2 a. Explain the evolution levels of mechatronics. (08 Marks)
- b. Explain the specifications of a transducer or sensor. (06 Marks)
- c. Write a note on proximity switches. (06 Marks)

### Module-2

- 3 a. Explain briefly the basic elements of a microprocessor. (05 Marks)
- b. Explain the requirements for control and their implementation in a micro controller. (05 Marks)
- c. Explain briefly the following :  
i) State ii) Bus iii) Flags iv) Interrupts. (10 Marks)

OR

- 4 a. Distinguish between operand, mnemonics and opcode. (03 Marks)
- b. Explain the different types of instructions and addressing modes of a microprocessor. (09 Marks)
- c. Explain the classification of micro controllers. (08 Marks)

### Module-3

- 5 a. Write the features of a typical PLC. What is a ladder diagram and explain the various symbols used in a ladder diagram. (10 Marks)
- b. Explain with a neat diagram the functional requirements of an industrial robot? (10 Marks)

OR

- 6 a. Explain Latching with an example. (06 Marks)
- b. Explain the methods used for input/output processing (06 Marks)
- c. Explain with neat sketch a typical pneumatic actuator system for Serco control. (08 Marks)

**Module-4**

- 7 a. Explain the mechanical aspects of motor selection and also motor torque – speed characteristics. (09 Marks)
- b. How do you classify electrical systems? (03 Marks)
- c. Explain with a neat sketch the working of single phase squirrel cage induction motor. (08 Marks)

**OR**

- 8 a. Write a detailed note on permanent magnet DC motor. (10 Marks)
- b. Explain with a neat diagram the stepper motor specifications of characteristics. (10 Marks)

**Module-5**

- 9 a. Compare with neat diagrams the hydraulic and pneumatic power supplies. (10 Marks)
- b. Explain with neat diagram the working of pressure limiting and pressure sequence valves. (10 Marks)

**OR**

- 10 a. Explain with neat diagrams the working of lift and pilot operated systems. (10 Marks)
- b. Explain with a neat diagram the following : (10 Marks)
- i) Double acting cylinder
- ii) Vane motor.

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