

--	--	--	--	--	--	--	--	--	--

## Seventh Semester B.E. Degree Examination, July/August 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. What is Mechatronics? Give its advantages, disadvantages and applications. (10 Marks)
- b. Explain with a block diagram the working of a microprocessor controlled Washing Machine. (10 Marks)

**OR**

- 2 a. What is transducer? Give complete classification of transducer. (07 Marks)
- b. Explain following with neat sketch:
  - i) Hall effect sensor
  - ii) Eddy current proximity sensor. (13 Marks)

### Module-2

- 3 a. Explain the Range of weight of binary number system, with an example. (08 Marks)
- b. Write the truth tables for OR, AND, NOT, NOR and NAND gates for three inputs. (12 Marks)

**OR**

- 4 a. Write the architecture of 8085A micro processor. (10 Marks)
- b. Explain the following terms micro processor:
  - i) Fetchcycle
  - ii) Instruction and data flow
  - iii) Bus
  - iv) State
  - v) Opcode. (10 Marks)

### Module-3

- 5 a. What is microcontroller? Explain architecture of 8051 micro controller. (12 Marks)
- b. Explain about the classification of microcontroller. (08 Marks)

**OR**

- 6 a. Explain with sketch the architecture of a programmable logic controller. (12 Marks)
- b. Explain the timers and counters in PLC. (08 Marks)

### Module-4

- 7 a. Briefly explain types of gear trains used as mechanical actuators. (10 Marks)
- b. Discuss about the following types of electrical actuators:
  - i) DC drives
  - ii) Stepper motor. (10 Marks)

**OR**

- 8 a. Sketch and explain the working of a recirculating ball screw. (08 Marks)  
b. Explain the following with neat sketches:  
i) Relays  
ii) Solenoids  
iii) Permanent magnet DC motor. (12 Marks)

**Module-5**

- 9 a. What are Mathematical model? Explain briefly. (08 Marks)  
b. Explain briefly the following basic building blocks of mechanical system:  
i) Springs  
ii) Dashpots  
iii) Masses. (12 Marks)

**OR**

- 10 a. Explain briefly the various fluid systems building blocks. (10 Marks)  
b. Explain briefly the following thermal system building blocks:  
i) Resistance  
ii) Capacitance. (10 Marks)

\* \* \* \* \*