

Code: ME7T1

**IV B.Tech - I Semester – Regular/Supplementary Examinations
March - 2021**

**MECHATRONICS
(MECHANICAL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

- a) Define Mechatronics.
- b) State the advantages and disadvantages of Mechatronics system.
- c) What are sensors and transducers?
- d) What is a flow control valve?
- e) Name any four solid state switches.
- f) List out the basic building blocks of Hydraulic and Thermal systems.
- g) What is transfer function?
- h) What is Proportional control and what is it's limitation?
- i) What is a Microprocessor?
- j) What is a shift register?
- k) State any four criteria for selection of PLC.

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) What is Mechatronics design and state the advantages of such a system. 8 M
- b) Explain with neat sketches, Piezoelectric sensor and capacitive proximity sensor. 8 M
3. a) Explain the working of spool valve with neat sketch. 8 M
- b) Explain the working principle of a brush-type DC motor. 8 M
4. a) Explain the basic building blocks of mechanical system (linear) with their governing equations. 8 M
- b) Derive an expression for finding out the overall transfer function of a system with negative feedback. 8 M
5. a) What is closed loop system? With a neat line diagram, explain the elements. 8 M
- b) Sketch and explain the architecture of 8085 Microprocessor. 8 M
6. a) Define PLC. Explain the basic architecture of PLC. 8 M
- b) Explain the uses of Fuzzy expert system. 8 M