U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January 2024 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Mechanical Engineering **Duration: 3 hrs.**
Course Code: 16ME7DCMCT **Max Marks: 100**
Course: Mechatronics

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably be assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1	a)	Define Mechatronics? With a block diagram explain the basic elements of measurement system.	**10**
	b)	Explain with a block diagram, the design of Mechatronic system for a consumer product.	**10**

UNIT - II

2	a)	What is light sensor? Explain with a neat sketch photo-resistor type light sensor and mention its applications.	**08**
	b)	Explain the principle of working inductive proximity sensor? Mention its applications	**08**
	c)	Explain the working principle of piezoelectric sensor.	**04**

UNIT - III

3	a)	With a neat sketch, explain the mechanical relay switch. Mention the problems associated with this switch.	**06**
	b)	With V-I characteristics, explain working of TRIAC.	**06**
	c)	With a neat sketch, explain the working principle of variable reluctance stepper motor.	**08**

OR

4	a)	Describe with a neat sketch the working of pilot operated check valve.	**06**
	b)	Illustrate with sketch the working of 4/3 sliding spool direction control valve.	**08**
	c)	Explain with a neat sketch the working of balanced vane hydraulic motor.	**06**

UNIT - IV

5	a)	Design the 4-bit asynchronous up counter with truth table.	**07**
	b)	Explain with truth table and logic diagram 4x2 encoder.	**07**

	c)	Design successive approximation register type ADC for any number of input bits.	**06**

OR

6	a)	With a relevant expression explain integrating and differential op-amps.	**08**
	b)	With a neat circuit diagram explain with relevant equation the balanced Wheatstone bridge.	**07**
	c)	Explain different types of filters used in signal conditioning.	**05**

UNIT - V

7	a)	List different addressing modes used in 8085 microprocessors. Explain with example.	**12**
	b)	Write an Assembly level language program for addition of two eight bit binary numbers using 8085 microprocessor, with a flow chat explain the logic.	**08**

****