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

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: VII**

Branch: Mechanical Engineering **Duration: 3 hrs.**

Course Code: 20ME7DCMCT **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 be suitably 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	CO	PO	Marks
1	a)	Explain Constituents of a mechatronics system with a block diagram.	CO1	PO1	**10**
	b)	Write about the Mechatronics approach in tool monitoring systems. And briefly explain steps followed in an indirect tool monitoring system.	CO1	PO1	**10**
		OR			
2	a)	Explain how electronics integrate with mechanical systems in mechatronics with examples.	CO1	PO1	**15**
	b)	list types of electronic circuits are used in control systems for mechatronics applications?	CO1	PO1	**05**
		UNIT - II			
3	a)	Explain with an example the working of 6-bit binary weighted resister DAC.	CO2	PO2	**10**
	b)	Define the role of sensors and actuators in the context of MEMS.	CO2	PO1	**10**
		OR			
4	a)	Explain the following terminologies with an example Accuracy, Resolution, Linearity, Span, and Drift.	CO2	PO1	**10**
	b)	What is a relay? mention its applications. List Types of Relays.	CO2	PO1	**10**

			UNIT - III			
	5	a)	Explain the working principle of a DC Motor and list Advantages and Disadvantages of brushless DC motor.	*CO2*	*PO1*	**10**
		b)	What Is a Cam and Follower Mechanism? Explain different types of Cams, Based on the Shape.	*CO2*	*PO1*	**10**
			OR			
	6	a)	Explain Schematic diagram ball-screw drive system used in industrial machines?	*CO2*	*PO1*	**10**
		b)	Explain key Concepts of Electronic Camming and list Applications of Electronic Camming.	*CO2*	*PO1*	**10**
			UNIT - IV			
	7	a)	With a neat Sketch explain sliding spool valve of hydraulic system.	*CO3*	*PO1*	**10**
		b)	Mention types of the directional control valve and tabulate their actuation methods using standard symbols.	*CO3*	*PO1*	**10**
			OR			
	8	a)	Sketch and explain the working of pilot operated check valve.	*CO3*	*PO1*	**10**
		b)	Draw a Schematic of a Package lifting system for LED TVs, explain its working mechanism also draw its hydraulic circuit.	*CO4*	*PO1*	**10**
			UNIT - V			
	9	a)	Sketch and explain Basic Components of Pneumatic System.	*CO6*	*PO1*	**10**
		b)	Sketch and explain the construction and working of Air filter and water trap.	*CO6*	*PO1*	**10**
			OR			
	10	a)	What are the common configurations of directional control valves, and how are they identified.	*CO6*	*PO1*	**05**
		b)	Describe the role of intercoolers and aftercoolers in air compression systems.	*CO6*	*PO1*	**10**
		c)	What factors affect the efficiency of air compressors?	*CO6*	*PO1*	**05**

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