Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 19 / 12/ 2025 **Time: 01:00pm – 04:00pm**

School: School of Engineering	**Program: B.Tech**	
Course Code: MEC3006	**Course Name: Mechatronics**	
Semester: V	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks					

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Name two advantages of using mechatronic system.	**2 Marks**	**L1**	**CO1**
2.	What is significance of sensors in mechatronics	**2 Marks**	**L1**	**CO1**
3.	Differentiate between active and passive transducers.	**2 Marks**	**L1**	**CO1**
4.	What is the function of a proximity sensor?	**2 Marks**	**L1**	**CO2**
5.	Mention two types of pneumatic actuators.	**2 Marks**	**L1**	**CO1**
6.	Define open loop control system.	**2 Marks**	**L1**	**CO2**
7.	What is feedback in control systems?	**2 Marks**	**L1**	**CO2**
8.	List two applications of microcontrollers in mechatronics.	**2 Marks**	**L1**	**CO2**
9.	State the function of solenoid.	**2 Marks**	**L1**	**CO1**
10.	Name any two temperature sensors used in mechatronics	**2 Marks**	**L1**	**CO2**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Explain the working principle of the washing machine with the help of a block diagram	**10 Marks**	**L2**	**CO3**
	b.	Explain the engine management system using a microprocessor with the help of a block diagram	**10 Marks**	**L2**	**CO3**
		Or			
12.	**a.**	Explain the open and closed loop control system with the help of an example	**10 Marks**	**L2**	**CO3**
	b.	Explain the working principle of a microprocessor-based control system of an automatic camera.	**10 Marks**	**L2**	**CO3**
13.	**a.**	What is the photoelectric effect? Explain the transduction principle in photoemissive, photoconductive, and photovoltaic transducers	**10 Marks**	**L3**	**CO4**
	b.	What are thermistors? Write down the relationship between resistance and temperature for the thermistors.	**10 Marks**	**L3**	**CO4**
		Or			
14.	**a.**	Explain how temperature can be measured using a thermocouple. Give a suitable circuit diagram.	**10 Marks**	**L2**	**CO4**
	b.	Explain the principle of operation of a LVDT. What do you mean by the electrical zero position?	**10 Marks**	**L3**	**CO4**
15.	**a.**	Compare the variable reluctance and permanent magnet type stepper motor.	**10 Marks**	**L3**	**CO5**
	b.	In what way are the stepper motors advantageous then the DC and AC motors	**10 Marks**	**L3**	**CO5**
		Or			
16.	**a.**	How do rotary pneumatic actuators work? With a neat diagram, explain this in detail.	**10 Marks**	**L3**	**CO5**
	b.	What is a valve? Describe the principle of operation of a solenoid valve.	**10 Marks**	**L3**	**CO5**
17.	**a.**	Explain the following gates (i) OR (ii) AND (iii) NAND (iv) NOR (v) EX-OR	**10 Marks**	**L4**	**CO6**
	b.	Discuss the microprocessor as a programmable device.	**10 Marks**	**L3**	**CO6**
		Or			
18.	**a.**	Convert $(A193.E)_{16}$ to octal and binary.	**10 Marks**	**L4**	**CO6**
	b.	Convert to decimal numbers (i) 1101 (ii) 1.111 (iii) 1001.011 (iv) 11011.10101	**10 Marks**	**L4**	**CO6**