Reg. No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Question Paper Code	12569

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024
Eighth Semester
Electronics and Communication Engineering
20ECEL809 - ROBOTICS AND AUTOMATION
Regulations - 2020

Duration: 3 Hours   Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks	K-Level	CO
1.	List out the technical features to be considered while designing a robot.	2	K1	CO1
2.	Define robot motion.	2	K1	CO1
3.	List the applications of Encoders.	2	K1	CO2
4.	State the advantages of pneumatic actuator.	2	K1	CO2
5.	Define sensor and transducer.	2	K1	CO3
6.	State robot drive system.	2	K1	CO3
7.	State Lagrange-Euler formulation.	2	K1	CO5
8.	Mention the features of second generation robot programming languages.	2	K1	CO5
9.	How is robot used in spot welding?	2	K1	CO6
10.	Define Artificial in terms of rational thinking.	2	K1	CO6

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

				Marks	K-Level	CO
11.	a)		Explain robot parts and their function with neat diagram.	13	K2	CO1
			OR			
	b)	i)	Elaborate the four common robot configurations with neat sketch.	7	K2	CO1
		ii)	Describe the evolution of Robots.	6	K2	CO1
12.	a)		Explain the construction and working principle of hydraulic actuator.	13	K2	CO2
			OR			
	b)		Illustrate the construction and operation of stepper motor with neat sketch.	13	K2	CO2
13.	a)		Describe the characteristics of Sensors.	13	K2	CO3
			OR			
	b)		Explain the working principle of position sensors with neat sketch.	13	K2	CO3
14.	a)		Elaborate various methods in robot programming, highlighting their capabilities and limitations.	13	K2	CO5

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **12569**

OR

b) Illustrate the fuzzy logic control of a cooling system where the two inputs are temperature and humidity and the output is the power setting of the air conditioning system.   *13 K2 CO5*

15. a) i) Enumerate the function of robot in manufacturing and non-manufacturing applications.   *7 K2 CO6*

    ii) Explain the applications of Machine Learning.   *6 K2 CO6*

OR

b) i) Summarize the concepts and implications of virtual reality.   *7 K2 CO6*

    ii) Explain in detail about Micro and Nano robots.   *6 K2 CO6*

PART - C (1 × 15 = 15 Marks)

16. a) Elaborate on Homogenous Transformations & Matrix representation.   *15 K2 CO4*

OR

b) Describe the working principle of different types of gripper with neat sketch.   *15 K2 CO4*