Reg. No.															

Question Paper Code	12909

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Fifth Semester

Mechanical Engineering

20MEPC502 - ROBOTICS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Define a Robot.	2	K1	CO1
2.	List down the different types of robot joints.	2	K1	CO1
3.	Explain the various types of types of mechanical actuation in gripper.	2	K2	CO2
4.	Define End Effectors.	2	K2	CO2
5.	Classify the types of tactile sensor?	2	K2	CO3
6.	Differentiate between transducer and sensor.	2	K2	CO3
7.	List some End effectors Commands.	2	K2	CO4
8.	Differentiate between Forward kinematics and reverse kinematics.	2	K2	CO4
9.	Discuss about Depalletizing.	2	K2	CO5
10.	What is AGV? Where it is Used?	2	K2	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a) i)	Explain different types of robots.	7	K2	CO1
	ii)	Draw and Explain about various robot joints.	6	K2	CO1
		OR			
	b)	With a neat sketch explain the 3P, TLO, 3R, 2RP and VRO Configuration and discuss the characteristics, work volume and applications of each.	13	K2	CO2
12.	a) i)	Describe the Magnetic Grippers in robot.	8	K2	CO2
	ii)	Draw and explain about vacuum grippers.	5	K2	CO2
		OR			
	b)	Explain briefly the working of various types of stepper motor with its sketches.	13	K2	CO2

13. a) With neat sketch explain the following
    i) Resolvers. *7 K2 CO3*
    ii) Optical Encoders. *6 K2 CO3*

OR

    b) Explain the working principle of piezo electric sensors with neat sketch and also write its applications, advantages and limitations . *13 K2 CO3*

14. a) Derive the forward and reverse transformation of 2-Degree of freedom in two dimensions. *13 K2 CO4*

OR

    b) Explain Motion, End Effectors and Sensor commands with example. *13 K2 CO4*

15. a) How economic analysis is done in Payback method? Explain with examples. *13 K2 CO5*

OR

    b) Briefly explain AGV & RGV types of robots in detail. *13 K2 CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Illustrate the design and selection of various grippers in robotics. *15 K2 CO6*

OR

    b) Sketch the different types of Robot Coordinate System. *15 K2 CO6*