15 JUN 2023

Reg. No.												

Question Paper Code	11894

B.E./B.Tech. - DEGREE EXAMINATIONS, APRIL/MAY 2023

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.	State the Asimov's laws of robotics.	*2,K1,CO1*
2.	Define Payload capacity of robot.	*2,K1,CO1*
3.	Justify why servo motors are preferred than other motors in Robotics?	*2,K2,CO2*
4.	Give some example of robot End effectors.	*2,K1,CO2*
5.	Differentiate between transducer and sensor.	*2,K2,CO3*
6.	Summarize about frame grabber.	*2,K1,CO3*
7.	Differentiate between Forward kinematics and reverse kinematics.	*2,K2,CO4*
8.	List out some End effectors Commands.	*2,K1,CO4*
9.	What are the steps involved in implementing robots in industries?	*2,K1,CO5*
10.	List the various methods used in economic analysis of robot.	*2,K1,CO5*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Describe the four basic robot configurations classified according to the coordinate system.	*13,K2,CO1*
		OR	
	b)	Enumerate various needs and applications of Robot in industrial scenario.	*13,K2,CO1*
12.	a)	Explain the different types of grippers used in robots with neat sketch.	*13,K2,CO2*
		OR	
	b)	Explain the various drive system used with an industrial robot and compare their features, merits and demerits.	*13,K2,CO2*

13. a) How are the images processed and analyzed in a machine vision system? Explain with suitable example. *13,K2,CO3*

OR

b) Explain the working principle of Proximity sensors with neat sketch. *13,K2,CO3*

14. a) Derive the forward and reverse transformation of 3-Degree of freedom in two dimensions. *13,K2,CO4*

OR

b) Explain in detail about powered lead through using teach pendant with a suitable program. *13,K2,CO4*

15. a) Briefly explain AGV types of robots in detail. *13,K2,CO5*

OR

b) Write the importance and operations of safety sensors and safety monitoring. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Illustrate the pay back and rate of return method of economic analysis while implementing robots in industry suitable example problem. *15,K2,CO6*

OR

b) Write the usage of sensor commands in Robotics and solve a program for palletizing 10 parts using VAL programming. *15,K2,CO6*