A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 99312

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2024

Elective

Electrical and Electronics Engineering

19UEE912 – Robotics and Automation

(Regulations 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which one is application of manipulator? CO1- U

   (a) Humanoid Robots (b) Remote handling (c) Micro robot (d) All of the above

2. The main objective of the industrial robot is CO1- U

   (a)To minimize the labour requirement (b) To increase the productivity

   (c) To enhance the life of production machines (d) All of the above

3. The basic components of hydraulic fluid power system _____ CO2-U

   (a) Reservoir (b) Pump and lines

   (c)Actuating devices and control valves (d) All of the above

4. Which of the basic parts of a robot unit would include the computer circuitry that could be programmed To determine what the robot would do? CO2-U

   (a) Controller (b)Sensor (c)arm (d) end effector

5. Grippers are used to_____. CO3-U

   (a) Hold the objects (b) Sense the objects (c) Move the objects (d) Both (a) & (c)

6. What is full form of OCR in tasks of Computer Vision? CO3- U

   (a) Optimum Character Reader (b) Optical Character Reader

   (c) Optimum Castor Reader (d) Optical Castor Reader

7. Which one of the following robots comes under first generation? CO4- U

(a) Information robots (b) Autonomous loading

(c) Autonomous harvesting (d) None of the above

8. The technical name of the Robot hand is called _____ CO4- U

(a) Wrist (b) End effector (c)Gripper (d) none of the above

9. Singularity problems surface when trying to control _____ CO5- U

(a) Robots in Cartesian space (b) Robots in Cylindrical space

(c) Robots in Polar space (d) None of the above

10. Which one of the following robots commonly used for handling at die casting machine? CO5- U

(a) Cylindrical (b) Cartesian (c) Both (a) and (b) (d) None of the above

PART – B (5 x 2= 10 Marks)

11. Define robot CO1- U

12. Which type of drive system is more suitable for heavy load robot application? CO2- U

13. Mention use of machine vision system CO3 -U

14. State Euler angles used in rotation matrix. CO4 -U

15. List the applications of manufacturing and non-manufacturing application area of robotics CO5 -U

PART – C (5 x 16= 80Marks)

16. (a) Explain any four basic robot configurations with neat sketches and narrate individual merits, demerits and applications CO1- U (16)

Or

(b) Discuss the various technical specifications in Robotics. CO1- U (16)

17. (a) Explain the various drive system used with an industrial robot with their selection criteria and compare their features, merits and demerits. CO2- U (16)

Or

(b) State the features of 'Hydraulic and Pneumatic actuators' system with neat sketch. CO2- U (16)

18.	(a)	Explain the different stages of machine vision system and its types of illumination system.	CO3- U	(16)
		Or		
	(b)	Explain in details about Proximity Sensors and Touch sensors with a neat sketch	CO3- U	(16)
19.	(a)	Determine the homogeneous transformation matrix for robotic system.	CO4- U	(16)
		Or		
	(b)	Explain about Jacobian in terms of DH matrices in Robot Kinematics.	CO4- U	(16)
20.	(a)	Explain the various programming methods used in robotics with examples and features of each.	CO5- U	(16)
		Or		
	(b)	Examine the application of spot welding and spray coating in manufacturing using robots.	CO5- U	(16)