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

Question Paper Code:99375

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

Open elective

Civil Engineering

19UEE975 -PRINCIPLES OF ROBOTICS

(Common to CSE,ECE, MECH, EIE ,IT and Chemical Engineering)

(Regulation 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The Robot designed with Cartesian coordinate systems has CO1-U

   (a) Three linear movements

   (b)Three rotational movements

   (c)Two linear and one rotational movement

   (d)Two rotational and one linear movement

2. Robot is derived from Czech word _____. CO1- U

   (a) Rabota (b)Robota (c) Rebota (d) Ribota

3. The Horsepower of motor which has RPM and Torque is 3000 &6 in-lbf respectively is_____ CO2- U

   (a) 0.286 (b) 1.2 (c) 2800 (d) none of these

4. In Fleming's left-hand rule the thumb points towards the direction of CO2- U

   (a)Force (b) Current (c)Magnetic field (d)Both a & b

5. Lead through methods referred to as _____ method. CO3- U

   (a) Tech by showing (b) Learning (c) Compliance (d) Artificial intelligence

6. For a robot unit to be considered a functional industrial robot, typically, how many degrees of freedom would the robot have? CO3- U

   (a)three (b) four (c) six (d) eight

7. _____ Kinematics will enable to determine where the Robot's hand will be if all joint variable are known. CO4- U

(a) Forward (b) Reverse (c) Inverse (d) Transformation

8. A sensor used in path determination robot CO4- U

(a) ultrasonic sensor (b) IR sensor (c) proximity sensor Bits (d) echo sensor

9. Which of the following places would be LEAST likely to include operational robots? CO5- U

(a) Warehouse (b) Factory (c) Hospitals (d) Private homes

10. Automation with little human touch is known as CO5- U

(a)Automation (b)Autonomation (c)Semi worker (d)Manual work

PART – B (5 x 2= 10 Marks)

11. Define Robotics. CO1- U

12. Analyze the difference between electronic and pneumatic manipulators. CO2- Ana

13. What is application of machine vision system? CO3- U

14. Distinguish Kinematics and Dynamics. CO4- U

15. Explain about path planning? CO5- U

PART – C (5 x 16= 80 Marks)

16. (a) Briefly describe the Robotic Systems with a neat sketch. CO1- U (16)

Or

(b) Explain in details about the Degree of freedom with a neat sketch. CO1- U (16)

17. (a) Compare hydraulic, pneumatic and electrical drives. Sketch and explain pneumatic actuators. CO2-U (16)

Or

(b) Explain in details about DC PMMC motor and Brushless DC motor with a neat sketch CO2-U (16)

18. (a) Explain about the different stages of machine vision system and its types of illumination systems. CO3-U (16)

Or

(b) Discuss in detail about Proximity sensors and Touch sensors. CO3-U (16)

19.	(a)	Illustrate in detail the forward and inverse problem of manipulator kinematics in robots.	CO4- U	(16)
		Or		
	(b)	Explain about Jacobian in terms of D-H matrices in Robot Kinematics.	CO4- U	(16)
20.	(a)	Discuss in details about Block Diagram of Robot control System & motion control.	CO5- U	(16)
		Or		
	(b)	Explain in details about Force Control with a neat sketch.	CO5- U	(16)