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

Question Paper Code: 59375

B.E./B.Tech. DEGREE EXAMINATION, NOV 2018

Open elective

Civil Engineering

15UEE975 -PRINCIPLES OF ROBOTICS

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

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Drives are also known as_____. CO1- R

   (a) Actuators (b) Controller (c) Sensors (d) Manipulator

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

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

3. Which gear is used to reduce speed? CO2- R

   (a) Bevel gears (b) Rack and Pinion (c) Spur gears (d) Worm gears

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

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

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

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

6. The digital image captured by a H/W device called _____ CO3- R

   (a) Controller (b) Computer (c) Frame grabber (d) Robot

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

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

8. The digital conversion reduces the number of _____ levels used in Machine vision. CO4- R

(a) Gray (b) Binary (c) Bits (d) Color

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

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

10. Tactile array sensor is a _____ CO5- R

(a) Position sensor (b) Force sensor (c) Velocity Sensor (d) Temperature sensor

PART – B (5 x 2= 10 Marks)

11. Classify the types of Robotic arm configurations. CO1- Ana

12. Analyze types of grippers. CO2- Ana

13. Define accuracy. CO3- U

14. Define forward solution in kinematics. CO4- U

15. Outline the diagram for robot control system. CO5- U

PART – C (5 x 16= 80 Marks)

16. (a) Explain in details about the Robotic arm configuration and its types. CO1- U (16)

Or

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

17. (a) Analyze the working principle of DC PMMC motor with a neat sketch. CO2-Ana (16)

Or

(b) Analyze the working principle of Brushless DC Motor with a neat sketch. CO2-Ana (16)

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

Or

(b) Define Sensor and explain about Force and torque sensors. CO3-U (16)

19. (a) Explain about Joint position control in controller Architecture. CO4- U (16)

Or

(b) Explain about Jacobian in terms of D-H matrices in Robot Kinematics. CO4- U (16)

20. (a) Explain in details about the Motion Control and its types. CO5- U (16)

Or

(b) Explain in details about Force Control with a neat sketch. CO5- U (16)