A

Reg. No. :

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) 3 Linear movement   (b) 2 Linear movement

   (c) 1Linear 2 rotational movement   (d) 2rotational movement

2. Ability to position back to a point that was previously taught.   CO1- U

   (a) Accuracy   (b) Repeatability   (c) Precision   (d) None of the above

3. Motors used for electronic actuator drives   CO1- U

   (a) AC servo motors   (b) DC servo motors   (c) Stepper motor   (d) All the above

4. Which Grippers are used to transfer ferrous material   CO1- U

   (a) Magnetic   (b) Adhesive   (c) Mechanical   (d) Vacuum

5. The sensor converts light rays into an electrical signal _____   CO1- U

   (a) Optical sensor   (b) Encoder   (c) Potentiometer   (d) Capacitive sensor

6. Electrical transformer is used to measure the angle of rotation   CO1- U

   (a) LVDT   (b) Encoder   (c) Resolver   (d) Photo electric sensor

7. Robotics is a branch of AI, which is composed of _____   CO1- U
   engineering

   (a) Electrical   (b) Mechanical   (c) Computer   (d) All of the above

8. Which of the following motion command is not used in VAL language?   CO1- U

   (a) MOVE   (b) DEPART   (c) D MOVE   (d) D PART

9. A portable robot that follows along marked long lines on the floor   CO2- U

(a) AGV   (b) Monorail   (c) Hoist   (d) Crane

10 A mono rail is a track consists of a   _____   CO2- U

(a) Single Rail   (b) Beams   (c) Track   (d) All of the above

PART – B (5 x 2= 10 Marks)

11 Describe about robot work envelope.   CO1- U

12 List the types of drive systems used in robotics   CO1- U

13 What are the common imaging device used for robot vision system   CO1- U

14 What is APAS   CO1- U

15 List the various investment costs   CO2- U

PART – C (5 x 16= 80 Marks)

16 (a) Explain with a neat sketch of Selective Compliance Assembly Robot Arm.   CO1-U   (16)

Or

(b) Elaborate the selection criteria and factors in the design of a robot.   CO1-U   (16)

17 (a) Explain with neat sketch of hydraulic actuators in robot with merits and demerits.   CO1-U   (16)

Or

(b) Discuss with neat sketch of robot end effector swinging gripper, internal and external gripper.   CO1-U   (16)

18 (a) Describe the neat sketch and working principle of tactile sensor.   CO1-U   (16)

Or

(b) Describe in detail about the illumination technique of robot vision system.   CO1-U   (16)

19 (a) Determine the translated vector for the given vector to perform a translation by a distance of   CO4-App   (16)
Case (i) V =25i+10j+20k X =25 unit , Y=10 unit , Z= 20unit
    (ii) V =20i+10j+10k X =30 unit , Y=25 unit , Z= 15 unit

Or

(b) Categorize and explain the higher level robot computer languages used in nowadays robot programming   CO4-App   (16)

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20   (a)   Explain in detail with neat sketch of Automated Guided Vehicle AGV   CO2-U   (16)

<div align="center">Or</div>

     (b)   Discuss in detail about EUAC method with robot application.   CO2-U   (16)

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