

QP Code : 6115

(3 hrs)

Total marks : 80

NB:

1. Question No 1 is compulsory. Attempt any THREE from remaining.
2. All questions carry equal marks.
3. Answer to each new question should be started on a fresh page.
4. Figure in brackets on the right hand side indicate full marks.
5. Assume suitable data if necessary.

- Q1) a) What are the four basic robot configurations available commercially. (05)
 b) List and explain the important specifications of an industrial robot. (05)
 c) List all feedback devices used in robots and explain any one. (05)
 d) What are the factors which must be considered while choosing the drive system for robots? (05)
- Q2) a) Explain Electric Actuators system of robots with neat sketch. (10)
 b) Explain with sketches the common imaging device used for robot vision systems? (10)
- Q3) a) Sketch a robot wrist and explain its joint movements in details. (10)
 b) Explain the principle of the following sensors and also mention how they are used in robots.
 (i) Piezo electric sensor
 (ii) Inductive proximity sensor
 (iii) Touch sensor
 (iv) Slip sensor (10)
- Q4) a) Derive the forward and reverse transformation of 2-Degree of freedom and 3-degree of freedom arm. (10)
 b) Describe the types of end effector & gripper mechanisms with simple sketches. (10)
- Q5) a) Explain the various programming methods used in robotics with examples and features of each. (10)
 b) List all Robot applications in manufacturing and explain any ONE. (10)
- Q6) Write Short Notes on following: (any FOUR) (20)
1. Power Transmission system of Robots
 2. Robot Dynamics
 3. Robot task planning
 4. Robotic Cell design
 5. Future of Robotics