

III B.Tech II Semester Supplementary Examinations, April/May 2005
ROBOTICS AND AUTOMATION
(Electronics & Control Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Define the term robot and describe the robot anatomy.
(b) How is dynamic stabilization of robots achieved? Describe briefly.
2. (a) What is the necessity to vary the speed of the drives connected in robot control system? Discuss the various arrangements that can be adopted.
(b) Distinguish between hydraulic drives and electric drives.
3. Explain the following types of Sensors and their applications:
(a) Proximity sensors
(b) Range sensors
4. Why is the accurate control of the manipulator requires precise control of each joint? Analyse the various forces and torques acting on the assuming the gravity of the links is ignored.
5. Describe the following mechanical grippers with the help of neat sketches:
(a) Gear and Rack Actuator
(b) Cam Actuator
(c) Linkage Actuator
(d) Screw Actuator
6. (a) What are the various robot programming languages? Discuss the importance of each.
(b) Briefly explain the hill-climb technique.
7. (a) What are the important applications of robots in non-manufacturing field.
(b) Define work envelope and draw the work envelope for various configurations of robot.
8. (a) What is machine interference? What are the ways in which machine interference occurs?
(b) Briefly discuss the overhead rail system for a mobile robot cell.
