

III B.Tech II Semester Supplementary Examinations, April/May 2006
ROBOTICS AND AUTOMATION
(Electronics & Control Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the major components of robot system. [10]
(b) Discuss the Asimov's laws of robotics and explain significance of each law. [6]
2. What are the basic elements required in electric drives? Discuss the different electric drives used in robot control systems. [16]
3. (a) Explain the principle of machine vision. [6]
(b) What are the various tactile sensors? Discuss them briefly. [10]
4. Draw the configuration of TRR robot and explain the dynamic forces and torques acting on each of link. [16]
5. (a) Explain the various salient points to be considered in manipulator design. [6]
(b) With the help of neat sketch, explain the following grippers: [5+5]
 - i. Magnetic gripper
 - ii. Adhesive gripper
6. (a) Describe the various motion commands used in the robot programming languages. [8]
(b) Discuss the work envelope of four axis PUMA robot. [8]
7. (a) Explain the various applications of robot in the manufacturing field. [8]
(b) What is inverse kinematics problem? Explain solution of inverse kinematics problem? [8]
8. Describe the following types of work cell layouts:
 - (a) Robot-centered work cell [5]
 - (b) In-line Robot work cell [5]
 - (c) Mobile Robot cells. [6]
