

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

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. (a) What are the various generations of robots? Briefly explain the importance of each. [8]
(b) Explain the following terms related to robot: [8]
 - i. Work volume
 - ii. Degree of freedom
 - iii. Resolution
 - iv. Dynamic stabilization.
2. Explain the working principle of pneumatic drives. Discuss their advantages, disadvantages and limitations over hydraulic drives. [16]
3. Explain the principle, working and advantages of the following sensors. [8+8]
 - (a) Magnetic sensors.
 - (b) Fibre optic sensors.
4. Discuss the following types of motion that a robot manipulator can make a travelling from point to point: [6+5+5]
 - (a) Skew motion.
 - (b) Joint interpolated motion.
 - (c) Straight line motion.
5. Sketch any four types of grippers and explain their principle, advantages and limitations. [16]
6. (a) Discuss the characteristics of inverse kinematics problem. [8]
(b) Explain the Teach and playback method to communicate with the robot. [8]
7. What are the important factors to be considered in work cell design? Discuss the different types of work cell layouts. [16]
8. Explain the applications of robot in manufacturing and non-manufacturing fields. [16]
