Code No: OR411154 **OR**

IV B.Tech I Semester Supplementary Examinations, April/May 2005
ROBOTICS & AUTOMATION
(Bio-Medical Engineering)

Time: 3 hours **Max Marks: 70**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Define the following terms with reference to Robots.
   i. Work envelope
   ii. Work cell
   iii. degree of freedom
   (b) Classify Robots illustrating their characteristics and applications.
2. (a) Distinguish between 'accuracy' 'resolution' and 'repeatability'. Specify the same for various types of Robots.
   (b) State and explain Asimov's Laws.
3. (a) Discuss principle working of acoustic sensors. Mention its limitations and specific applications.
   (b) Explain the following sensors used in robots.
   i. Magnetic sensor
   ii. Proximity sensor
4. (a) Distinguish between Electrical, Hydraulic and pneumatic actuators.
   (b) With the help pf line sketch explain hydraulic circuit of actuator.
5. (a) Discuss various types of Grippers used in Robots. Also explain their special applications and limitations.
   (b) Discuss design considerations to be considered for Robot grippers.
6. (a) Discuss any five non manufacturing applications of Robot.
   (b) Explain the hill climbing techniques.
7. Discuss with an illustrative example for any one type of Robot, solution for inverse kinematics problem of Robot. Discuss algorithm to be deployed for solving multiple solutions.
8. Write short notes on the following:
   (a) Robot languages.
   (b) Locomotion devices
   (c) Robot cell design.

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