Code : R7411306

R07

IV B.Tech I Semester (R07) Supplementary Examinations, May 2012

ROBOTICS AND AUTOMATION

(Electronics & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE questions

All questions carry equal marks

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1. (a) Explain the various components of a robot system with the help of schematic diagram.
   (b) Briefly explain present and future applications of robotics.

2. (a) Explain about (i) pneumatic drive. (ii) electric drive.
   (b) With a neat block diagram explain the components of machine vision system.

3. (a) Explain the construction of robot manipulator.
   (b) Write a short note on pneumatic manipulator.

4. Write the forward and backward recursive Newton – Euler equations of motion.

5. (a) Compare pneumatic actuators with hydraulic actuators.
   (b) With a neat diagram explain magnetic grippers.

6. (a) Explain reverse transformation of the 2 –degree of freedom arm.
   (b) A jointed arm robot of configuration VVR is to move all three axes so that the first joint is rotated through 50^0, the second joint is rotated through 90^0, and the third joint is rotated through 25^0. Maximum speed of any of these rotational joints is 10^0/s.
   (i) Determine the time required to move each joint if slew motion is used.
   (ii) Determine the time required to move the arm to the desired position and the rotational velocity of each joint, if joint – interpolated motion is used.

7. (a) Write the general considerations on trajectory planning.
   (b) With a neat block diagram explain robot language structure.

8. (a) Write short notes on multiple robots.
   (b) Explain the applications of robots in manufacturing side.

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