

Code No: G0401/R13

M. Tech. I Semester Supplementary Examinations, December-2016

**INDUSTRIAL ROBOTICS**

(Common to AM&amp;MSD, CAD/CAM and AMS)

Time: 3 hours

Max. Marks: 60

*Answer any FIVE Questions*  
*All Questions Carry Equal Marks*

1. Describe the function of actuator in robots also explain various actuators used in robotics 12M
2. a Explain D-H Notation with suitable example. 6M  
 b What are homogeneous transformations in Robot kinematics? For a vector  $20\mathbf{i} + 25\mathbf{j} + 10\mathbf{k}$ , perform a translation by a distance of 8 in x direction, 7 in y direction and 0 in z direction 6M
3. Write a VAL robot program to perform pick and place operation on the conveyer system. it consist of two conveyors running parallel with centre distance of 600 mm at same level. An industrial robot is fixed centrally between the conveyors. The robot is used to transfer work pieces from conveyor 1 to 2 at a constant speed. Draw a schematic view of the system .assume all necessary dimension. 12M
4. a Describe with block diagram the control system components for one joint of a Robot manipulator 6M  
 b End effectors design is very important in robot explain the statement, state various types of grippers used in robotics system and explain any one of them. 6M
5. a Explain the Inline robot cell with the help of neat sketch 6M  
 b Write down design consideration for robot workcell 6M
6. a With neat sketch, explain the working of a stepper motor. 6M  
 b With suitable illustration explain working on external and internal grippers. 6M
7. Explain the segmentation methods used in vision system with suitable example. 12M
8. Explain with neat sketch the application of robot in
  - a) die casting 4M
  - b) grinding operation 4M
  - c) stamping press operation 4M

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