BE | ETRX | VIII (Rev) 19/5/2012
Robotics & Automation

Con. 3833-12. (REVISED COURSE) GN- 7550

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any four questions of remaining six questions.
(3) Assume suitable data wherever necessary.

1) (a)What is fixed and flexible automation 5
(b)Define Kinematic Parameter with the help of suitable diagram. 10
(c)Give any 3 points ,why Inverse Kinematics is Unique ? 5

2) (a)Describe DH algorithm for a 3 DOF articulated Robot .Show all the steps with reference to the figure . 12
(b)Compare and Contrast Direct Kinematics and Inverse Kinematics . 8

3) (a)Find the TCV W(q) for 4-axis cylindrical coordinate robot 12
(b)Define DWE of any robot arm .Explain with their formula 8

4) (a) What is template matching technique of a gray level image and their application to robot vision. 12
(b)What are the moments of an image ?How are the moments use in the shape analysis of objects 8

5) (a)The coordinates of the point 'P' on the body are given by $\{1,2,3\}^T$ 15
Rotate the body about the z-axis by 30^0 and then about the y-axis by 30^0.
Find the new coordinates of the point 'p' w.r.t the fixed frame.
(b)Compare area and Stroke of a Robot, 5

6) (a)Write a PLC ladder logic programme for 4 junction traffic light. 12
(b)Explain the composite rotation matrix (CRM) algorithm. 8

7) (a) Explain PNP motion trajectory in detail . 15
(b)Explain the different types of communication ports used in PLC. 5