Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No.....

MMPD-204

M.E./M.Tech. II Semester

Examination, June 2017

Robotics and Automated Material Handling

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Explain in brief the methods of positioning of robot.
   b) Discuss those factors of workplace layout and design that can contribute to the operator safety?

2. a) The co-ordinates of point P in a frame are $[3.0 \ 2.0 \ 1.0]^T$. The position vector P is rotated about Z-axis by 45°. Find the co-ordinates of point Q, the new position of point P.
   b) Explain the homogeneous transformation matrix with suitable example.

3. a) Explain in brief the various types of adaptive controls used to control the motion of robot.
   b) Define with the aid of neat sketch, the terms pitch, Roll and Yaw in the context of end effectors motions.

4. a) What do you understand by the term algorithm? Explain in context of robot.
   b) What are the different methods of robot programming discuss? Discuss the power lead through and manual lead through methods.

5. a) Explain in brief various non contact types of sensor.
   b) What is machine vision? Discuss the various components of vision system.

6. a) Discuss in brief the carousel storage system. What are the benefits of using this system.
   b) Discuss the ways to assess the performance of a storage system.

7. a) Discuss the various term used for robot performance and its characteristics.
   b) Explain the different types of drives used for controlling the robot with their advantages and disadvantages.

8. Write short note on:
   a) SCARA configuration
   b) Gripper design
   c) AGV

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