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

Roll No..............................

MMCM-204(Old)

M.E./M.Tech. II Semester

Examination, December 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) What are the laws of robotics? Explain in brief.

   b) Write down the difference between the serial and parallel robots.

2. a) What is the need of coordinate frames and transformations?

   b) 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.

3. a) Explain the principle of operation of pneumatic grippers.

   b) Explain in brief the various task carried out by the robot controller.

4. a) What are the types of the off-line programming? What are the features of off-line programming environment should have?

   b) What are the advantages and disadvantages of online programming?

5. a) Explain the classification of robot sensors.

   b) What is optical encoder? Discuss in brief.

6. a) What are the functions automated guided vehicles has to serve?

   b) What do you understand by the term Carousel storage system? Explain in brief.

7. a) Discuss the forces opposing the development of robotics.

   b) Explain the various robot configurations.

8. Write short notes on:

   a) End effectors

   b) AS/RS system

   c) Machine vision

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