Printed pages: 01 **Sub Code: MTEE033**

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M. TECH.
(SEM -II) THEORY EXAMINATION 2018-19
ROBOTICS

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt *all* questions in brief.** **2 x 7 = 14**
   - **a.** Define base and tool coordinate systems.
   - **b.** List any two important advantages and disadvantages of a pneumatic gripper.
   - **c.** What is function frame grabber?
   - **d.** What are the applications of machine vision system?
   - **e.** What is inverse kinematics?
   - **f.** List out the few robot applications area in manufacturing.
   - **g.** Explain any two commands associated with the programming of end effectors.

SECTION B

2. **Attempt any *three* of the following:** **7 x 3 = 21**
   - **a.** Differentiate joint coordinates and world coordinates.
   - **b.** Discuss about Vacuum Grippers along with their advantages and disadvantages.
   - **c.** What are the common types of motion that a robot manipulator can make in travelling from point to point?
   - **d.** List out different robot programming languages.
   - **e.** Discuss the kinematic problems related to a robot system. Also describe end effectors and gripper systems.

SECTION C

3. **Attempt any *one* part of the following:** **7 x 1 = 7**
   - **a.** What do you mean by robotics? Also explain the law of robotics.
   - **b.** Describe the classification of robots by control system.
4. **Attempt any *one* part of the following:** **7 x 1 = 7**
   - **a.** Discuss in detail about Magnetic gripper with neat sketch.
   - **b.** Discuss in detail factors considered while selection and design of grippers.
5. **Attempt any *one* part of the following:** **7 x 1 = 7**
   - **a.** Write short notes on: (i) Adaptive control in robot (ii) Position and path in robot.
   - **b.** For the point [3 7 5] perform the following operations:
     - i. Rotate 300^0 about X-axis
     - ii. Translate 8 units along y-axis
6. **Attempt any *one* part of the following:** **7 x 1 = 7**
   - **a.** Explain any four types of robot programming. Discuss the important requirement of programming languages.
   - **b.** Briefly explain the working principle of any two types of position sensors with neat sketch.
7. **Attempt any *one* part of the following:** **7 x 1 = 7**
   - **a.** Explain vacuum grippers, with reference to the principle, use and applications.
   - **b.** Describe the Spray coating operation with robot system.

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