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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° 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.