2112E085

BACHELOR OF VOCATION

Robotics and Automation

Subject: Fundamental of Robotic System

Subject Code: RA-501

Semester: First

December 2021

Theory (External): 35 Marks

Time: 03 Hours

Instructions to the Students

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number											

SECTION –A (SHORT/OBJECTIVE TYPE QUESTIONS)
(10x1=10 Marks)

A. Define the term kinematics with respect to robotics.

B. Define the term joint offset and joint angles.

C. List different types of end effectors.

D. Are minimum joints in a universal robot?

E. What is robot programming language?

F. What are different types of rotary joints notations?

G. What are benefits of industrial robots?

H. Define pitch, yaw and role.

I. What are three degrees of freedom associated with the arm and body motion?

J. What is work space?

SECTION –B (ESSAY TYPE QUESTIONS)
(5x5=25 Marks)

1. Analyse the gripper force to be used in various linkage mechanisms. How the grippers are selected based on the applications.

2. How the correct accuracy, repeatability and resolution enhance the properties performed by a robot.

3. Determine the rotation matrix that represents a rotation of 60° about OZ axis, followed by rotation of 30° about OY axis, followed by rotation of 45° about OX axis.

4. How do we calculate maximum tractive force in robot drive system. List the factors on which friction coefficient depends.

5. State the principle adopted in vacuum cup gripper and its applications.

6. Explain three different drive systems in detail.

7. Write a note on importance of path planning in autonomous mobile robots.

8. "A drive system can also be used to determine the capacity of a robot". Comment?

==END OF PAPER==