

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3171717**Date:01-12-2023****Subject Name: Robotic Engineering****Time: 10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) State three laws of robotics. **03**
 (b) Explain various part of a robot with neat sketch. **04**
 (c) Explain the working of DC servo motor used in robotics **07**
- Q.2** (a) List types of robot joints alongwith notation, symbol and description. **03**
 (b) Sketch a robot wrist and explain its joint movements. **04**
 (c) Describe the rotation matrix in detail. **07**
- OR**
- (c) List out various configurations of robot. Explain any one in detail. **07**
- Q.3** (a) Explain degree of freedom with example. **03**
 (b) What is kinematics? Explain its types. **04**
 (c) What is robot programming? Explain various types of robot programming. **07**
- OR**
- Q.3** (a) What is a robotic cell? What is its purpose? **03**
 (b) Differentiate between path planning and trajectory planning. **04**
 (c) Explain in detail various types of grippers in robotics. **07**
- Q.4** (a) What are the parameters to be considered while selecting a sensor **03**
 (b) Explain how to decide HP rating of a motor. **04**
 (c) Explain the working of any two proximity sensors. **07**
- OR**
- Q.4** (a) What is work envelope? Explain with example. **03**
 (b) What is tactile sensor? How can it be used in robotic hand? **04**
 (c) Explain various robotic cell layouts. **07**
- Q.5** (a) What is the significance of machine vision in robotics? **03**
 (b) Explain the working of range sensors **04**
 (c) Explain the function of robots in spot welding. **07**
- OR**
- Q.5** (a) List out gripper design considerations. **03**
 (b) Compare between electric and pneumatic actuators. **04**
 (c) Explain arc welding using robot. State its advantages. **07**
