

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2181919

Date: 19/11/2018

Subject Name: Robotics

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1**
- (a) Brief today's commercially available basic configuration of robot. **03**
 - (b) Explain tactile sensor working with its applications. **04**
 - (c) Discuss in brief applications of robotics. What will be its future applications in the field of Robotics? **07**
- Q.2**
- (a) Brief out PID Control System. **03**
 - (b) Explain with neat sketch Roll-Pitch-Yaw angles in terms of Robotics. **04**
 - (c) Explain Open loop control system. **07**
- OR**
- Q.3**
- (c) Discuss in detail GANTRY type robots. **07**
 - (a) Explain in brief types of motion control systems. **03**
 - (b) What are the applications of machine vision in robotics? **04**
 - (c) Describe principle function of robot vision system. **07**
- OR**
- Q.3**
- (a) What are the main components used in Robots. **03**
 - (b) Describe various terminology of trajectory planning in brief. **04**
 - (c) What are the General consideration in Robot Material Handling? **07**
- Q.4**
- (a) Discuss the different types of Robotic gripper **03**
 - (b) Explain Manipulator Jacobian. **04**
 - (c) Write a short note on robot kinematics. **07**
- OR**
- Q.4**
- (a) Briefly discuss 'Degree of freedom' with neat sketch. **03**
 - (b) Give comparison of Lagrange – Euler and Newton – Euler formulations. **04**
 - (c) Explain following terms for robotic sensors: **07**
(1) Limit switches (2) potentiometers
- Q.5**
- (a) Describe in brief about artificial intelligence in terms of Robotics. **03**
 - (b) Draw and Explain feed forward and feedback control loops **04**
 - (c) Define Robot anatomy. Explain Spherical configuration of robot and its work envelope. **07**
- OR**
- Q.5**
- (a) Discuss the properties of Robotic sensors. **03**
 - (b) Explain Gripper design consideration in robotics. **04**
 - (c) Using D-H representation derive the matrix for Cylindrical configuration of robot. **07**