Seat No.: _____ Enrolment No.

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	
	(c)	Discuss in detail GANTRY type robots.	**07**
Q.3	**(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: (1) Limit switches (2) potentiometers	**07**
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**