Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – SUMMER 2015

Subject Code: 172005 **Date:06/05/2015**

Subject Name: Robotics

Time: 02:30 to 05:00 **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)**	Discuss the advantage and disadvantage of using robots in industry.	**07**
	(b)	Briefly discuss the various types of robots components	**07**
Q.2	**(a)**	Explain the open loop and closed loop control system in robots.	**07**
	(b)	Briefly discuss the PID control system in robots.	**07**
		OR	
	(b)	What is the primary difference between a servo and non-servo robot system?	**07**
Q.3	**(a)**	Difference between SCARA robots and GANTRY robots.	**07**
	(b)	Define a robot and with a diagram explain the anatomy of a robot.	**07**
		OR	
Q.3	**(a)**	Write the D-H notation for robots and define homogeneous transformation matrix.	**07**
	(b)	Difference between forward kinematics and inverse kinematics.	**07**
Q.4	**(a)**	Give the classification of sensors used in robots with example.	**07**
	(b)	Describe the principle function of robot vision system.	**07**
		OR	
Q.4	**(a)**	Explain with neat sketch the optical proximity sensors.	**07**
	(b)	Explains the following term in robotics sensor. 1. Encoders 2. Limit switches 3. Potentiometer	**07**
Q.5	**(a)**	Discuss the capacitive sensing and laser sensing.	**07**
	(b)	Explain the types of touch sensors with neat sketches.	**07**
		OR	
Q.5	**(a)**	Explain the two different types of programing method in robotics.	**07**
	(b)	Discuss the gripper design considerations in robotics.	**07**

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