Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2160808 **Date: 08/05/2017**

Subject Name: Robotics Programming and Applications

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.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Define Spatial resolution	
	2	Define Accuracy	
	3	Define Repeatability	
	4	Define Compliance	
	5	Classify robot languages.	
	6	Function of Sensor	
	7	Write Langrange-Euler formula	
	8	Types of motors.	
	9	What is end effector?	
	10	Define Payload	
	11	Define Precision	
	12	What is a mechanical gripper?	
	13	What is LVDT?	
	14	What is inverse kinematics?	
Q.2	**(a)**	Explain specification of Robots	**03**
	(b)	Explain 'Roll, Pitch & Yaw (RPY)' angle configuration.	**04**
	(c)	Explain Different Robot Configurations with Figure.	**07**
		OR	
	(c)	Explain with Example "Forward and Inverse kinematics".	**07**
Q.3	**(a)**	Discuss in details on different commands used in robot programming.	**03**
	(b)	Explain different types of joints in robots.	**04**
	(c)	Write short note on – "Proximity and range sensors".	**07**
		OR	
Q.3	**(a)**	Explain "Stepper Motor" in Control System.	**03**
	(b)	Explain "Different types of Gripper Mechanisms	**04**
	(c)	Comparision between hydraulic and pneumatic actuator	**07**
Q.4	**(a)**	Explain 'robot language structure'.	**03**
	(b)	Explain Desirable Features of Sensors.	**04**
	(c)	Discuss advantages and disadvantages of Cartesian robots over other geometric configuration of robots.	**07**
		OR	
Q.4	**(a)**	Explain AL and AML robot programming language.	**03**
	(b)	Explain Tactile Sensors.	**04**
	(c)	Explain Robot Application in "Material Transfer & Machine Loading /Un Loading System".	**07**
Q.5	**(a)**	Explain application of robot in Spray coating operation.	**03**
	(b)	Discuss general considerations in robot material handling.	**04**
	(c)	Enlist different types of drives used in robotic system. Explain each in detail.	**07**

OR

Q.5	**(a)**	Write a short note on hydraulic motors.	**03**
	(b)	Describe image processing and analysis in detail for robotic vision system.	**04**
	(c)	Explain D'Alemberteuation of motion.	**07**

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