

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2181706

Date:09/05/2019

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.

		Marks
Q.1	(a) Explain forward kinematics.	03
	(b) Write a short note on inverse kinematic	04
	(c) Explain D-H parameter.	07
Q.2	(a) Explain Vacuum gripper.	03
	(b) State and define various components of robots	04
	(c) Explain the construction of LVDT used in robotics for displacement measurement.	07
OR		
	(c) Spot welding	07
Q.3	(a) State Asimov's Law of Robotics	03
	(b) Explain magnetic grippers. State its advantages.	04
	(c) Explain any one electric drive system for robot.	07
OR		
Q.3	(a) Explain degree of freedom with suitable example.	03
	(b) Explain mechanical gripper.	04
	(c) Comparison between hydraulic and pneumatic actuator. Explain any one	07
Q.4	(a) Explain the working principal of Time of Flight range sensor.	03
	(b) Explain Any two robotic cell layouts.	04
	(c) What is robot programming? Explain in detail various types of robot Programming	07
OR		
Q.4	(a) What is a Tactile Sensor?	03
	(b) Explain the origin and history of Robotics in detail.	04
	(c) Explain working of external and internal grippers with suitable illustration.	07
Q.5	(a) Write a short note on force and torque sensor	03
	(b) What is full form of SCARA? Explain SCARA.	04
	(c) The coordinates of a point $P_{abc}=(4,3,2)^T$ in the body coordinates frame oabc are rotated through 45° about OZ axis. Determine the coordinates of the vector P_{xyz} with respect to base reference coordinate frame.	07
OR		
Q.5	(a) What is machine interference?	03
	(b) Explain the use of optical sensors in robots	04
	(c) Spray painting	07
