GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3171717   **Date:14/06/2022**

Subject Name:Robotic Engineering

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Explain working on external and internal grippers with suitable illustration.	**03**
	(b)	Explain the various parts of a robot with neat sketch.	**04**
	(c)	Explain the working of DC Servo motor used in robotics.	**07**
Q.2	**(a)**	Sketch a robot wrist and explain it's the joint movements.	**03**
	(b)	Define degree of freedom, robot, repeatability and links.	**04**
	(c)	Explain in detail history of robotics, along with various generations of robots that came into existence.	**07**
		OR	
	(c)	What are the four basic robot configurations available commercially?	**07**
Q.3	**(a)**	What is work volume? What is meant by Work space?	**03**
	(b)	Differentiate between path planning and trajectory planning.	**04**
	(c)	Explain in detail the method used for solving inverse kinematic problem.	**07**
		OR	
Q.3	**(a)**	What are the factors to be considered while selecting the robot?	**03**
	(b)	Why servomotors are preferred with stepper motor in robot applications?	**04**
	(c)	What are the factors which must be considered while choosing the drive system for robots?	**07**
Q.4	**(a)**	List out the gripper design considerations?	**03**
	(b)	Explain Proximity Sensor.	**04**
	(c)	Explain vacuum grippers, with reference to the principle and applications.	**07**
		OR	
Q.4	**(a)**	What is the purpose of using machine vision in robots?	**03**
	(b)	Explain the use of tactile sensors in robots.	**04**
	(c)	List out various sensors which can be interfaced with robots. Explain any one sensor interface with robot in detail.	**07**
Q.5	**(a)**	List any 3 types of arms used in industrial robot manipulators.	**03**
	(b)	Explain how to decide the HP rating of a motor?	**04**
	(c)	State the features of 'Hydraulic and Pneumatic actuators' system with neat sketch.	**07**

OR

Q.5	**(a)**	Explain in detail robot cell.	**03**
	(b)	Explain work envelope with necessary example and figure.	**04**
	(c)	What is robot programming? Explain in detail various types of robot programming.	**07**

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