GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3164208   **Date:24-05-2024**

Subject Name:Introduction to Robotics

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

Q.1	**(a)**	Explain work volume, Accuracy, Repeatability, Dexterity	**03**
	(b)	Explain Robot anatomy with figure	**04**
	(c)	Explain four basic configuration according to work envelope and applications.	**07**
Q.2	**(a)**	What is sensor? List various sensors used in robotic system	**03**
	(b)	Enumerate function of actuator. Explain any one with neat sketch.	**04**
	(c)	Classify various types of grippers and describe vaccume type gripper.	**07**
		OR	
	(c)	Which are the consideration are to be consider for selection of gripper.	**07**
Q.3	**(a)**	How the sensors are selected?	**03**
	(b)	Explain with neat sketch force torque sensors.	**04**
	(c)	Explain resolution, sensitivity, range, reliability ,response time for sensor	**07**
		OR	
Q.3	**(a)**	Explain importance of machine vision	**03**
	(b)	Write short note on Image Processing	**04**
	(c)	Explain Accoustic and Pnematic Sensors	**07**
Q.4	**(a)**	Enlist drives used in robotics	**03**
	(b)	What is controller? Explain PID Controller	**04**
	(c)	What is forward kinematics? How it helps in robotics?	**07**
		OR	
Q.4	**(a)**	Enlist parts of mobile robot.	**03**
	(b)	What is inverse dynamics in robot?	**04**
	(c)	Enlist controller used in robotics? Explain pneumatic controller.	**07**
Q.5	**(a)**	Explain WAIT, SIGNAL , DELAY command	**03**
	(b)	Explain VAL , RAIL command	**04**
	(c)	Discuss need of AI in Robotics and explain any one method in AI.	**07**
		OR	
Q.5	**(a)**	Discuss about generation of robotic languages	**03**
	(b)	Discuss trends and application of AI	**04**
	(c)	Enlist programming method and explain AML, Python, ROS	**07**

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