Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(New course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 2725001 **Date: 09/12/2015**

Subject Name: Robotics and Artificial Intelligence

Time:2:30 pm to 5:00 pm **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)**	Explain the different applications of AI in manufacturing and the use of different software in AI.	**07**
	(b)	Explain the various types of gripper mechanism with neat sketch.	**07**
Q.2	**(a)**	Explain the following terminologies in regard to robotics: (1) Control Resolution, (2) Repeatability, (3) Cycle Time, (4) Degree of freedom, (5) Pay Load, (6) Work envelope, (7) Speed of response	**07**
	(b)	What do you mean by robot configuration? Explain 2P, 2PR, and 3Rconfiguration.	**07**
		OR	
	(b)	Discuss the factors of consideration while selecting the gripper for the robot.	**07**
Q.3	**(a)**	Define Automation. List out all the types of Automation and Explain them in detail by giving the industrial applications of each.	**07**
	(b)	Derive transformation matrix for Euler angles D-H representation of forward kinematics.	**07**
		OR	
Q.3	**(a)**	Enlist the use of sensors in robotics. Also List & Explain the seven Desirable Features of Sensors.	**07**
	(b)	Explain ñRoll,Pitch and Yawò angle configuration for SCARA robot.	**07**
Q.4	**(a)**	Classify the types of the cost. Explain the different cost by taking industrial examples.	**07**
	(b)	Enlist robot cell layouts. Compare ñRobot centered cellò and ñInline robot cellò.	**07**
		OR	
Q.4	**(a)**	What is the Importance of the Interlocks? Explain different types of Interlocks & their uses in detail.	**07**
	(b)	List out & Explain the methods of economic analysis for Robot selection/purchase in detail with industrial examples.	**07**
Q.5	**(a)**	List out the assumptions made for solving AI problems. Compare AI versus Natural Intelligence.	**07**
	(b)	Solve 8-puzzle problem using Depth-First Search.	**07**
		OR	
Q.5	**(a)**	Differentiate the DFS and BFS with merits and demerits.	**07**
	(b)	What is heuristic function? Give & explain the importance of heuristic function by taking a real life application.	**07**

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