Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II– EXAMINATION – WINTER - 2016

Subject Code: 2725001 **Date: 18/11/ 2016**

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 industrial robots and list various application in industries. **07**

Q.2 **(a)** Explain the following terminologies in regard to robotics: **07**
(1) Control Resolution, (2) Repeatability, (3) Cycle Time, (4) Degree of freedom,
(5) Pay Load, (6) Work envelope, (7) Speed of response

(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 D-H representation of given robot configuration FIGURE 1. **07**

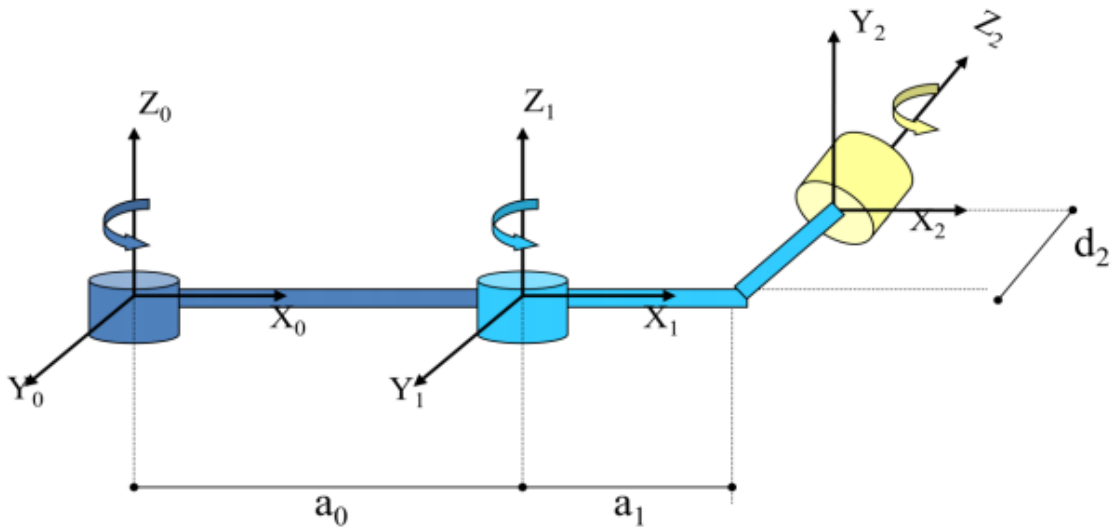

FIGURE 1

OR

Q.3 **(a)** Enlist the use of sensors in robotics. Also List & Explain the seven Desirable Features of Sensors. **07**

(b) Explain the various types of gripper mechanism with neat sketch. **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 “Robot centered cell” and “Inline robot cell”. **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)	Explain what is Fuzzy Logic? Explain the application in the area of controlled Automation.	**07**

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