Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY ME SEMESTER II EXAMINATION – SUMMER 2017

Subject Code: 2725001 Date: 26/05/2017

Subject Name: Robotics and Artificial Intelligence

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

Q.1	(a)	Explain the different applications of AI in manufacturing and the use of different software in AI.	07
	(b)	Explain the various Industrial Applications of Robots. Explain in specific for the following on the shop floor Material transfer, Machine loading/unloading, Processing operation, Assembly and Inspection.	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. OR	07
	(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 "Roll,Pitch and Yaw" angle configuration for PUMA 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 "Robot centered cell" and "Inline robot cell". OR	07
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)	Explain in brief Robot Vision system.	07
	()	OR	
Q.5	(a)	Differentiate the DFS and BFS with merits and demerits.	07
V. .5		What is heuristic function? Give & explain the importance of heuristic function by	07
	(b)	taking a real life application.	U/
