GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020

Subject Code:3151110   **Date:22/01/2021**
Subject Name:Robotics & Automation
Time:10:30 AM TO 12:30 PM   **Total Marks: 56**
Instructions:
1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	State Asimov's Law of Robotics.	**03**
	(b)	Explain the origin and history of Robotics in detail.	**04**
	(c)	Explain Robot Operating System (ROS) in detail.	**07**
Q.2	**(a)**	Explain degree of freedom with suitable example.	**03**
	(b)	State various components/parts of robots.	**04**
	(c)	List out various application in manufacturing where robots are used and explain any one application how robots are applied in detail?	**07**
Q.3	**(a)**	Explain the roll of microprocessors and microcontrollers in Robotics & Automation.	**03**
	(b)	Explain the use of optical sensors in robots.	**04**
	(c)	Explain DC Motors Interfacing with Arduino.	**07**
Q.4	**(a)**	State any 3 sensors which are generally used in robots.	**03**
	(b)	Write a short note on pneumatic actuator.	**04**
	(c)	Explain Stepper Motors Interfacing with Arduino.	**07**
Q.5	**(a)**	Give Classification of Robot Languages.	**03**
	(b)	Write a program to blink the LED connected at Digital I/O Pin 10 of Arduino UNO after 5 Seconds Delay.	**04**
	(c)	What is Raspberry Pi and Why is it good for Robot Programming?	**07**
Q.6	**(a)**	Write a short note on inverse kinematics.	**03**
	(b)	What are the limitations of on-line robot programming?	**04**
	(c)	Explain Arduino platform as robotic controller.	**07**
Q.7	**(a)**	What is machine interference?	**03**
	(b)	Explain the various generations of robots with example.	**04**
	(c)	List types of grippers in robotics and Explain grippers interfacing with robotic controller.	**07**
Q.8	**(a)**	Discuss the advantages and disadvantages of using robots in industry.	**03**
	(b)	Explain Any two robotic cell layouts.	**04**
	(c)	How robots are classified based on coordinate system? Discuss any one of them with the help of neat sketches.	**07**

****