

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
