

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - VI EXAMINATION - WINTER 2025

Subject Code: 3164105

Date: 25-11-2025

Subject Name: Industrial Robotics and Material Handling Systems

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.**
- 4. Simple and non-programmable scientific calculators are allowed.**

	Marks
Q.1 (a) Enlist different types of industrial robots.	03
(b) Write criteria and procedure to calculate handling capacity of load.	04
(c) Explain Robot Centered Cell with suitable example.	07
Q.2 (a) Enlist Software and computer tools used for robotic application.	03
(b) What is robot vision system? Write functions and application of it.	04
(c) Explain depth measurement with suitable example.	07
OR	
(c) By the help of camera and other sensors how the robot can recognize the object and categorize in the form of shape, size, color and weight?	07
Q.3 (a) Write advantages and disadvantages of robot in industry.	03
(b) Explain use of robot in continues spot welding.	04
(c) In assembly line how the robot can recognize the object and separate it? Explain with block diagram. (Take example of sorting by shape or size or color, as per your thought)	07
OR	
(a) Write applications and future scope of robot in industry.	03
(b) Explain use of robot in continues arc welding.	04
(c) If robot is to be designed for underwater application what should be selection process? Explain in detail.	07
Q.4 (a) Write steps for the designing of gripper.	03
(b) How do you test robot performance?	04
(c) Write difference between active gripper and passive gripper. Also write principle, advantages, disadvantages, applications and give examples of both.	07
OR	
(a) Write impact of robot on industry and society.	03

- (b) Write criteria and procedure to analyze required force to operate the gripper. 04
- (c) What do you mean by degree of freedom? Write all types of degree of freedom and explain each with suitable example. 07
- Q.5** (a) Write a principle and application of material handling system 03
- (b) Discuss barcode technology with suitable example. 04
- (c) Explain conveyor system with example. 07
- OR**
- (a) Write advantages of advanced material handling system over conventional material handling system. 03
- (b) What is full form of RFID? Discuss this technology with suitable example. 04
- (c) Explain automated guided vehicle system. 07
