

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI EXAMINATION – SUMMER 2025****Subject Code: 3164105****Date: 30-05-2025****Subject Name: Industrial Robotics and Material Handling Systems****Time: 10:30 AM TO 01:00 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**

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|------------|--|-----------|
| <b>Q.1</b> | <b>(a)</b> Give the brief classification of Robot.   | <b>03</b> |
|            | <b>(b)</b> What are general considerations in Robotic material handling?   | <b>04</b> |
|            | <b>(c)</b> How the robots are used in material loading and unloading purpose and for material transfer in automobile industry? | <b>07</b> |
| <b>Q.2</b> | <b>(a)</b> What do you understand by the term ‘Robot vision’?  | <b>03</b> |
|            | <b>(b)</b> What are the functions of robotic vision system and application?  | <b>04</b> |
|            | <b>(c)</b> List various software consideration for using the robots for inspection.  | <b>07</b> |
|            | <b>OR</b>  |           |
|            | <b>(c)</b> Explain image data compression with suitable example.   | <b>07</b> |
| <b>Q.3</b> | <b>(a)</b> Enlist application of robots in industries.   | <b>03</b> |
|            | <b>(b)</b> Explain use of robot in Spray painting.   | <b>04</b> |
|            | <b>(c)</b> Discuss the process of selection and design of a robot for an assembly line of an automobile industry.              | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.3</b> | <b>(a)</b> List the disadvantages of applying robots in industrial applications.   | <b>03</b> |
|            | <b>(b)</b> Explain use of robot in Cleaning operation.   | <b>04</b> |
|            | <b>(c)</b> Discuss the process of selection and design of a robot for Underwater applications.                                 | <b>07</b> |
| <b>Q.4</b> | <b>(a)</b> What is the Impact of robot on society?   | <b>03</b> |
|            | <b>(b)</b> State the factors influencing the choice of a robot in medical applications.  | <b>04</b> |
|            | <b>(c)</b> Differentiate: active and passive grippers with suitable example.   | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.4</b> | <b>(a)</b> Discuss the economics of robotisation.  | <b>03</b> |
|            | <b>(b)</b> State the factors influencing the choice of a robot in Food processing industry.                                    | <b>04</b> |
|            | <b>(c)</b> Explain working on external and internal grippers with suitable illustration.                                       | <b>07</b> |
| <b>Q.5</b> | <b>(a)</b> Explain objectives of material handling.  | <b>03</b> |
|            | <b>(b)</b> Which are advanced material handling systems available? Give suitable example.                                      | <b>04</b> |
|            | <b>(c)</b> At which particular situation automated guided vehicle system is used? Explain with suitable example.               | <b>07</b> |
|            | <b>OR</b>  |           |
| <b>Q.5</b> | <b>(a)</b> Give the applications of monorails.   | <b>03</b> |
|            | <b>(b)</b> Classify the conveyors along with its application.  | <b>04</b> |
|            | <b>(c)</b> Explain with suitable example: Use of automated storage and retrieval systems in any industry.                      | <b>07</b> |

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