

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3171508****Date:06-12-2023****Subject Name: Factory Automation****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.

- Q.1 (a)** Explain three basic elements of Automation. **03**
- (b)** What is Automates? What are the reasons why companies automate their operations? **04**
- (c)** Explain the opportunities for Automation and Computerization in Manufacturing system. **07**

- Q.2 (a)** What are the Levels of Automation? Explain in brief. **03**
- (b)** What is transfer Line? Explain the merits and demerits of Transfer machines. **04**
- (c)** Explain the types of Automation relative to types of Production Quantity and Product Variety. **07**

OR

- (c)** Explain : 10 Strategies for Automation and Process Improvement **07**
- Q.3 (a)** Explain the term: (i) Utilizing Equipment (ii) Unit load Principle **03**
- (b)** Discuss: **04**
- (i) Fixed-Aisle Automated Storage/Retrieval Systems
- (ii) Carousel Storage Systems
- (c)** What are the different considerations made while designing material handling equipment? Discuss in brief. **07**

OR

- Q.3 (a)** Name three categories of automated guided vehicles. Explain each in brief. **03**
- (b)** What are the three principal components in automatic identification technologies? Explain in Brief. **04**
- (c)** What are the five categories of material transport equipment commonly used to move parts and materials inside a facility? **07**
- Q.4 (a)** What are the three capabilities that a manufacturing system must possess in order to be flexible? **03**
- (b)** What is the difference between a hierarchical structure and a chain-type structure in a classification and coding scheme? Explain with suitable example. **04**

- (c) Discuss in Brief: 07
 (i) Dedicated FMS
 (ii) Random Order FMS
 (iii) Expansion Flexibility
 (iv) Route Flexibility

OR

- Q.4** (a) Name the four tests of flexibility that a manufacturing system must satisfy in order to be classified as flexible. 03
 (b) What are the three methods for solving the problem of grouping parts into part families? 04
 (c) Discuss in Brief: 07
 (i) Opitz classification and coding system
 (ii) Primary and Secondary handling devices in FMS
 (iii) Production flow analysis
 (iv) Process Flexibility

- Q.5** (a) What are the two basic types of control charts? 03
 (b) Discuss the differences between the traditional view of quality control and the modern view. 04
 (c) What is the difference between an event-driven change and a time-driven change in discrete control 07

OR

- Q.5** (a) What is direct digital control (DDC), and why is it no longer used in industrial process control applications? 03
 (b) Explain supervisory control and data acquisition 04
 (c) Distinguish between continuous v/s Discrete control system with example. 07
