

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3171922****Date:06-12-2023****Subject Name: Automation in Manufacturing****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) What is the USA Principle? What does each of the letters stand for? **03**  
(b) List out the various Reasons for automation. **04**  
(c) What is automation? Explain types of automation. **07**

- Q.2** (a) List out various applications of group technology. **03**  
(b) Explain cellular manufacturing system. **04**  
(c) Explain OPTIZ parts classification and coding system. **07**

**OR**

- (c) Describe rank order clustering technique in automation. **07**  
**Q.3** (a) Explain the basic components of flexible manufacturing system (FMS). **03**  
(b) Describe material storage system. **04**  
(c) Explain automated guided vehicles (AGVS) associated with FMS. **07**

**OR**

- Q.3** (a) List out applications and advantages of flexible manufacturing system (FMS). **03**  
(b) Explain the different applications of pneumatic and hydraulic system used in Automation. **04**  
(c) List out various types of rotary actuators and explain any two in brief. **07**  
**Q.4** (a) Differentiate between End Effectors and Manipulators used in robot. **03**  
(b) Explain the advantages, limitations and applications of robot. **04**  
(c) Write short note on hydraulic system components. **07**

**OR**

- Q.4** (a) Define following terms: **03**  
Transducers, Sensors and Actuators.  
(b) Write a short note on coordinate measuring machine. (CMM) **04**  
(c) Describe functions, working and limitations of automated transfer machine. **07**  
**Q.5** (a) What is modular automation? **03**  
(b) Illustrate auto-storage and auto-retrieval system. **04**  
(c) Explore scope of automation in Indian industries. **07**

**OR**

- Q.5** (a) How automation affects on economy? **03**  
(b) Write a short note on automated material handling system. **04**  
(c) Write a short note on casting shop design in modular automation. **07**

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