

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VII EXAMINATION-SUMMER 2023****Subject Code: 3171922****Date: 23/06/2023****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.

		MARKS
Q.1	(a) What is automation? Explain different types of Automations.	03
	(b) Enlist and explain different elements of a robot system.	04
	(c) Explain USA Principle for automated manufacturing system and also explain different strategies for automation and process improvement.	07
Q.2	(a) Define group technology along with list of different attribute require to group different parts together.	03
	(b) Explain different types of automated storage and retrieval systems with reasons leads to use it.	04
	(c) List out different systems use to assign the codes and briefly elaborate all the features of OPITZ system with suitable example.	07
OR		
	(c) Explain with example basic code structures used in parts classification and coding system for group technology applications.	07
Q.3	(a) Define machine flexibility and product flexibilities. What are the factors on which they depend?	03
	(b) Briefly describe the features of an automatic tool change systems in turning centers used to establish flexible manufacturing system.	04
	(c) Explain needs of flexible manufacturing system and briefly elaborate different components commonly used to structure FMS.	07
OR		
Q.3	(a) List different flexibilities associated with Flexible Manufacturing System and explain volume flexibility and expansion flexibility in brief.	03
	(b) Elaborate comparison of flexible manufacturing system with other manufacturing approaches.	04
	(c) Write short note on different types of flexible manufacturing system with their unique features.	07

- Q.4** (a) What is actuator? Enlist different hydraulic actuators with it's functions. **03**
(b) In automated material handling system what is automated guided vehicle systems and discuss any one type of automated guided vehicle systems. **04**
(c) With concrete example explain different application of pneumatics system in automation **07**

OR

- Q.4** (a) Enlist limitations of pneumatics and hydraulic system for automation. **03**
(b) Write short notes: Automated guided vehicle systems guidance control. **04**
(c) Explain different application of hydraulic system in automation **07**
- Q.5** (a) Explain in context of Group Technology (i) Coding structures (ii) Composite part. **03**
(b) With concrete example explain the feasibility and effect of automation focusing on economical point. **04**
(c) Briefly explain parameters needs to consider for robot specification and selection. **07**

OR

- Q.5** (a) List out different configurations available for industrial robots. Explain polar coordinate configuration. **03**
(b) With suitable example explain breakeven point analysis for automation also explains scope of automation in Indian industries. **04**
(c) What do you mean by precision & accuracy in context of robotics? Explain with neat sketch. State various applications of robots. **07**
