

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024****Subject Code:3161917****Date:12-12-2024****Subject Name: Computer Aided Manufacturing****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.

- Q.1** (a) Define Computer-Aided Manufacturing (CAM). What are its primary objectives? **03**
 (b) Evaluate the advantages of using PLCs over traditional hardwired control systems in terms of programming flexibility. **04**
 (c) Identify the major components of a CIM system. Analyze the impact of CIM on production planning and control. **07**
- Q.2** (a) Define NC and CNC technology. What are the differences between them? **03**
 (b) Explain the role of sensors and actuators in a CNC system. **04**
 (c) Write a simple part program to perform a drilling operation using a CNC machine. **07**
- OR**
- (c) Explain working of recirculating ball screw. How does a recirculating ball screw contribute to the precision and efficiency of CNC machines? **07**
- Q.3** (a) What is a Flexible Manufacturing System (FMS)? List the key components of an FMS. **03**
 (b) Explain the concept of cellular manufacturing and how it differs from traditional batch production. **04**
 (c) Explain the working principle of AS/RS and how it benefits warehouse operations. **07**
- OR**
- Q.3** (a) List the primary objectives of implementing an FMS. **03**
 (b) Explain the importance of layout design in the efficiency of an FMS. **04**
 (c) Define Automated Guided Vehicles (AGVs). Compare the advantages and disadvantages of AGVs versus traditional material handling methods. **07**
- Q.4** (a) List the main functions of PPC in a manufacturing system. **03**
 (b) Identify the key benefits of implementing Group Technology in manufacturing. **04**
 (c) Define Computer-Aided Process Planning (CAPP). Explain the difference between variant and generative CAPP systems. **07**
- OR**
- Q.4** (a) Explain Enterprise Resource Planning (ERP). **03**
 (b) List the steps involved in the rank order clustering method for cell design. **04**
 (c) Compare the OPITZ and PFA coding systems in terms of complexity and application with suitable example. **07**
- Q.5** (a) Explain the benefits of using robots in manufacturing compared to manual labor. **03**
 (b) Discuss the role of JIT in inventory management and cost reduction. **04**
 (c) Explain various physical configuration of robot with example. **07**
- OR**
- Q.5** (a) Explain the difference between forward kinematics and inverse kinematics in robotic motion planning. **03**
 (b) Describe key components of an expert system. **04**
 (c) Define actuators and transducers in the context of robotics. Describe the role of transducers in robotic sensing and feedback systems. **07**
