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Question Paper Code : 91949

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Seventh Semester

Mechanical Engineering

ME 3792 — COMPUTER INTEGRATED MANUFACTURING

(Common to : Industrial Engineering/Industrial Engineering and Management/Mechanical and Automation Engineering/Mechatronics Engineering/Production Engineering/Robotics and Automation)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define CAD and state its role in manufacturing.
2. What are the main elements of the CIM system?
3. List any two types of conveyors used in automated manufacturing systems.
4. Write the concept of "Automated Guided Vehicle" in material handling.
5. Define "Part family" and its significance in Group Technology.
6. What is the purpose of machine cell design in Flexible Manufacturing Systems (FMS)?
7. Mention the essential activities involved in process planning.
8. Differentiate between manual and computer-aided process planning.
9. Define "Adaptive Control" in the context of process control systems.
10. State the role of bar code technology in automated data capture.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the evolution of Computer Integrated Manufacturing (CIM) and its impact on modern manufacturing.

Or

- (b) Describe the major components of a CIM system and discuss its three-step implementation process.

12. (a) Discuss the system configuration and functions of an automated production line.

Or

- (b) Explain the types and applications of Automated Guided Vehicles (AGV) used in manufacturing.
13. (a) Describe the benefits of Group Technology (GT) and its application in manufacturing industries.

Or

- (b) Outline the architecture of a Flexible Manufacturing System (FMS) and discuss the factors to consider during FMS planning.
14. (a) Illustrate the sequence of steps involved in manual process planning using an example.

Or

- (b) Explain the two stages in Variant Process Planning (VPP) and the benefits of Computer-Aided Process Planning (CAPP).
15. (a) Explain the concept of linear feedback control and its importance in manufacturing processes.

Or

- (b) Describe bar code technology and its use in automatic data capture within manufacturing.

PART C — (1 × 15 = 15 marks)

16. (a) A manufacturing plant is transitioning to a fully automated, computer-integrated system to improve productivity and efficiency. Develop a basic plan that includes the selection of appropriate automation tools, such as material handling systems and process control methods, considering the plant's need for flexibility and high output.

Or

- (b) Consider a company planning to set up a Flexible Manufacturing System (FMS) for producing a diverse range of components. Identify the components needed for an FMS setup, the role of process planning, and the integration of adaptive control systems to ensure flexibility and efficiency.
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