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Question Paper Code : 12332

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

Seventh Semester

Mechanical Engineering

ME3792 – COMPUTER INTEGRATED MANUFACTURING

(Common to Production Engineering)

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the three-step process in CIM implementation.
2. Write down any one mathematical production model.
3. Define the term Dead reckoning.
4. List any two system configurations used in automated production lines.
5. Why production flow analysis is required.
6. Define the composite part concept in machine cell design.
7. Define process planning in the context of manufacturing.
8. List two advantages of using computer-aided process planning (CAPP) over manual process planning.
9. Define substitution error rate.
10. List the two basic requirements that must be managed by the controller to achieve real-time control.

PART B — (5 × 13 = 65 marks)

11. (a) Describe the different production concepts and develop simple production models with suitable examples.

Or

- (b) Discuss the major elements of a CIM system and their interrelations.

12. (a) Describe the components of automated storage/retrieval systems with a neat sketch.

Or

- (b) Elaborate the types of AGVs with neat sketches.

13. (a) Discuss the different parts classification and coding systems used in GT.

Or

- (b) Explain different FMS layout configurations with neat sketches.

14. (a) Discuss the sequencing of operations according to anteriorities and describe how a matrix of anteriorities is formed in process planning with suitable examples.

Or

- (b) Describe the flow chart showing various activities in retrieval process planning, and explain each activity in detail.

15. (a) Describe the architecture of a computer process control system and explain the role of interface hardware in ensuring proper operation.

Or

- (b) Elaborate the various automatic identification methods used in manufacturing.

PART C — (1 × 15 = 15 marks)

16. (a) Justify the need for digital and virtual manufacturing systems in achieving the goals of Industry 4.0, with relevant case studies.

Or

- (b) Given the following production flow matrix for five components (C1, C2, C3, C4, C5) and four machines (M1, M2, M3, M4) design a machine-component cell layout using the Rank Order Clustering (ROC) method, and evaluate its effectiveness in minimizing intercellular movement.

Components/Machines	M1	M2	M3	M4
C1	5	2	3	0
C2	1	4	1	2
C3	0	1	6	4
C4	2	3	4	5
C5	3	2	0	4