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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech (ME-Working Professional)

SEM: II - THEORY EXAMINATION (2024- 2025)

Subject: Computer Integrated Manufacturing

Time: 2 Hours

Max. Marks: 50

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.
2. Maximum marks for each question are indicated on right -hand side of each question.
3. Illustrate your answers with neat sketches wherever necessary.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.
6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

15

1. Attempt all parts:-

- 1-a. What is the function of a Database Management System (DBMS) in CIM? (CO1, K1) 1
- (a) Creating 3D models
- (b) Storing and managing production data
- (c) Operating CNC machines
- (d) Simulating tool paths
- 1-b. Raster scan displays are ideal for: (CO2, K1) 1
- (a) Line drawing
- (b) Complex images and shading
- (c) Point plotting
- (d) Text only
- 1-c. G Codes are primarily used to: (CO3, K1) 1
- (a) Turn coolant on/off
- (b) Specify geometric movements
- (c) Indicate machine alarms
- (d) Identify tools
- 1-d. In variant CAPP, planning is based on: (CO4, K1) 1
- (a) Logic-based rules
- (b) Group technology

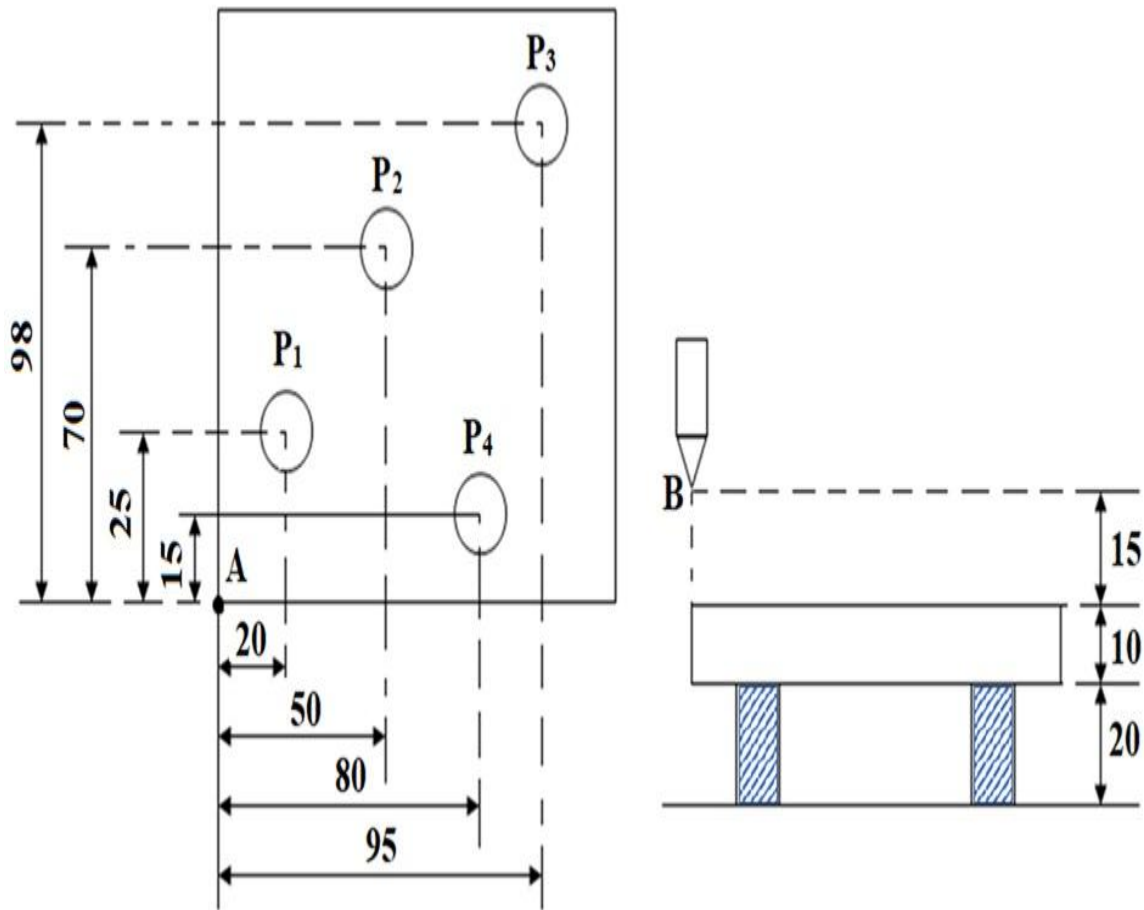
- (c) Real-time simulations
- (d) AI algorithms
- 1-e. What is the main function of reinforcement learning? (CO5, K1) 1
 - (a) Supervision
 - (b) Reward-based learning
 - (c) No learning
 - (d) Manual adjustment
- 2. Attempt all parts:-
- 2.a. What is the subsystem of CIM? (CO1, K2) 2
- 2.b. What is the need of homogeneous coordinate in transformations? (CO2, K2) 2
- 2.c. What is ATC in CNC machines? (CO3, K2) 2
- 2.d. What is the role of CAPP in manufacturing? (CO4, K2) 2
- 2.e. What is the role of IoT in creating a digital/connected factory? (CO5, K2) 2

SECTION-B

15

3. Answer any three of the following:-

- 3.a. Explain how does CIM contribute to quality assurance and product lifecycle management? (CO1, K2) 5
- 3.b. A triangular lamina having vertices A (4, 2), B (2, -2) and C (6, -2) is subjected to the translation distances $t_x = 5$ and $t_y = 7$ along the coordinate axis. Determine the transformed coordinates for the triangular lamina. (CO2, K3) 5
- 3.c. Write NC part program for the machine component of thickness 10 mm to be drill 4 holes on a part as shown in figure. The drill diameter is 10 mm, and the Z position is zero at 45 mm above the table surface. All dimensions are given in mm. Assume speed = 1000 RPM and feed = 150 mm/min. (CO3, K3) 5



- 3.d. What is concurrent engineering? How does it differ from traditional sequential engineering? (CO4, K2) 5
- 3.e. What is Deep Learning? Describe its structure, benefits, and applications in digital manufacturing. (CO5, K2) 5

SECTION-C

4. Answer any one of the following:-

- 4-a. What is the challenge in CIM integration? Explain in brief. (CO1, K2) 4
- 4-b. Define smart manufacturing and its role in modern industries. (CO1, K2) 4

5. Answer any one of the following:-

- 5-a. What are the types of geometric transformation? Write the transformation matrix for each type. (CO2, K2) 4
- 5-b. What are the different phases in the design process? Explain in brief. (CO2, K2) 4

6. Answer any one of the following:-

- 6-a. What are the advantages of using group technology in manufacturing? (CO3, K2) 4
- 6-b. Discuss the classification of NC/CNC machine tool systems based on control and machine type. (CO3, K2) 4

7. Answer any one of the following:-

- 7-a. Describe the differences between manual process planning and CAPP. (CO4, K2) 4
- 7-b. What are the principles of Design for Manufacturing (DFM)? (CO4, K2) 4

8. Answer anyone of the following:-

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| 8-a. | What are the steps involved in the product life cycle in smart manufacturing?
Explain in brief. (CO5, K2) | 4 |
| 8-b. | Explain how value chain management supports smart manufacturing. (CO5, K2) | 4 |

REG: JAN_JUN-2025