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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - THEORY EXAMINATION (2025 - 2026)

Subject: Computer Integrated Manufacturing

Time: 3 Hours

Max. Marks: 100

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

20

1. Attempt all parts:-

- | | | |
|-------|--|---|
| (1.1) | The main advantage of CIM is: [CO1, K1] | 1 |
| | (a) Increased manual work | |
| | (b) Higher product cost | |
| | (c) Improved productivity and integration | |
| | (d) Decreased use of software tools | |
| (1.2) | A cyber-physical system in smart manufacturing refers to: [CO1, K1] | 1 |
| | (a) A machine with physical gears | |
| | (b) Software only | |
| | (c) Integration of computation with physical processes | |
| | (d) Data printed on paper | |
| (1.3) | What is the purpose of coordinate systems in CAD? [CO2, K1] | 1 |
| | (a) Reduce memory | |
| | (b) Define position | |
| | (c) Store colors | |
| | (d) Zoom image | |
| (1.4) | DVST stands for: [CO2, K1] | 1 |
| | (a) Digital Video Storage Technology | |
| | (b) Direct View Storage Tube | |
| | (c) Data Video Signal Transmission | |
| | (d) Direct Visual Storage Table | |
| (1.5) | Which G Code is used for linear interpolation (cutting feed movement)? [CO3, K1] | 1 |

- (a) G00
 - (b) G01
 - (c) G02
 - (d) G03
- (1.6) In group technology, what is a "part family"? [CO3, K1] 1
- (a) Parts made from the same material
 - (b) Parts with similar geometric shapes and/or manufacturing processes
 - (c) Parts produced by the same operator
 - (d) Parts shipped to the same customer
- (1.7) CAPP is used in which stage of manufacturing? [CO4, K1] 1
- (a) Design
 - (b) Process planning
 - (c) Maintenance
 - (d) Distribution
- (1.8) Concurrent Engineering is best defined as: [CO4, K1] 1
- (a) Designing one product at a time
 - (b) Running machines simultaneously
 - (c) Integrating design and manufacturing processes
 - (d) Building concurrent prototypes
- (1.9) A smart factory is enabled by: [CO5, K1] 1
- (a) Paper records
 - (b) IoT devices
 - (c) CNC only
 - (d) Human-only control
- (1.10) The main objective of packaging optimization is to: [CO5, K1] 1
- (a) Use more plastic
 - (b) Ignore transit conditions
 - (c) Reduce material waste
 - (d) Increase packaging size

2. Attempt all parts:-

- (2.1) What is the primary goal of CIM? [CO1, K2] 2
- (2.2) What are the applications of CAD in manufacturing? [CO2, K2] 2
- (2.3) State the limitations of Group Technology. [CO3, K2] 2
- (2.4) List the material handling equipments. [CO4, K2] 2
- (2.5) Write the applications of AI in manufacturing. [CO5, K2] 2

SECTION-B

30

Answer any one of the following:-

- (3.1) Describe the processes involved in CIM with suitable examples. [CO1, K2] 6
- (3.2) Define smart manufacturing and its role in modern industries. [CO1, K2] 6

Answer any one of the following:-

- (3.3) Differentiate between Raster and Random scan display. [CO2, K2] 6
- (3.4) What type of CAD software is primarily used for 2D drafting? Explain its significance. [CO2, K2] 6

Answer any one of the following:-

- (3.5) Discuss the classification of NC/CNC machine tool systems based on control and machine type. [CO3, K2] 6
- (3.6) What are the different input media used in NC and CNC machine? Explain their advantages with other? [CO3, K2] 6

Answer any one of the following:-

- (3.7) Describe the differences between manual process planning and CAPP. [CO4, K2] 6
- (3.8) What are the principles of Design for Manufacturing (DFM)? [CO4, K2] 6

Answer any one of the following:-

- (3.9) Compare reinforcement learning with deep learning. [CO5, K2] 6
- (3.10) What are the benefits of AI-enabled inventory management? [CO5, K2] 6

SECTION-C

50

4. Answer any one of the following:-

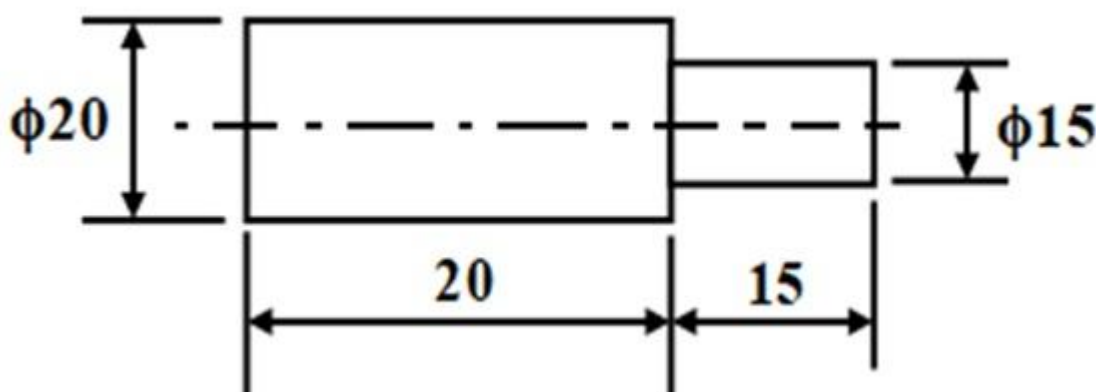
- (4.1) Discuss CIM integration in detail including physical, application, and business integration levels. [CO1, K2] 10
- (4.2) Analyze the processes involved in a typical CIM system, from CAD to logistics. Explain with a simple block diagram. [CO1, K4] 10

5. Answer any one of the following:-

- (5.1) Explain Color CRT operation using the Beam Penetration Method and Shadow Mask Method. [CO2, K2] 10
- (5.2) Find the transformation matrix and transformed coordinates of a square ABCD converted to half its size with center remains at the same position. The coordinates of vertices are A (2, 2), B (4, 2), C (4, 4) and D (2, 4) with center at (3, 3). [CO2, K3] 10

6. Answer any one of the following:-

- (6.1) Explain adaptive control systems in CNC with types, features, and advantages. [CO3, K2] 10
- (6.2) Write NC part program for the shaft of diameter 25 mm to make a stepped turning with dimensions are in mm as shown in figure. Take speed = 300 rpm and feed = 30 mm/min. [CO3, K3] 10



7. Answer any one of the following:-

- | | | |
|-------|---|----|
| (7.1) | Explain the two types of CAPP: variant and generative. Compare their advantages and limitations. [CO4, K2] | 10 |
| (7.2) | Explain the steps involved in advanced manufacturing planning. How is it different from traditional planning? [CO4, K2] | 10 |

8. Answer any one of the following:-

- | | | |
|-------|--|----|
| (8.1) | Discuss the Product Life Cycle and Value Chain Management in the context of smart manufacturing. [CO5, K2] | 10 |
| (8.2) | Discuss the challenges and limitations of implementing IoT in traditional manufacturing plants. [CO5, K2] | 10 |

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