



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi &amp; Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade &amp; Recognized Under Section 2(f) &amp; 12(B) of the UGC act, 1956

III B.Tech II Sem Supply End Examination, January 2023

**CAD/CAM**

(Mechanical Engineering)

**Time: 3 Hours.****Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.

2. In Part - A, answer all questions which carries 20 marks.

3. In Part - B, answer any one question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

**PART- A****(10\*2 Marks = 20 Marks)**

- |       |   |    |     |     |
|-------|---|----|-----|-----|
| 1. a) | Draw the block diagram of a graphics workstation                                    | 2M | CO1 | BL1 |
| b)    | List the various types of curve fitting techniques used in CAD                      | 2M | CO1 | BL1 |
| c)    | What are solid primitives?  | 2M | CO2 | BL1 |
| d)    | Write down the expressions for parametric and nonparametric expressions for sphere. | 2M | CO2 | BL2 |
| e)    | What are the applications where numerical control is most suitable?                 | 2M | CO3 | BL1 |
| f)    | List the various Motion commands and their functionality in CNC part programming.   | 2M | CO3 | BL1 |
| g)    | Why is group technology more important in the present manufacturing scenario?       | 2M | CO4 | BL1 |
| h)    | Mention the various approaches available for computer-aided process planning        | 2M | CO4 | BL1 |
| i)    | Mention various types of Flexible Manufacturing Systems (FMS).                      | 2M | CO5 | BL1 |
| j)    | What is a probe in Coordinate Measuring Machines (CMM)?                             | 2M | CO5 | BL1 |

**PART- B****(10\*5 Marks = 50 Marks)**

- |      |  |     |     |     |
|------|--|-----|-----|-----|
| 2 a) | What are the functions that get benefited by the use of computers in design and manufacturing functions?   | 5M  | CO1 | BL2 |
| b)   | Distinguish between the hierarchical and relational models of a graphic database.  | 5M  | CO1 | BL2 |
| 3    | Compare the curves for the same control points created by B-spline and Bezier spline techniques along with its basic mathematical formulations.                  | 10M | CO1 | BL2 |
| 4 a) | Draw a parametric surface patch and show the boundary conditions.  | 5M  | CO2 | BL1 |
| b)   | Find the point (0.25, 90°) on the surface of revolution of a line segment with endpoints (1, 1, 0) and (5, 2, 0). This line segment is rotated about the x-axis. | 5M  | CO2 | BL2 |

**OR**

5

Construct the following model shown in figure 1 using CSG primitives and also to develop the history tree.

10M CO2 BL2

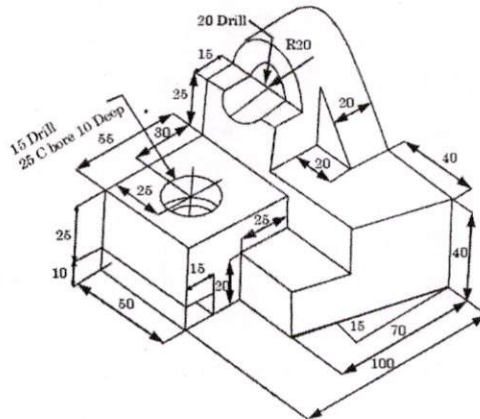


Figure 1

- 6 a) Discuss in short about the coordinate system in numerical control. 5M CO3 BL1  
 b) Explain with neat sketches the differences between the operation of the canned cycles G81 and G83. 5M CO3 BL3

OR

- 7 The component to be machined is shown in figure 2. Write a part program manually to drill all the holes. What are the advantages that can be obtained if canned cycle approach is used? All the dimensions are in mm only. 10M CO3 BL3

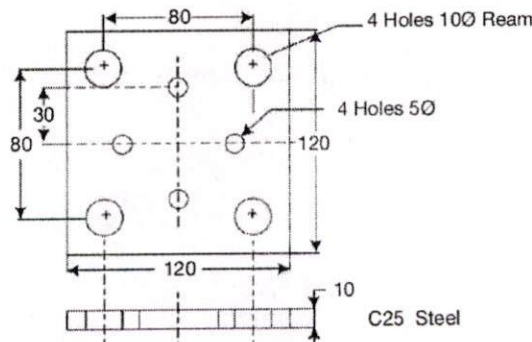


Figure 2

- 8 a) What is the difference between retrieval and generative type of computer-aided process planning? 5M CO4 BL2  
 b) What are the objectives of materials requirement planning? 5M CO4 BL1

OR

- 9 What is meant by a part family in Group Technology? Name and explain three parts classification and coding systems commonly used in GT 10M CO4 BL1

- 10 a) Draw and explain CIM Wheel indicating various elements and benefits of CIM. 5M CO5 BL1  
 b) Explain in detail the integration of CAD, CAM, CAE and CAPP systems in CIM Environment 5M CO5 BL2

OR

- 11 What is the need for automated inspection strategies in a manufacturing plant? Explain one non-contact and one non-optical inspection method with sketch. 10M CO5 BL2