WEST BENGAL UNIVERSITY OF TECHNOLOGY

ME-802A

CAD/CAM

Time Allotted: 3 Hours | Full Marks: 70

The questions are of equal value.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.

GROUP A
(Multiple Choice Type Questions)

1. Answer any *ten* questions. 10×1 = 10

(i) FMS predominantly utilizes
(A) special purpose machine (B) conventional machine tools
(C) turning centers (D) machining centers

(ii) Feature recognition is related to
(A) computer aided process planning (B) computer aided material planning
(C) robotic welding (D) none of these

(iii) Which of the following is not a synthetic entity?
(A) Hyperbola (B) Bezier curve
(C) B-spline curve (D) Cubic spline curve

(iv) The degree of Bezier curve n control points is
(A) n + 1 (B) n - 1 (C) n (D) 2n

(v) Full form of NURBS is
(A) Non-Uniform Rational Beta Spline
(B) Nonstandard Units of Rational B-Spline
(C) Non-Uniform Rational B-Spline
(D) None of these

(vi) Dwell is defined by
(A) G04 (B) G03 (C) G02 (D) G01

(vii) IGES stands for
(A) Initial Graphics Exchange System
(B) Initial Graphics Exchange Software
(C) Initial Graphics Exchange Solution
(D) Initial Graphics Exchange Specification

(viii) B-rep and C-rep are the methods of
(A) Solid modelling (B) Surface modelling
(C) Wire Frame modelling (D) 2D modeling

(ix) Group technology and CAPP are the activities of
(A) Computer Aided Engineering
(B) Computer Aided Manufacturing
(C) Computer Integrated Manufacturing
(D) Flexible Manufacturing

(x) What is DDA?
(A) Digital Different Analyzer (B) Digital Differential Analyzer
(C) Differential Digital Analyzer (D) None of these

(xi) Why Bresenham's algorithm is used?
(A) For drawing line (B) For drawing circle
(C) Both (A) and (B) (D) None of these

(xii) NC contouring is an example of
(A) continuous path positioning (B) point-to-point positioning
(C) absolute positioning (D) incremental positioning

GROUP B
(Short Answer Type Questions)

Answer any *three* questions. 3×5 = 15

2. Give reasons why raster-scan displays are used widely. 5

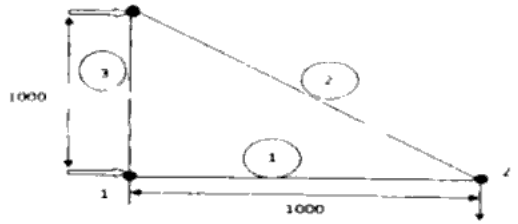
3. Explain the concept of obtaining a rotation about an arbitrary point in the XY plane. 5

4. What do you understand by CIM and lean manufacturing? 5

5. Explain the constructive solid geometry (CSG) technique used in solid modeling. 5

6. Mention the characteristic features of OPITZ part coding system. 5

7. In the fig. below shown is a truss consisting of three elements whose $\frac{EA}{L}$ value is 500N/mm. Calculate the deflection at node2. 5



GROUP C
(Long Answer Type Questions)

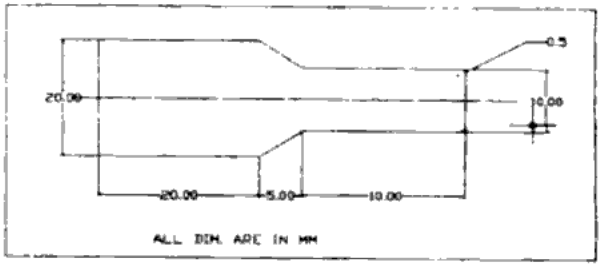
Answer any *three* questions. 3×15 = 45

8. (a) Explain the concept of 'Reverse engineering'. Under what circumstances is it recommended? 7
   (b) What is Computer-aided Quality control? How does it differ from other quality control methods? 8

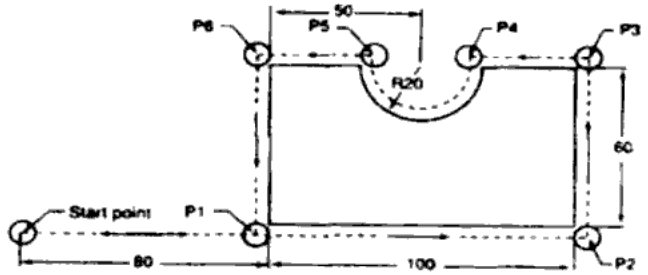
9. Rearrange the following part-machine matrix and form group technology machine cell using rank order clustering technique. 15

	Parts								
Machines	A	B	C	D	E	F	G	H	I
1	1			1				1	
2					1				1
3			1		1				1
4		1				1			
5	1							1	
6			1						1
7		1				1	1		

10. Write an NC part program for the following part. The raw material size is Φ25×40 mm long. 15



11. (a) Explain with an example various steps in the design process. 6
    (b) Write complete part program to machine the outline of the geometry as shown in figure 9



12. (a) For a given point P (1,3,-5) find 10+5
    (i) The transform point P*, if P is translated by d=2i +3j–4k and then rotated by 30° about the Z-axis and
    (ii) The transform point P*, if P is first rotated and then translated.

    Is the final point P* the same in both (i) and (ii) ? Explain your answer.
    (b) Write short notes on the following:
    (i) Surface modeling
    (ii) Solid modeling

13. (a) What is Compute Aided Process Planning? What is the significance of process chart in CAPP? 6+4+5
    (b) Describe the principle of operation of AGV.
    (c) Mention some design attributes and manufacturing attributes in the context of GT.