

[3 Hours]

[Total Marks : 80]

Note:

1. Question 1 is Compulsory
2. Solve any three from remaining five
3. Figures to right indicate full marks
4. Assume suitable data if necessary

Question

No.

Q.1

Explain any Four:

- a) Feature based modeling technique used for 3D modeling.
- b) Procedure of creating scripts for API.
- c) Turning Canned Cycle.
- d) CIM tools used with reference to a manufacturing industry.
- e) Application of RP in Science and Medicine.

Max.
Marks
20

Q.2

a) Explain Cohen-Sutherland Clipping Algorithm.

10

b) A triangle with vertices A (1 , 1) , B (2 , 1) and C (2 , 3) has to be rotated by 30° counter clockwise about a point P (3 , 2). Determine the composite transformation matrix and the new coordinates of the triangle.

10

Q.3

a) Plot a Bezier curve having control points as P_0 (1 , 2) , P_1 (3 , 4) , P_2 (6 , -6) and P_3 (10 , 8) . Take a step size of 0.2 . Also find the midpoint of the curve.

10

b) Explain Fused Deposition Modelling with its advantages, disadvantages and application.

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Q.4

a) Find the transformed coordinates when a line (3 , 4 , 1) , (4 , 2 , 2) is rotated about Z axis by an angle of 45° in anticlockwise direction.

10

b) Differentiate between

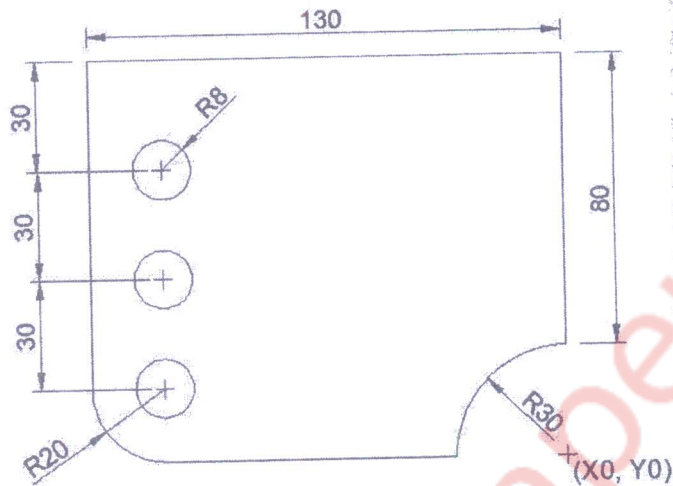
i) SLA and SLS

ii) Absolute and Incremental programming

10

Q.5

- a) Explain the need of CIM and its database requirements. 10
- b) Write a CNC part program using G and M codes for contouring a component of thickness 10mm. Also drill holes of 16mm diameter as shown in figure. Assume cutter speed as 15m/min and feedrate as 0.2 mm/rev. 10



Q.6

Write short note on:

- a) Window to Viewport Mapping
- b) Artificial Intelligence in Design and Manufacturing
- c) Fixture Component Technology
- d) Parameter Optimization

20