Time: 3 hours **Max.Marks:80**

N.B.: 1. **Q. 1 is compulsory.**
2. Solve any **three** from the remaining five questions.
3. All questions carry equal marks.

Q.1 Answer **any FOUR** (5x4=20 marks)

a) Write application of RP in Science and Medicine.
b) Explain socio-economic aspects of CIM.
c) Write a note on Artificial Intelligence in Design & Manufacturing.
d) Explain Absolute and Incremental programming methods.
e) What are the basic steps involved in FEA.

Q.2

a) A cubic Bezier curve is defined by the control points as (1,1,0); (1,2,0); (2,3,0) & (2,2,0). Find the equation of curve in parametric form and find coordinates of the points on the curve for u = 0, 0.25, 0.5, 0.75 and 1. (10 marks)

b) Write a manual part program using G&M codes for Billet size of 30*100 mm having four holes of 10mm dia at the distance of 15 mm apart vertically. (10 marks)

Q.3

a) Write a short note on 3D Rotation transformation. (10 marks)
b) What is CIM? What are its objectives? Explain the need of CIM and its database requirements. (10 marks)

Q.4

a) Explain the SLA process with advantages and its limitations. (10 marks)
b) Explain Line Clipping (Cohen Sutherland) Algorithm step by step. (10 marks)

Q.5

a) Explain the Drive and feedback systems required in CNC machines. (10 marks)
b) Triangle ABC with vertices A (2, 4), B (4, 6) and C (2, 6) is to be reflected about line 2Y= X+4 to determine the new coordinates of the triangle. Show the results graphically. (10 marks)

Q.6 Answer **any FOUR** (5x4=20 marks)

a) Explain tool length compensation.
b) Differentiate between synthetic and analytic curves..
c) Write a short note on parameter optimization.
d) What is the role of CAD/CAM in CIM, explain.
e) Explain fused deposition modeling technique.

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