

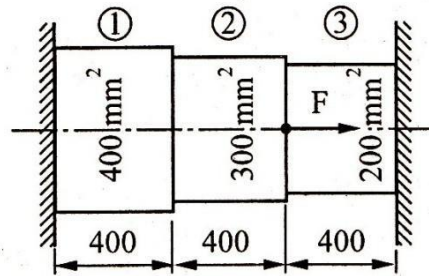
GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:2161903****Date:24-05-2024****Subject Name:Computer Aided Design****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Discuss Product cycle with CAD/CAM Tools	03
	(b) Discuss the stages of Design Process	04
	(c) Explain DDA algorithm for generation of line.	07
Q.2	(a) Compare Random Scan and Raster Scan display	03
	(b) Discuss Concept of Coordinate systems	04
	(c) Generate a straight line connecting two points (2, 7) and (15, 10) using Bresenham's algorithm.	07
	OR	
	(c) Explain Hermite Cubic Splines	07
Q.3	(a) What is B-Splines and NURBS?	03
	(b) Compare Wire frame, Surface and Solid Model.	04
	(c) A Bezier curve is to be constructed using control points $P_0(35,30), P_1(25,0), P_2(15,25), P_3(5,10)$. If the curve is anchored at P_0 and P_3 . Find the equation of the Bezier curve and plot the curve for $u=0,0.2,0.4,0.6,0.8$ and 1 .	07
	OR	
Q.3	(a) What is Octree Encoding?	03
	(b) Write short note on Boundary Representation.	04
	(c) A triangle ABC with vertices $A(30,20), B(90,20)$ and $C(30,80)$ is to be scaled by a factor of 0.5 about a point $X(50,40)$. Determine: (1) The Composite transformation matrix (2) The coordinates of the vertices for a scaled triangle.	07
Q.4	(a) Discuss the Role of CAD Engineer in Manufacturing Industries.	03
	(b) Discuss Various steps in FEA.	04
	(c) Write a parametric equation for a circle having centre at (3, 4, 2) and passing through a point (7, 6, 2). Calculate the coordinates of points on circle.	07
	OR	
Q.4	(a) Write Salient Features of Geometric Models	03
	(b) Discuss Various Elements in FEA.	04

- (c) A stepped shaft is as shown in fig. Determine the stresses and deflections in each of the sections. Assume uniform material for the complete shaft having a modulus of elasticity as 200GPa and the axial force F as 35KN.

07



- Q.5 (a) Discuss the functions of Database. 03
 (b) Discuss Extrude and Revolve in Solid modeling. 04
 (c) State and Prove Element Stiffness Matrix in Global Coordinate System for Truss Elements. 07

OR

- Q.5 (a) Discuss Types of Boundary Conditions in FEA. 03
 (b) Write Advantages and Limitations of FEA. Also Discuss Applications of FEA 04
 (c) By using a finite element method for the bar in fig. loaded as shown, determine the nodal displacements, element stresses and support reactions using minimum number of elements. Assume $E=200 \times 10^9 \text{ N/m}^2$. 07

