Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI (OLD).EXAMINATION – WINTER 2016

Subject Code: 161903 **Date: 22/10/2016**

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.**

Q.1	**(a)**	Discuss the reasons for implementing CAD. Also draw a diagram showing product cycle with the implementation of CAD.	**07**
	(b)	What are different types of geometric technique available? Describe the common facilities available in a solid modeling package.	**07**
Q.2	**(a)**	Write Bresenham's algorithm for generation of line also indicate which raster locations would be chosen by Bresenham's algorithm when scan converting a line from screen co-ordinate (1,0) to (10,3).	**07**
	(b)	Write about graphics standards. (explaination and its uses).	**07**
		OR	
	(b)	Derive the transformation matrix for the Rotation. Further give the transformation matrix for scaling,reflection and shear.	**07**
Q.3	**(a)**	Discuss: (i) Boundary representation (ii) Constructive solid Geometry representation	**07**
	(b)	State the different CAD software commercial available and explain the features of CAD software in detail. (any two software.)	**07**
		OR	
Q.3	**(a)**	For ΔABC with coordinates A(5,5), B(8,5) and C(5,10), find new vertex position if it reflected about a line y = 2x + 4.	**07**
	(b)	Derive from fundamentals the parametric equation for the Hermite Cubic spline. Represent the equation in matrix form.	**07**
.4	**(a)**	What is bound point and a free point in a design space? Distinguish it.	**07**
	(b)	What is design optimization? Explain its application and advantages in engineering design.	**07**
		OR	
Q.4	**(a)**	What is Data structure, explain how it is useful to CAD?	**07**
	(b)	Explain R.C.Johnson's optimization method with suitable examples.	**07**
Q.5	**(a)**	Explain general procedure for doing Finite Element Analysis. Give stiffness matrix for structural analysis.	**07**
	(b)	Explain Penalty approach and Elimination approach for FEA	**07**
		OR	
Q.5	**(a)**	What are the different types of Elements use in FEA	**07**
	(b)	An axial stepped bar as shown in figure -1 is subjected to an axial pull of 50 KN. If the material of the bar is uniform and has a modulus of elasticity as 200 GPa. Determine the displacement and stresses of each of the section. Also find the reaction.	**07**

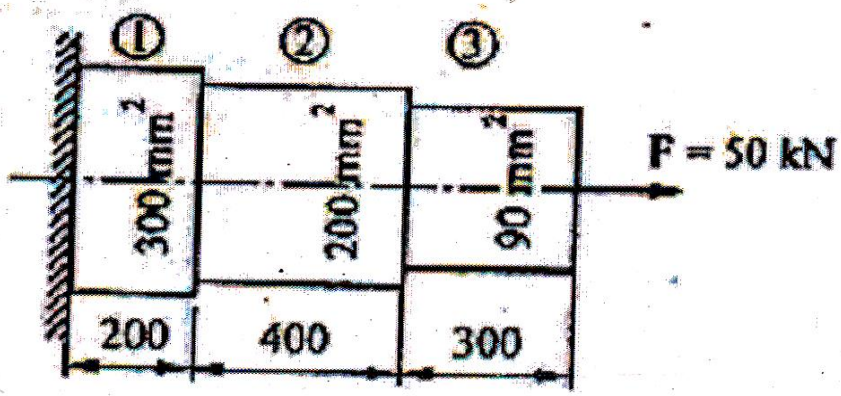

figure -1

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