Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII • EXAMINATION – SUMMER • 2015

Subject code: 180205 **Date:05/05/2015**

Subject Name: Automotive CAD

Time: 10.30AM-01.00PM **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)**	Explain different types of elements used in finite element analysis with applications.	**07**
	(b)	Explain different graphic displaying techniques.	**07**
Q.2	**(a)**	Discuss advantages, limitations & applications of CAD.	**07**
	(b)	What is optimization? Explain different techniques used for analysis of optimization.	**07**
		OR	
	(b)	Solve the following by gauss elimination method: $2x + 4y + 3z = 9$; $x - 2y + 2z = 5$; $3x + y + 2z = 4$.	**07**
Q.3	**(a)**	Write a C-program to design a clutch. Assume suitable notations and material for clutch.	**07**
	(b)	Prepare a flow chart for line drawing using DDA algorithm.	**07**
		OR	
Q.3	**(a)**	Explain various steps used in finite element method.	**07**
	(b)	Prepare a flow chart for line drawing using Bresenham's algorithm.	**07**
Q.4	**(a)**	A rectangle is formed by four points: A(25,25), B(25,125), C(75,125), and D(75,25). Calculate the coordinates of transformed rectangle if it is changed by scaling factors $S_x = 0.4$ and $S_y = 0.6$.	**07**
	(b)	Explain Plane stress and Plane strains with suitable examples.	**07**
		OR	
Q.4	**(a)**	A triangle PQR with vertices P(2,5), Q(6,7), and R(2,7) is to be reflected about the line $y = 0.5x + 3$.Determine the concatenated transformation matrix and new coordinates of the vertices for the reflected triangle.	**07**
	(b)	Develop a flow chart to implement Newton Raphson method to find roots of equations.	**07**
Q.5	**(a)**	Explain Wireframe modeling, Surface modeling, and Solid modeling with suitable sketches.	**07**
	(b)	What is the need for concatenation of transformations? Explain with suitable examples.	**07**
		OR	
Q.5	**(a)**	Write a short note on various 3D CAD softwares used in solid modeling.	**07**
	(b)	Write a short note on Bezier curves.	**07**

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