Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: X61901 **Date: 04-12-2013**

Subject Name: Computer Aided Design

Time: 02.30 pm - 05.00 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)**	Distinguish Between Conventional Design and Computer Aided Design system with CAD architecture	**07**
	(b)	What are different software package used in CAD. Give specification of CAD work station.	**07**
Q.2	**(a)**	Explain Bresenham's algorithm to plot a line whose slope is between 0° to 45°	**07**
	(b)	The coordinates of the triangle are P(50,20),Q(110,20) and R(80,60).Determine the coordinates of the vertices for the new reflected triangle, if it is to be reflected about : (i) X-axis and (ii) line y = x	**07**
		OR	
	(b)	What is graphic standard? Explain different CAD standards	**07**
Q.3	**(a)**	Explain B-spline curve and mention its advantages.	**07**
	(b)	What is synthetic surfaces ? List various synthetic surfaces and explain any three with neat sketches.	**07**
		OR	
Q.3	**(a)**	What is geometric modeling? Explain its importance in CAD / CAM applications. States the different types of geometric modeling in mechanical engineering field.	**07**
	(b)	Explain solid modeling in detail.	**07**
Q.4	**(a)**	Explain general procedure for doing Finite Element Analysis. Give stiffness matrix for structural analysis.	**07**
	(b)	Discuss different types of analysis for FEM, also mention advantages and limitations of FEM.	**07**
		OR	
Q.4	**(a)**	Discuss with neat sketch different standard elements used in FEA.	**07**
	(b)	Consider the stepped bar shown in fig. -1. A load P=200 KN is applied as shown. Determine the nodal displacements, element stresses, and support reactions. Use elimination approach for boundary conditions. Take E= $2x10^5$ N/mm^2.	**07**
Q.5	**(a)**	Discuss Johnson method of optimum design.	**07**
	(b)	Discuss in detail about the applications of optimization in engineering.	**07**
		OR	
Q.5	**(a)**	Explain following with respect to design optimization : 1) Design vector; 2) Objective function; 3) Constraint.	**07**
	(b)	What do you mean by compatible and incompatible problem in optimum design ? Explain	**07**

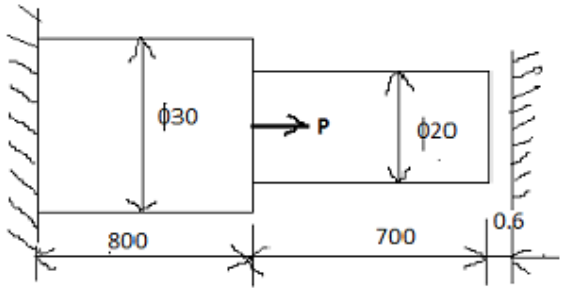

Fig.-1

All dimensions are in mm

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