

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 : **07**
(i) X-axis and (ii) line $y = x$

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. **07**
Take $E= 2 \times 10^5$ N/mm².

- 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 : **07**
1) Design vector;
2) Objective function;
3) Constraint.
(b) What do you mean by compatible and incompatible problem in optimum design ? Explain **07**

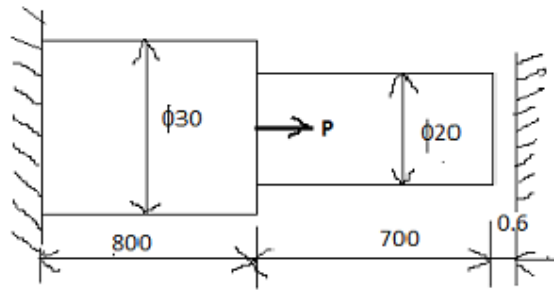


Fig.-1

All dimensions are in mm
