

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-VI Examination-Nov/Dec-2011

Subject code: 161903

Date: 25/11/2011

Subject Name: Computer Aided Design

Time: 10.30 am -1.00 pm

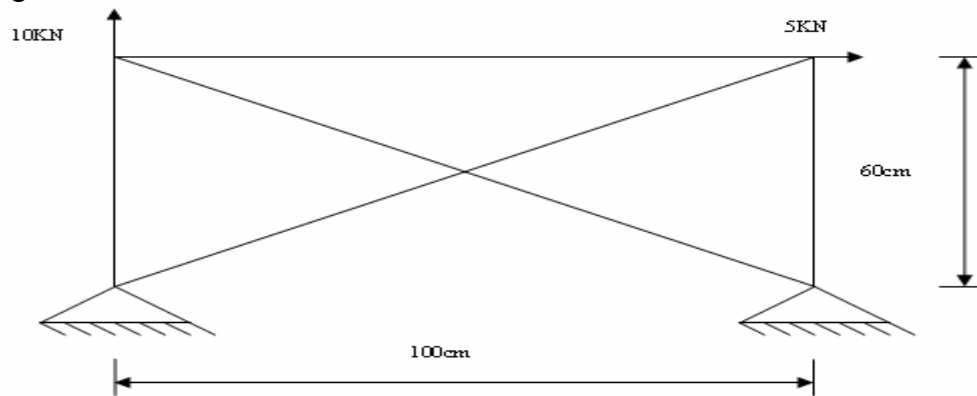
Total marks: 70

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)** Discuss: Raster scan and Frame Buffer **07**
- Q.2 (a)** Discuss Bresenham's Circle algorithm with suitable example **07**
- (b)** A rectangle is formed by the four point ABCD, whose co-ordinates are: **07**
 $A = (25, 25)$, $B = (25, 125)$, $C = (75, 125)$ and $D = (75, 25)$
Calculate the new co-ordinates:
- (i) If it is changed by scaling factors $S_x = 0.4$ and $S_y = 0.6$
 - (ii) When after scaling centre is remained at same position and scaling factor is 1.5
- OR**
- (b)** Using transformation matrix determine the new coordinates of triangle **07**
 $A(0,0)$, $B(3,2)$ and $C(2,3)$ after it is rotated 45 degree clockwise about origin
- Q.3 (a)** Generate a Bezier curve using the following control points: (2, 0), (4, 3), (5, **07**
2), (4, -2), (5, -3), and (6, -2).
- (b)** What is graphic standard? Explain different CAD standards **07**
- OR**
- Q.3 (a)** Distinguish between B-Rep and C-Rep of Solid modeling techniques **07**
- (b)** Explain properties of Bezier curve **07**
- Q.4 (a)** Discuss different types of analysis for FEM, also mention advantages and **07**
limitations of FEM.

- (b) A truss is made up of steel material with a bar size of 2cm as shown in figure: 07

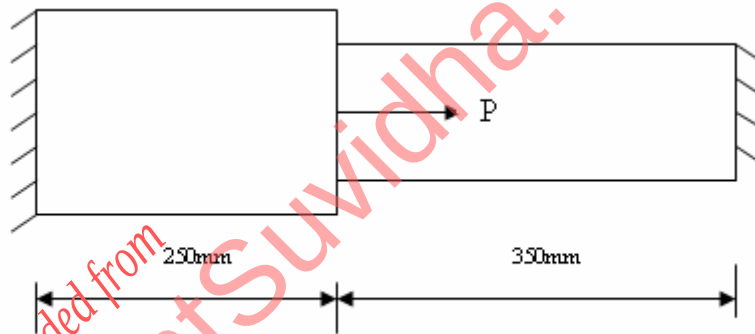


Calculate:

- Element stiffness matrix for each element
- Global stiffness matrix for entire truss

OR

- Q.4** (a) Discuss with neat sketch different standard elements used in FEA. 07
- (b) A two step as shown in figure is subjected to thermal loading conditions. An axial load $P = 200 \times 10^3 \text{ N}$ applied 20°C to the end. The temperature of the bar is raised by 50°C . 07



Calculate:

- Element stiffness matrix
- Global stiffness matrix

Consider $E_1 = 70 \times 10^3 \text{ N/mm}^2$, $E_2 = 200 \times 10^3 \text{ N/mm}^2$, $A_1 = 700 \text{ mm}^2$, $A_2 = 1000 \text{ mm}^2$, $\alpha_1 = 23 \times 10^{-6} \text{ per } ^\circ\text{C}$ and $\alpha_2 = 11.7 \times 10^{-6} \text{ per } ^\circ\text{C}$

- Q.5** (a) What do you mean by primary and subsidiary design equation? Explain with example 07
- (b) Discuss Johnson method of optimum design. 07

OR

- Q.5** (a) What do you mean by compatible and incompatible problem in optimum design? Explain 07
- (b) What is CAD database? Explain the advantage of database with popular database models. 07
