TE-II | CAD & FEA | 13/05/15 PROD (Rev)

Q.P. Code : **3284**

(3 Hours) [Total Marks : 80]

N.B. : (1) Question **No. 1** is compulsory.
     (2) Solve any **three** questions from the remaining **five** questions.
     (3) Assume suitable data if required and state them clearly.
     (4) Figures to the right indicate **Full Marks**.

1. Attempt any four from the following.   20

    (a) Explain the general procedure or steps involved in Finite Element method analysis.

    (b) Explain sources of error in F.E.A. Solution.

    (c) Write a brief note on geometric modelling.

    (d) State the various applications of F.E.A.

    (e) Explain random scan and raster scan display techniques.

2. (a) Find the raster locations of a line from (2,5) to (11,13) using DDA   8
       algorithm. Also Draw a sketch showing all pixel locations.

    (b) Analyse the following truss completely. i.e. for displacements, reactions,   12
       stresses and strains.
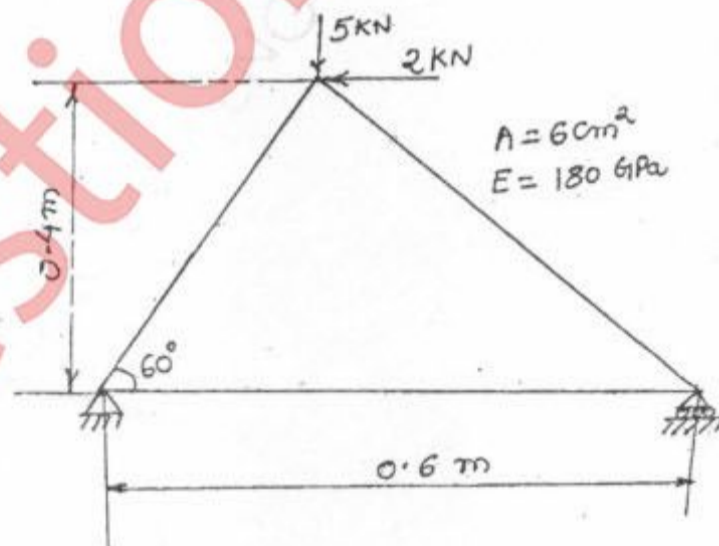
3. (a) Reflect a triangle ABC having coordinates A(1,7), B(1,10) and C(4,10).   10
      about a line y=x+4. Find the concatenated transformation matrix and the
      coordinates of the reflected matrix.

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(b) What is Product data exchange? Explain any two standard formats.   10

4. (a) Consider the bar in the figure given below and determine nodal   10
displacements, stresses and support reactions. Given E = 200 GPa.
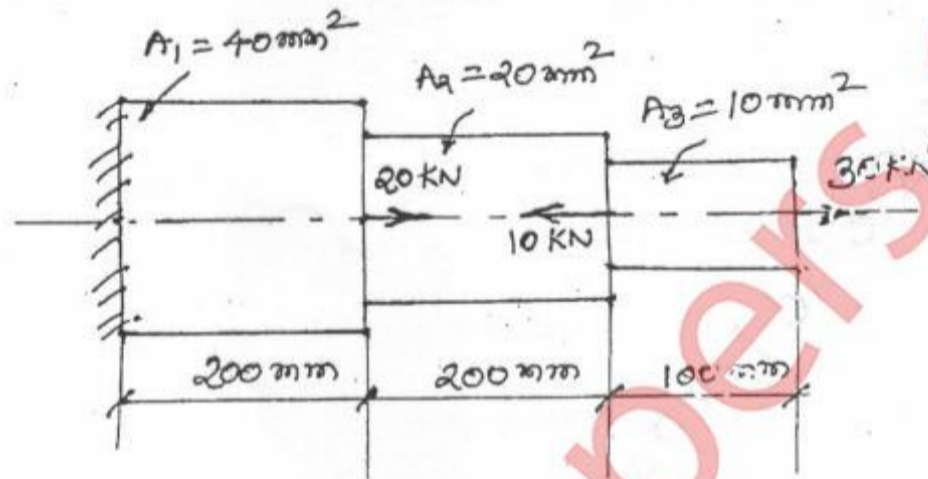
(b) Formulate a global stiffness matrix for a three noded linear element   10
considering thermal stresses.

5. (a) Write a note on windowing and clipping. Explain Cohen Sutherland   10
algorithm for line clipping.

(b) Formulate 2-D CST (Constant strain triangle) element for F.E.A.   10

6. Write short notes on the following: 20
   (a) Color Models.
   (b) Product life cycle with CAD Overlay.
   (c) Meshing and Compatibility.
   (d) Properties of Bezier and B-Spline Curves.