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A – 2816

Reg. No. :

Name :

**Sixth Semester B.Tech. Degree Examination, May 2016
(2008 Scheme)**

**08.603 : COMPUTER AIDED DESIGN
(MPU)**

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. Explain the role of CAD in a design procedure.
2. Explain the methods of defining line, circle and surfaces.
3. Compare the performance of CRT and LCD.
4. Discuss different types of memory in a computer system.
5. Write the general 3D rotational matrix.
6. Show that the area of transformed triangle is equal to the product of the area of untransformed triangle and the determinant of transformation matrix.
7. Write general steps in FEA.
8. What is a shape function ? State its characteristics.
9. Explain the windowing and clipping used in computer graphics.
10. What is isoperimetric element ?



(4×10=40 Marks)

P.T.O.



PART - B

Answer **one full** question from **each** Module.

Module - I

11. a) Derive the element stiffness matrix for a bar element.
b) A CST element has its vertices at A(100, 100), B(400, 100), C(200, 400). Assemble the strain displacement matrix. Take the thickness of the element as 20 mm and modulus of elasticity as 200 GPa.
12. a) What are the steps to be taken for the static analysis of any structure using a FE software package ?
b) Write notes on the following input devices :
i) Touch pad
ii) Touch screen
iii) Optical Mouse
iv) Bar code reader
v) Scanner.

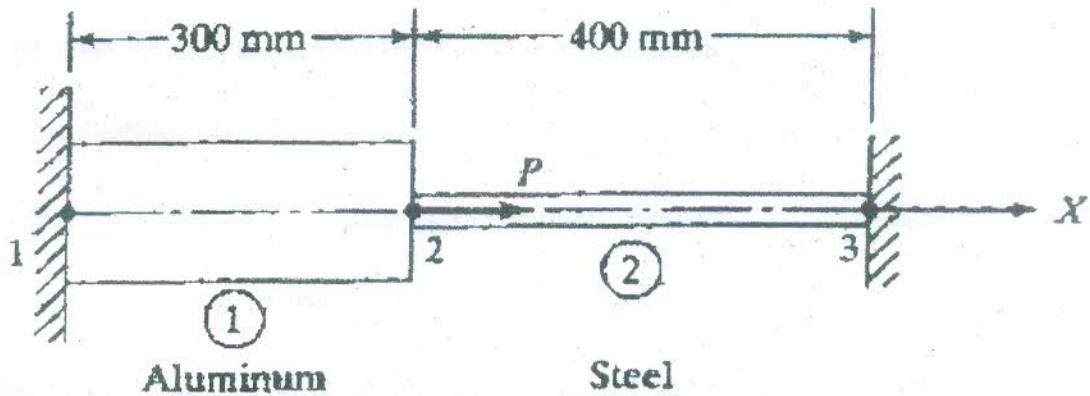
Module - II

13. a) Describe with sketches 3D modelling using wire frame, surface and solid models.
b) A unit cube is to be rotated about 30° about X axis, 45° about Y axis and then about Z axis at an angle 60° (Assume one corner is at origin and one face is parallel to XY plane). Find the coordinates of final transformed cube.
14. a) A point (4, 8) is translated by 4 units in x and y direction and scaled by 2 units in x and y direction and then rotated by 30° in clockwise. Obtain the final coordinates of the point.
b) Discuss the application of different types of 3D models.



Module - III

- 15. a) Write the step by step procedure for the derivation of stiffness matrix for a bar element in local coordinates.
- b) Derive the transformation matrix and stiffness matrix for a bar in 3D space.
- 16. a) What do you meant by Z Buffer Algorithm and Scan Line Z-Buffer Algorithm ?
- b) Consider the bar shown in figure below. An axial load $P = 200 \times 10^3$ N is applied as shown. Determine :
 - i) Nodal displacements
 - ii) Stress in each material
 - iii) Reaction forces.



$A_1 = 2400 \text{ mm}^2$

$A_2 = 600 \text{ mm}^2$

$E_1 = 70 \times 10^9 \text{ N/m}^2$

$E_2 = 200 \times 10^9 \text{ N/m}^2$

(20x3=60 Marks)

