

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2766

Roll No.

0903240090

B.Tech.

(SEM. VII) ODD SEMESTER THEORY EXAMINATION 2012-13

COMPUTER AIDED DESIGN

Time : 3 Hours

Total Marks : 100

Note : (1) All questions are compulsory.

(2) Assume any missing data suitably.

1. Attempt any **four** parts :— (4×5=20)
 - (a) Discuss colour CRT monitors.
 - (b) Discuss Direct view storage tubes.
 - (c) Discuss Raster scan display.
 - (d) Discuss the concept of integrated CAD/CAM system.
 - (e) Discuss Flat panel display.
 - (f) Discuss windowing and clipping.

2. Attempt any **four** parts :— (4×5=20)
 - (a) Discuss mid point circle algorithm.
 - (b) Using Bresenham's line algorithms, find the pixel positions along the line path between end points (15, 8) & (28, 16).
 - (c) Using scaling magnify the triangle with vertices A(0, 0), B(1, 1) and C(5, 2) to thrice its size keeping C(5, 2) fixed.
 - (d) Discuss Homogeneous coordinate system.
 - (e) Discuss Shearing transformation.
 - (f) Discuss World Coordinate representation.

3. Answer any two parts :— (10×2=20)

(a) Find the blending functions of Bezier curve for five control points. Plot the blending functions.

(b) Cubic spline curve is defined by the equation

$$P(u) = C_3u^3 + C_2u^2 + C_1u + C_0$$

Find four control points that define an identical Bezier curve.

(c) Discuss B-spline curves and its properties.

4. Answer any two parts :— (10×2=20)

(a) Find the values of a, b and c so that

$Y = a + bx + cx^2$ is the best fit to the data

$$x = 0, 1, 2, 3, 4$$

$$y = 1, 0, 3, 10, 21$$

Use least square method.

(b) From the following table of values of x & y obtain $\frac{dy}{dx}$

and $\frac{d^2y}{dx^2}$ for $x = 1.2$.

$$x = 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2$$

$$y = 2.7183, 3.3201, 4.0552, 4.9530, 6.0496, 7.3891, 9.0250$$

(c) For the axially loaded member shown in Fig. determine the nodal displacements and reaction at fixed end.

Given :

$$\text{Area of Aluminium rod} = 32 \times 10^{-4} \text{ m}^2$$

$$\text{Area of Brass rod} = 12 \times 10^{-4} \text{ m}^2$$

$$\text{Modulus of Elasticity } E_{Al} = 70 \text{ GPa}$$

Modulus of Elasticity $E_{\text{Brass}} = 100 \text{ GPa}$

Axial load $P_2 = 250 \text{ kN}$

Axial load $P_3 = 80 \text{ kN}$

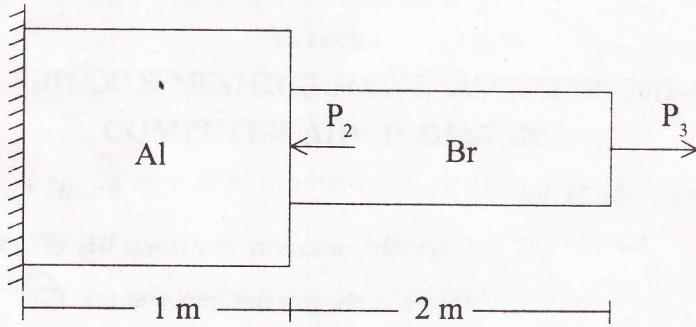


Fig. 1

5. Write short notes on any **four** of the following :— (4×5=20)

- (a) Blobby objects.
- (b) Super quadric surface.
- (c) Constructive solid geometry.
- (d) Solid modeling.
- (e) Graphics functions.
- (f) Shape function in FEM.

Ashutosh

$$\Rightarrow \frac{EA}{L} \begin{bmatrix} 1 & -1 \\ -1 & 3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 500 \\ 0 \end{bmatrix}$$
$$\frac{EA}{L} \begin{bmatrix} x_1 - x_2 \\ -x_1 + 3x_2 \end{bmatrix} = \begin{bmatrix} 500 \\ 0 \end{bmatrix}$$

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