Printed Pages—3   **EME701**

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

| PAPER ID : 2766 | Roll No. | | | | | | | | | | |

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.

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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 $\dfrac{dy}{dx}$

and $\dfrac{d^2y}{dx^2}$ for $x = 1 \cdot 2$.

$x = 1 \cdot 0,\ 1 \cdot 2,\ 1 \cdot 4,\ 1 \cdot 6,\ 1 \cdot 8, 2 \cdot 0, 2 \cdot 2$

$y = 2 \cdot 7183, 3 \cdot 3201, 4 \cdot 0552, 4 \cdot 9530, 6 \cdot 0496, 7 \cdot 3891,$
$\quad 9 \cdot 0250$

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

Given :

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

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

Modulus of Elasticity E_{Al} = 70 GPa

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Modulus of Elasticity E_{Brass} = 100 GPa

Axial load P_2 = 250 kN

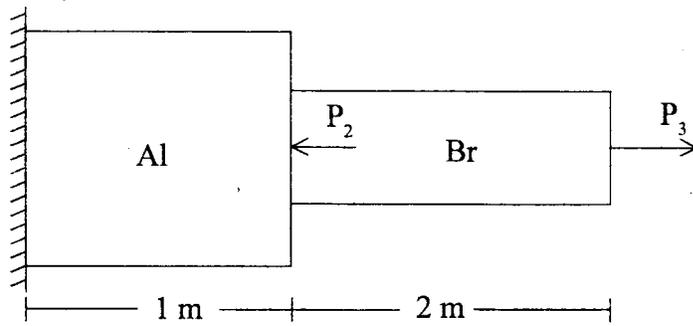Axial load P_3 = 80 kN

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.

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