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| (Following Paper ID and Roll No. to be filled in your Answer Book) |
| **PAPER ID : 2766**   Roll No. |

B.Tech.

(SEM. VII) THEORY EXAMINATION 2011-12

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 of the following :   **(5×4=20)**

    (a) Discuss the major elements of computer aided design.

    (b) Write short notes on Track Ball and Optical Character Recognition.

    (c) Differentiate between Random and Raster Scan Display.

    (d) Explain the different phases of product development cycle.

    (e) Explain the working principle of liquid crystal display.

    (f) What are the specifications of good CAD software ? Give a typical specification of CAD hardware.

2. Attempt any **two** parts of the following :   **(10×2=20)**

    (a) A square having end point at A(2, 2), B(8, 2), C(8, 8) and D(2, 8) is rotated by 50° in clockwise direction keeping point B fixed. Find the final coordinates.

(b) Scan convert a circle whose centre is (10, 15) and radius is 12 units. Using mid-point circle drawing algorithm.

(c) What is geometric transformation ? Find the reflection matrix when the axis of reflection is given by y = 5x. Also determine the reflection of point (7, 5) about this axis.

3. Attempt any **two** parts of the following :　　　　(10×2=20)

(a) Explain the main properties of a Bezier Curve. Generate a Bezier Curve for following control points : A[1, 1], B[4, 3], C[5, 2] and D[3, 1].

(b) Briefly discuss the generation of 2D curves. What are the difficulties of using non-parametric curves ? What advantages does a parametric curve offer for representing curves ?

(c) Differentiate between Bezier, B-Spline and Hermite curves. Find the equation of a Hermite cubic spline that passes through points (1, 2) and (3, 4) and whose tangent vectors are the two lines connecting these two points with point (3, 6).

4. Attempt any **two** parts of the following :　　　　(10×2=20)

(a) Write short notes on quadric and super-quadric surfaces.

(b) Explain constructive solid geometry. What is the role of Primitives and Boolean operations in CSG ? Explain with suitable examples.

(c) Explain the use of following commands in AUTOCAD :

   (i) Hatch

   (ii) Polyline

   (iii) Rotate

   (iv) Mirror

   (v) Chamfer.

5. Attempt any **two** parts of the following :   **(10×2=20)**

  (a) Discuss the algorithm of Bisection method and determine the real roots of $x \, log_{10} x = 1.6$ using five iterations.

  (b) A cantilever beam carries a concentrated load P and its free end. The maximum deflection of free end for different values of P was recorded and given in the table. Using least square method find the best fitting curve for the data.

Load (P) N	50	70	90	110	130	150
Deflection (x) mm	0.40	0.50	0.60	0.72	0.80	0.94

  (c) Consider the stepped bimetallic bar made of aluminium and brass is subjected to an axial loads as shown in figure. Develop a finite element model of the problem and find out

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nodal displacements, element stresses and reaction forces

at supports. Given that

Material	Cross section area (mm²)	Young's modulus (GPa)
Aluminum	600	70
Brass	300	85