Paper Code: ME-701	**Roll No.**									

B.Tech.
SEVENTH SEMESTER EXAMINATION, 2016-17
COMPUTER AIDED DESIGN

[Time: 3 Hours] [Total Marks: 100]

Note: Attempt ***ALL*** questions. Assume suitable data, if required. All question carry equal marks.

1. Attempt any *four* parts of the following: - **(5×4=20)**

(a) Enumerate the basic difference between CAD/CAM and production automation.

(b) Briefly explain the various steps involve in a design process.

(c) Write short note on the following, (i) OMR (ii) Joystick (iii) Laser Printer.

(d) Write short note on Raster scan display device. State advantage and disadvantage.

(e) Explain the working of a LCD device.

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

(a) What do you understand by composite Transformation? Consider a triangle whose vertices are (2, 2), (4, 2) and (4, 4). Find concatenated transformation matrix and the transformed vertices for rotation of 90^o about the origin, followed by reflection through the line (y= -x).

(b) Show that for the mid-point circle algorithms, the initial decision parameter,

$$P_0 = (1- r)$$

Where r = radius of circle.

(c) (i) What are the various Graphics standards?
(ii) What are the different data base coordinate systems?

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

(a) A cubic spline curve is defined by the equation

$$P(u) = C_3 u^3 + C_2 u^2 + C_1 u + C_0 \qquad 0 \leq u \leq 1$$

Where C_3, C_2, C_1 and C_0 are the polynomial coefficients. Assuming these coefficients are known, find the four control points that define an identical Bezier curve.

(b) Find the equation of a Hermit Cubic Spline which passes through (1, 3) and (3, 5) and whose tangent are two lines connecting these two points with point (2, 5). Discuss the properties of Hermite Cubic Spline.

(c) (i) What are the properties for curve designing and representation? Explain parametric continuity conditions.

(ii) Explain the parametric representation of analytical curve. What are the differences between Interpolation and Approximation?

4. Attempt any *four* parts of the following: - **(5 ×4=20)**

(a) What is meant by Sweep representation operation in solid modeling?

(b) Write 5 drawings and 4 editing commands in Auto CAD.

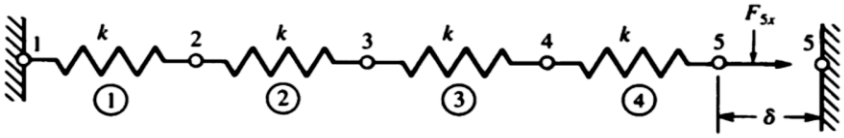
(c) What do you mean by Colour Models? Explain different type of Colour Models.

(d) Write short note on Blobby Objects.

(e) What do you mean by Half Spaces?

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

(a) Taking two element spring system, find the element stiffness matrices and then global stiffness matrix for finite element method (FEM) to yield: **[K] {D} = {F},** Where, K= Global stiffness matrix, D = Displace matrix, F = Force matrix. Also find the displacement at each node for the given spring system. The spring constant k = 200 kN/m and the displacement δ = 20 mm.



(b) Find 'x' for which 'y' is maximum from the data given in table. And find the value of 'y'.

x	1.2	1.3	1.4	1.5	1.6
y	0.9320	0.9636	0.9855	0.9775	0.9996

(c) (i) A solid of revolution is formed by rotating about x axis, the lines x=0 and x=1 and a curve through the points with the following co-ordinate, estimate the volume of the solid formed using 1/3 Simpson's rule.

x	0	0.25	0.5	0.75	1
y	1	0.9896	0.9589	0.9089	0.8415

(ii) Show that the square root of N=AB is given by

$\sqrt{N} = \{S/4\}+\{N/S\}$ where S= A+B