

Printed Pages: 2

Paper Id: 140701

Sub Code: NME701/NPL701

Roll No.

**B. TECH
(SEM VII) THEORY EXAMINATION 2018-19
COMPUTER AIDED DESIGN**

Time: 3 Hours

Total Marks: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief.

2 x 10 = 20

- What are the elements of CAD?
- Wright down the differences between Random Scan Display and Raster Scan Display.
- What is the need of graphics standards? List some of the graphics standards.
- What are the important functions of graphics software?
- What do you understand by the terms interpolation and approximation for representation of curve?
- What do you mean by order of continuity of curves?
- What do you understand by Blobby Objects?
- List the five editing commands used in Auto Cad.
- What are different types of errors in FEM solutions?
- What are pre-processors and post-processors?

SECTION B

2. Attempt any three of the following:

10 x 3 = 30

- What are the main components of Cathode Ray Tube? Explain its principle of operation with a line diagram.
- Using midpoint Bresenham's circle generating algorithm, determine pixel positions along circle in the first quadrant from line $x = 0$ to line $x = y$. The radius of circle is 10 units. Plot the generated pixel positions.
- Determine Blending functions of Hermite curve. What are the limitations of Hermite curves? How do they remove in Bezier curves?
- What do you mean by solid modeling? What are the different techniques of solid modeling used in 3D graphics? Explain with suitable examples.
- Derive an expression for stiffness matrix of one dimensional truss element.

SECTION C

3. Attempt any one part of the following:

10 x 1 = 10

- How the computer is useful in design and manufacturing of a product? Explain briefly the following in CAD environment – CAE, CAM, CIM
- Explain the working principles of the following graphics devices with neat line sketches.
 - Digitizers
 - Liquid Crystal Display (LCD)

4. Attempt any *one* part of the following:

10 x 1 = 10

- (a) What do you understand by the term windowing and clipping during the viewing transformations of images in computer graphics? Explain with suitable examples.
- (b) Find the transformation matrix and transformed coordinates of a square ABCD converted to half its size with centre remains at the same position. The coordinates of vertices are A (2, 2), B (4, 2), C (4, 4) and D (2, 4) with centre at (3, 3).

5. Attempt any *one* part of the following:

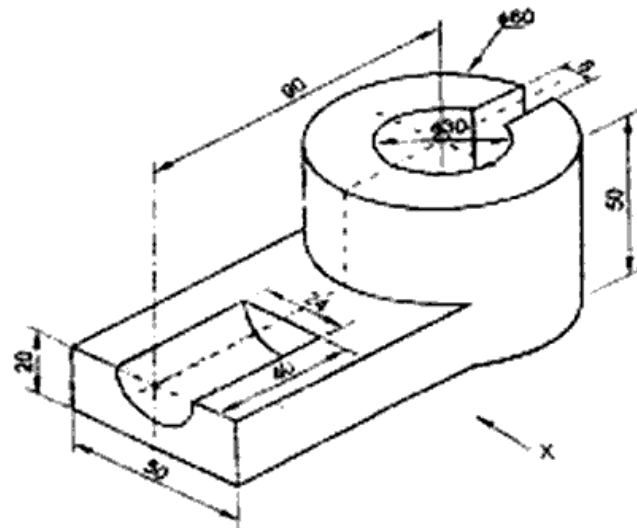
10 x 1 = 10

- (a) Distinguish between the analytic curves and synthetic curves. Describe essential requirements for the synthetic curves in computer graphics.
- (b) Generate parametric equation of a planer Bezier curve defined by the four control points P_0 (1, 2), P_1 (3, 4), P_2 (6, -6) and P_3 (9, 7) and plot them.

6. Attempt any *one* part of the following:

10 x 1 = 10

- (a) Draw a schematic diagram and explain the working of colour monitor display devices. Also explain RGB and CMY colour models.
- (b) Construct the following model using CSG standard primitives and also to develop the history tree.



7. Attempt any *one* part of the following:

10 x 1 = 10

- (a) Explain general methodology of solving a design problem using finite element method. Also write the advantages of FEM.
- (b) Determine the nodal displacements, element stresses and support reactions for the bar shown in figure below. The cross-sectional areas are 250 mm^2 and 400 mm^2 .
Young's modulus $E = 200 \times 10^9 \text{ N/m}^2$.

