Printed Pages: 2 **Sub Code: NME701/NPL701**

Paper Id: 140701 **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

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

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. What are the main components of Cathode Ray Tube? Explain its principle of operation with a line diagram.
b. 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.
c. Determine Blending functions of Hermite curve. What are the limitations of Hermite curves? How do they remove in Bezier curves?
d. What do you mean by solid modeling? What are the different techniques of solid modeling used in 3D graphics? Explain with suitable examples.
e. 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

(a) How the computer is useful in design and manufacturing of a product? Explain briefly the following in CAD environment – CAE, CAM, CIM
(b) Explain the working principles of the following graphics devices with neat line sketches:
    (i) Digitizers
    (ii) 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

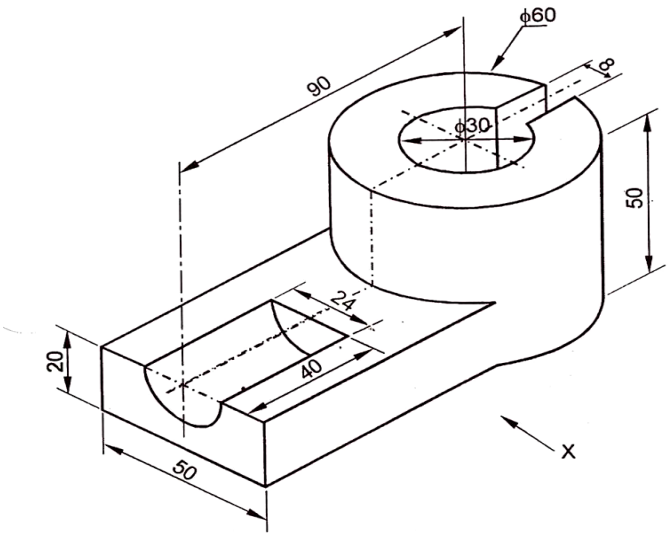
(a) Distinguish between the analytic curves and synthetic curves. Describe essential requirements for the synthetic curves in computer graphics.

(b) Generate parametric equation of a planer Bezier curve defined by the four control points P_o (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 modulus E = 200 x 10^9 N/ m^2.