Q.P. Code: 27647

[Duration: Three Hours]   [Marks: 80]

1.   Question No. **1** is **compulsory.**

2.   Attempt **any three** questions **from remaining five** questions.

3.   **Assume suitable data wherever required** with proper **justification.**

4.   Answers should be supplemented by **neat sketches, wherever possible.**

Q.1 Explain the following: (20)

    a)   Explain B-rep and CSG type solid modeling with example.
    b)   Application of finite element analysis.
    c)   Color Model.
    d)   Parallel Projection.

Q.2

    a)   Use the Bresenham's algorithm to rasterize the line from (6,6) to (14,10).   (10)
       Also plot the pixel positions.

    b)   Write short note on windowing and clipping. Explain Cohen Sutherland algorithm   (10)
       for line clipping

Q.3

    a)   A triangle formed by three points A,B,C whose coordinates are A(50,40), B(100,60), C(70,80)
       Calculate the new coordinates if the triangle is reduced in size using the scale factor $Sx=0.5, Sy=0.7$
       and the base point is A.   (10)
    b)   What is product data exchange? Enlist different data exchange formats available and explain   (10)
       any one in details.

Q.4   Find out transformation matrix to align vector $V=2i+3j+k$ with vector K   (20)

Q.5

    a)   Construct the Bezier curve of order 3 and with polygon vertices A(1,1), B(2,3), C(4,3), D(6,4).   (10)
    b)   Explain flood fill algorithm for polygon filling.   (10)

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Q.6 Explain the following:
(20)

    a) Effects of scan conversion.
    b) Shading Model.
    c) Properties of Bezier and B-Spline curve.
    d) Raster scan graphics.

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