T3325 / T0527   COMPUTER GRAPHICS AND VIRTUAL REALITY

QP Code:594303

(3 Hours)   [Total Marks : 80
CGVRold

N.B. : (1) Question **1** is compulsory.
(2) Attempt any **three** from remaining Questions.
(3) **Assume** suitable **data** wherever **necessary**.
(4) **Figure** in **right** indicates **marks**.

1. (a) What are fractals? Derive an equation $D = \log N / \log S$.   20
    (b) Compare boundary fill and flood fill algorithm
    (c) Explain VR application in education domain
    (d) Differentiate between raster scan and Random scan display

2. (a) Explain Sutherland- Hodgeman polygon clipping algorithm with suitable 10
        example. Discuss its advantages and disadvantages.
    (b) Derive the Bresenham's line drawing algorithm. What are its advantages? 10
        Take suitable example and draw a line between two points

3. (a) Write a short note on Homogeneous co-ordinate system.   10
    (b) Explain graphical rendering pipeline.   10

4. (a) What are different types of projections? Derive the matrix representation 10
        for Perspective transformation in XY - plane and on negative Z- axis.
    (b) Derive the matrix for Rotation about an arbitrary point for 2D Rotation. 10

5. (a) Let ABCD be the rectangular window with A(20,20), B(90,20), C(90,70), 10
        and D(20,70). Find region codes for endpoints and use Cohen Sutherland
        algorithm to clip the lines P1P2 with
        P1 (10,30), P2 (80,90) and
        q1q2 with q1(10,10), q2(70,60)
    (b) Explain B spline curve   10

6. (a) Show that transformation matrix for reflection about line y=x is equivalent 10
        to reflection to X axis followed by counter clockwise rotation of 90 degree.
    (b) Derive mathematical representation for Beziers curve and state their   10
        property

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