No. of Printed Pages : **2**

Sl. No.

C1-R4 : ADVANCED COMPUTER GRAPHICS

NOTE :
1. **Answer question 1 and any FOUR questions from 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Total Time : 3 Hours **Total Marks : 100**

1. (a) Explain the basic rules of Animation.
(b) What is component of Computer Graphics.
(c) Define the following terms: Aspect Ratio, Resolution and Refresh rate.
(d) Write a procedure to perform the clipping against the concave windows.
(e) Explain polygon clipping with example.
(f) Differentiate between parallel and Perspective Projection.
(g) Explain 4-connected and 8-connected for boundary region.

(7x4)

2. (a) "Two successive rotations could be performed in either order and the final position would be the same." Justify the statement with proper logic.
(b) A unit square has been changed in to a parallelogram by stretching it along the diagonal from (0,0) to (1,1), and rotate it diagonally on to the y axis and double its length with the transformation parameters θ = 45 degrees.
(c) Explain the inverse transformation. Derive the matrix for inverse transformation.

(6+6+6)

3. (a) Derive the equation to compute new coordinates of object when it is mapped from window to viewport ?
(b) How do you identify whether a polygon is convex or concave ?
(c) A unit cube whose coordinates are A(0,0,1), B(1,0,1), C(1,1,1) D(0,1,1) E(0,0,0) F(1,0,0) G(1,1,0) H(0,1,0) is sheared in all three directions i.e., X, Y & Z.. What would be the new coordinates of the cube ?

(6+6+6)

4. (a) How Window port is given by (100,100,300,300) and viewport is given by (50,50,150,150). Convert the Window port to co-ordinates (200,200) to the viewport co-ordinate.
(b) "A set of polygon and lines form a 3D surface and solid". Explain whether this statement is TRUE or FALSE.
(c) What are the various types of vanishing points in computer graphics ? Explain in detail.

(7+6+5)

5. (a) Explain with diagram, Different orders of Continuity of curves.

(b) Compute the Bezier curve points where the Bezier polygon control points are (50,180) (250,100) (600,300) and (500,50).

(c) "Hermite curves can be defined by two points and two tangent vectors". Justify whether the statement is TRUE or FALSE. Support your answer with suitable example.

(6+6+6)

6. (a) What is the role of Intensity attenuation in terms of illumination ?

(b) What is the utility of additive and subtractive color models ?

(c) Illustrate the sub division algorithm for Curved surfaces.

(6+6+6)

7. (a) How to explore the solid object with example sweep and boundary representation of solid objects ?

(b) At the time of making animation, timeline window is used and selected. What options are compulsory in timeline window ? Describe briefly.

(c) What are the different symbol notation that are used to differentiate between tweened and Frame-by-frame animation ?

(6+6+6)

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