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Roll No.

333655(33)

B. E. (Sixth Semester) Examination, April-May 2021

(New Scheme)

(IT Branch)

COMPUTER GRAPHICS and ANIMATION

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) from each question is compulsory having 2 marks and solve any two parts from remaining parts (b), (c) and (d) of each question having 7 marks.

Unit-I

1. (a) Define Aspect Ratio.

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- (b) Explain Bresenham line drawing algorithm. Also draw line from (20,10) to (30,18) using this algorithm.
- (c) Write short notes on Flood Fill and Boundary Fill algorithm.
- (d) Consider a line PQ with co-ordinates P(1,1) and Q(10,10) :
- (i) Reflect the line about y axis and then about the line $y = -x$.
- (ii) Rotate the line by -270° prove that the transformed object in both the cases is the same.

Unit-II

2. (a) What is clipping and clip window?
- (b) What is normalized co-ordinate system? Define the equation for mapping a point (x_w, y_w) defined in window to viewport location (x_v, y_v) .
- (c) Use Cohen-Sutherland algorithm to clip a line $P_1(75,45)$ and $P_2(75,45)$ against a window with

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- lower left corner (50,10) and upper right corner (80,40).
- (d) How polygon clipping differs from line clipping? Also explain how Weiler-Atherton polygon clipping is different from Hodgeman-Sutherland algorithm.

Unit-III

3. (a) Define Convex Hull and Convex Polygon.
- (b) Construct a Bezier Curve of order 3 with 4 polygon vertices $A(1,1)B(2,3)C(4,3)$ and $D(6,4)$.
- (c) Write and explain the important properties of B-Spline curve.
- (d) Describe the Parametric and Geometric continuity conditions with example.

Unit-IV

4. (a) What is Vanishing Point?
- (b) Describe Axonometric and Oblique projections in detail.
- (c) Why hidden surface removal is required? Describe Z-Buffer algorithm in detail.

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(d) Write short notes on :

(i) Gouraud Shading

(ii) Phong Shading

Unit-V

5. (a) What is Morphing?

(b) Give the classification of Fractals.

(c) Describe Generation of Terrain-random midpoint displacement method.

(d) Write short notes on the following :

(i) Octrees

(ii) Ray Tracing