(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

FIFTH SEMESTER [BCA] JANUARY-FEBRUARY 2023

Paper Code: BCA-303 ***Subject: Computer Graphics***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit.

Q1 **Answer the following questions:-** **(2.5x10=25)**

(a) Differentiate Quadtrees and Octrees.
(b) Differentiate U and U* operators.
(c) Consider a Raster scan system with the resolution of 1280 by 1024. What size of frame buffer is needed (in Kilo Bytes) if 12 bits per pixel are to be stored?
(d) What do you mean by scan conversion? Give examples of algorithms used for scan conversion of a circle.
(e) What is antialiasing? What are various techniques for antialiasing?
(f) What is the need of Hidden surface removal algorithms?
(g) What are various anomalies associated with Perspective projection?
(h) Differentiate interpolation and approximation methods for spline representation.
(i) What are various desirable properties for a solid representation?
(j) What do you mean by the statement" Translation and Rotation are rigid body transformations"?

UNIT-I

Q2 (a) Discuss Bresenham's approach for scan converting a line. **(6)**
(b) Compute the intermediate points from (0,0) to (5,10) on a line using Bresenham's approach. **(6.5)**

Q3 (a) Discuss Midpoint subdivision line clipping algorithm with example. **(6)**
(b) Discuss Conceptual Framework for interactive graphics. **(6.5)**

UNIT-II

Q4 (a) Discuss various basic 2D transformations in detail with their matrices. **(6)**
(b) What is the need of representing transformations as Homogeneous coordinates? List various basic transformation matrices after conversion to Homogeneous coordinates? **(6.5)**

Q5 (a) Discuss Window to Viewport transformation in detail. **(6)**
(b) Reflect the triangular polygon whose vertices are A(-1,0), B(0,-2) and C(1,0) about the line Y = X + 2. **(6.5)**

UNIT-III

Q6 (a) What are various methods for Polygon Mesh representation? **(6)**
(b) What do you mean by Blending function? Prove that the blending function of open uniform B Spline is equal to that of Bezier curve for d = n+1 (where n is number of control points and d is degree). **(6.5)**

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Q7 (a) Draw a Beizer curve with respect to control points p(1,3),q(2,4),r(5,5),s(7,3) and draw it's Covex hull. **(6)**

(b) Discuss and differentiate various parametric and geometric continuity conditions in detail. **(6.5)**

UNIT-IV

Q8 (a) Discuss and differentiate Object space and Image space methods for hidden surface removal with examples. **(6)**

(b) Discuss various types of Orthographic projections. **(6.5)**

Q9 (a) Explain Depth Sorting method of Hidden surface removal in detail. **(6)**

(b) Discuss three dimensional Cohen Sutherland Clipping in detail. **(6.5)**

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