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Paper Id: 110264 Roll No.

B.TECH.
(SEM VI) THEORY EXAMINATION, 2018-19
COMPUTER GRAPHICS

Time: 3 Hours *Total Marks: 70*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 7 = 14**

(a) What are the applications of Computer graphics?
(b) How many clippers are used by Sutherland Hodgeman for polygon clipping?
(c) Define aspect ratio and types of retracing?
(d) What is Tilting Transformation? Does the order of performing the rotation matter?
(e) What do you understand by match band effect and transparency?
(f) Explain other transformations that can be applied on 2D objects?
(g) Define Blobby objects and types of coherence.

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

(a) Why do we need Video Controller? Also define the architecture of Raster Scan System?
(b) Translate the square ABCD whose co-ordinates are A(0,0), B(3,0), C(3,3) and D(0,3) by 2 units in both directions and then scale it by 1.5 units in x-direction and 0.5 units in y-direction.
(c) Write rotation matrices about X-axis, Y-axis and Z-axis and prove that for any rotation matrix R:- $R^{-1}(\theta)=R(-\theta)=R^{T}(\theta)$
(d) Discuss RGB and CMY color model in detail.
(e) Explain the True-Curve Generation algorithm. Also list the problems in this algorithm.

SECTION C

3. Attempt any *one* part of the following: **7 x 1 = 7**

(a) What are the disadvantages of DDA algorithm? Also write Bresenham's Line Drawing algorithm for negative slope.
(b) Write Mid-Point Circle algorithm and predict the pixels in any octant of circle for radius =12 pixels with its centre at origin?

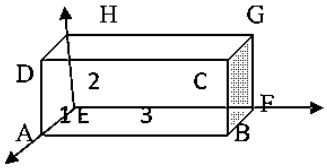
4. Attempt any *one* part of the following: **7 x 1 = 7**

(a) Write the Liang Barsky algorithm for Line Clipping. Use Liang Barsky Line Clipping algorithm to clip the line P1(-1,7) to P2(11,1) against the window having diagonally opposite corners as (1,2) and (9,8).
(b) Explain Window-to-Viewport transformation in detail.

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5. Attempt any *one* part of the following: **7 x 1 = 7**

(a) A rectangular parallelepiped is given having length on X-axis, Y-axis and Z-axis as 3, 2 and 1 respectively. First apply a rotation of -90° about the Y-axis followed by a rotation of 90° about X-axis.



(b) What do you understand by Projection? Differentiate between Parallel Projection and Perspective Projection.

6. Attempt any *one* part of the following: **7 x 1 = 7**

(a) Construct the Bezier Curve of order 3 and with 4 polygon vertices A(1,1), B(2,3), C(4,3), D(6,4).

(b) Write the properties of B-Spline curves. Also write advantages of B-Spline curves over Bezier curves.

7. Attempt any *one* part of the following: **7 x 1 = 7**

(a) Explain Depth buffer method and compare it with A-buffer method.

(b) Why is Gouraud shading also referred to as interpolation shading? Also discuss its advantages and disadvantages?

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