B.E. (Computer Engineering) Fifth Semester (C.B.S.)

Computer Graphics

P. Pages : 2 **TKN/KS/16/7451**

Time : Three Hours * 1 0 1 5 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2
3. Solve Question 3 OR Questions No. 4
4. Solve Question 5 OR Questions No. 6
5. Solve Question 7 OR Questions No. 8
6. Solve Question 9 OR Questions No. 10
7. Solve Question 11 OR Questions No. 12
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.
10. Due credit will be given to neatness and adequate dimensions.

1. a) Explain frame buffer in detail. **4**

b) What is the basic architecture of Raster refresh graphics display ? **5**

c) Rasterize a line $\frac{x}{2}+\frac{y}{10}=1$ using DDA line drawing algorithm. **5**

OR

2. a) Define and differentiate between random scan and raster scan display devices. **4**

b) What do you mean by Aliasing ? State and explain different methods for antialiasing. **5**

c) Write Bresenham's algorithm for drawing a circle in first quadrant in clockwise direction. **5**

3. a) Fill the polygon having vertices H(1, 1), I(3, 3), J(5, 3), K(7, 1), L(7, 7), M(5, 5), N(3, 5) and O(1, 7) using : **8**
i) Edge fill algorithm.
ii) Fence fill algorithm.

b) Write short note on Display file interpreter. **5**

OR

4. a) A polygon is defined by the vertices $P_1(1, 3)$, $P_2(5, 3)$, $P_3(7, 5)$, $P_4(5, 7)$, $P_5(1, 7)$. Apply seed fill algorithm to fill the polygon. Let seed pixel be (3, 4). **8**

b) What is the use of Normalized - Device co-ordinates ? Explain with suitable example. **5**

5. a) What is segment ? Explain various operations that can be performed on segment. **6**

b) A polygon is defined by the vertices A(1, 1), B(11, 1) and C(6, 6). Clip a line from $P_1(0, 2)$ to $P_2(10, 5)$ about the polygonal window using Cyrus - Beck algorithm. **7**

OR

6. a) Differentiate between window and viewport. **5**

b) Explain Midpoint subdivision line clipping algorithm. Clip a line A(-10, 40) and B(30, -20) against a window defined by the co-ordinates (0, 50), (50, 0), (50, 50), (0, 0) using midpoint subdivision algorithm. **8**

7. a) Derive the transformation matrix for rotation about the arbitrary axis in 3D. **6**

b) Differentiate between parallel and perspective projection. Derive the matrix for both. **7**

OR

8. a) Show that the rotation about origin by 270^o is equivalent to reflection about 2 standard axis. **6**

b) Find the reflection of a triangle defined by the vertices A(1, 1), B(5, 1) and C(1, 5) about the line $y = 3x + 10$. **7**

9. a) Explain the Z-Buffer algorithm with its advantages and disadvantages. **7**

b) Explain the process of priority assignment in Painter's algorithm. **6**

OR

10. a) What is interpolation ? Explain different methods of interpolation. **6**

b) Explain Bezier curve with an example. State its properties. **7**

11. a) List & explain the properties of light. **5**

b) Write short notes on : **9**

i) RGB color model.

ii) CMY Color Model.

iii) Chromaticity Diagram.

OR

12. a) What is animation ? List & explain the steps used in design of animation sequences. **7**

b) Write short notes on : **7**

i) Animation functions.

ii) Key - Frame systems.

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