B.E. Fifth Semester (Information Technology) (C.B.S.)

# Computer Graphics

P. Pages : 2 **NKT/KS/17/7357**

Time : Three Hours * 0 0 7 1 * Max. Marks : 80

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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. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

**1.** a) Explain general requirements for line drawing algorithms. **6**

b) Rasterize a line from (-3, 3) to (8, -4) using Bresenham's line generation algorithm. Also explain disadvantages of the algorithm. **8**

**OR**

**2.** a) What do you mean by aliasing? State and explain different methods for anti aliasing. **6**

b) Explain shadows mask CRT. **5**

c) Explain frame Buffer in detail. **3**

**3.** a) Fill a polygon defined by the vertices. **7**
$A(3,2)$ $B(7,2)$ $C(9,5)$ $D(9,7)$ $E(5,9)$ $F(1,7)$ $G(1,5)$
by simple ordered edge list algorithm.

b) Find reflection of a triangle whose vertices are A (1, 1), B (5, 1), C (1, 5) about line $Y = 2x + 10$ **6**

**OR**

**4.** a) Write short notes on : **6**

i) Display file Interpreter.

ii) Display file structure.

b) A polygon is defined by vertices $P_1(1,2)$ $P_2(4,5)$ $P_3(7,2)$ $P_4(7,5)$ $P_5(4,8)$ $P_6(1,5)$ **7**
Fill this polygon using fence fill algorithm.

**5.** a) Write an algorithm for opening & closing a segment. **6**

b) A polygon is defined by following vertices $V_1(3,0)$ $V_2(1,2)$ $V_3(1,4)$ $V_4(3,6)$ $V_5(5,4)$ $V_6(5,2)$. Clip a line $P_1(-2,1)$ to $P_2(6,3)$ about the given polygonal window using Cyrus Beck algorithm. **8**

**OR**

**6.** a) Explain viewing transformation with its matrix. **5**

b) Find the normalized transformation of a window whose lower left corner at (0, 0) and upper right corner (4, 3) onto normalized device screen so that aspect ratio are preserved. **5**

c) Explain the structure of the segment table with example. **4**

**7.** a) Explain 3 D transformation and state 3 D rotational transformation matrix. **5**

b) Write short note on : **8**

a) Z - buffer algorithm

b) Warnock's algorithm

**OR**

**8.** a) Explain different types of projections. Obtain their respective projection matrices. **8**

b) Explain Painter's algorithm to remove hidden surface. **5**

**9.** a) Construct enough points on the Bezier curve where central points are $P_0(4,2)$ $P_1(8,8)$ and $P_2(16,4)$ to draw the accurate sketch? What are the co-ordinates at $u = 0.5$. **7**

b) State and explain the basic properties of B - spline curves. **6**

**OR**

**10.** a) What are the methods of interpolation? Explain them in brief. **5**

b) Explain different surface rendering methods. **8**

**11.** a) Explain RGB CMY and CMYK color model in detail. **8**

b) Explain various Animation tools used in Computer Graphics Animation system. **5**

**OR**

**12.** a) Explain CIE Chromaticity Diagram. **6**

b) How Conversion of RGB to CMY and HSV to RGB takes place in color models? **4**

c) Explain Raster Animation. **3**

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