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

Computer Graphics

P. Pages : 2 **NKT/KS/17/7363**

Time : Three Hours * 0 0 6 2 * 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. Use of non programmable calculator is permitted.

1. a) What do you mean by "Incremental Method" of line generation? State the characteristics of a good line drawing algorithm. **6**

b) Explain the significance of error term associated with the Bresenham's line drawing algorithm. Also generate a line Y = X + 5. Using the algorithm. **8**

OR

2. a) Explain different types of display devices in detail. **9**

b) Compare DDA and Bresenham's line algorithms. **2**

c) Explain Non-interlaced scanning. **3**

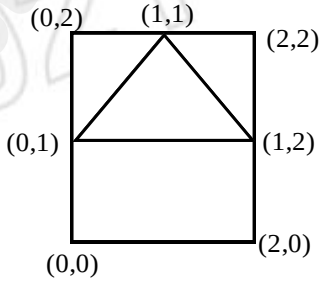
3. a) A polygon is defined by following vertices $P_1(1,1)$ $P_2(1,8)$ $P_3(4,4)$ $P_4(9,6)$ $P_5(9,1)$. Fill this polygon by following methods **any two.** **10**

i) Simple Ordered edge list algorithm.
ii) Edge fill algorithm.
iii) Fence fill algorithm.

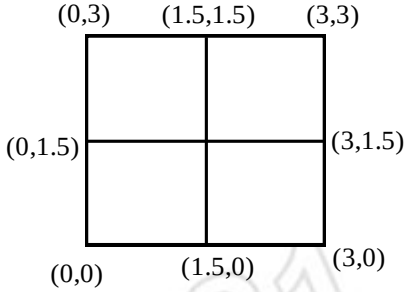
b) Explain display file interpreter. **3**

OR

4. a) Write the program fragment to draw the following figure using REL and ABS command. **8**



(1)



(2)

b) Write short note on normalized device Co-ordinates. Derive the matrix. **5**

5. a) What is a segment and operations performed on a segment? Also explain the concept of segment table. **7**

b) Find a normalized transformation that maps. a window defined by the coordinates lower left (0,0) to (5,5). Upper right. **7**
a) Viewport that is normalized device screen.
b) View port that has lower left corner at (1,1) and upper right at (2,2).

OR

6. a) Explain Cohen- Sutherland Subdivision line clipping algorithm with suitable example. **5**

b) A polygon is defined by following vertices **7.**
$V_1(1,0)$ $V_2(0,1)$ $V_3(0,2)$ $V_4(1,4)$ $V_5(2,3)$ $V_6(4,3)$ $V_7(4,1)$ $V_8(2,0)$.
Clip a line from $P_2(-2,1)$ to $P_2(4,3)$ about the above polygon window using Cyrus Beck algorithm.

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

b) Explain shearing transformation in detail. **4**

c) Explain Isometric projection. **4**

OR

8. a) Explain parallel and perspective projection. **6**

b) Find the reflection of a diamond shaped polygon whose vertices are **7**
$A(-1,0)$ $B(0,-2)$ $C(1,0)$ and $D(0,2)$ about the line Y = X + 2.

9. a) Explain how to draw Beerier curves. **6**

b) Explain Warnock's hidden surface removal algorithm. **7**

OR

10. a) What are the methods of interpolation? Explain in brief. **6**

b) Write short notes on **any two.** **4+3**
i) B - Spline curve.
ii) Gouraud shading.
iii) Fast shading.

11. a) Explain Animation function and language used in 3D graphics. **6**

b) Explain in detail chromaticity diagram. **7**

OR

12. Write short notes on **any three.** **13**
i) Color models.
ii) Key-frame system.
iii) Motion specification.
iv) Properties of light.

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