

PMM/KS/15/7092

**B.E. (Computer Technology) VI Semester
(C.B.S.) Examination
COMPUTER GRAPHICS**

Time : Three Hours]

[Maximum Marks : 80

Note : 1. All questions carry marks as indicated.

2. Solve six questions as follows:

Que. No. 1 OR Que. No. 2

Que. No. 3 OR Que. No. 4

Que. No. 5 OR Que. No. 6

Que. No. 7 OR Que. No. 8

Que. No. 9 OR Que. No. 10

Que. No. 11 OR Que. No. 12

3. Due credit will be given to neatness and adequate dimensions.

4. Illustrate your answers with necessary figures/drawings wherever necessary.

1. a) Describe the frame buffer architecture. 5
b) Write short notes on (Any two) 8
i) DVST
ii) Calligraphic refresh graphics display
iii) Raster refresh graphics display

OR

2. a) Explain Interlaced scanning in raster scan display. 4
- b) Explain the following terms 6
- i) Refresh rate
 - ii) Vertical sweep frequency
 - iii) Horizontal sweep frequency
 - iv) Vertical scan time
 - v) Double buffering
 - vi) Horizontal scan time
- c) Find the time required for each pixel to display if there are 525 scan lines and 644 pixels/scan line. 3
3. a) Rasterize a line for the equation $y = 2x + 10$ using DDA algorithm. 5
- b) Generate an arc in the first quadrant in clockwise direction with center at origin and radius = 8. 6
- c) What is antialiasing? Explain various methods of antialiasing. 3

OR

4. a) Write a generalized Bresenham's line drawing algorithm for all the quadrants. Rasterize a line from (0, 0) to (-8, -4) using this algorithm. 5
- b) A polygon is defined by the vertices (1, 1), (8, 1), (8, 6), (5, 3), (1, 7) fill this polygon using ordered edge list algorithm. 6

- c) What is Halftoning ? Explain Halftoning techniques. 3
5. a) Clip a line with two points $P_1(-3/2, 1/6)$ and $P_2(1/2, 3/2)$ against a polygon window with points A(-1, -1), B(1, -1), C(1, 1) and D(-1, 1) using Cohen-Sutherland outcode line clipping algorithm. 7
- b) Explain sutherland Hodgman polygon clipping algorithm with example. 6
- OR
6. a) Write short note on 6
- i) Bezier curve
- ii) B-splines curve
- b) A polygon having a vertices (0, 0), (8, 0), (8, 4), (0, 4) clip a line $P_1(-2, 2), P_2(7, 5)$ about the given polygon window using cyrus beck algorithm. 7
7. a) Scale a triangle defined by the vertices A(1, 1), B(2, 2), C(6, 3) to twice its size and then rotate it by 90° in clockwise direction keeping vertex C invariant. 7
- b) Reflect a triangle A(10, 10), B(50, 10), C(20, 50) about the axis $y = 2x + 10$. 5
- c) What do you mean by 'Concatenation' How is it achieved? 2

OR

8. a) What is Homogeneous coordinate system? 3
b) Find normalization transformation from the window where lower left corner at (0, 0) and upper right corner at (4, 3) onto the normalized device screen so that aspect ratio is preserved. 6
c) What is viewing transformation? Obtain the matrix for viewing transformation. 5
9. a) Explain the perspective projection technique. 4
b) Explain 3D Rotation and state 3D rotational transformation matrices. 4
c) Explain the working of Warnock's algorithm. 5

OR

10. a) Explain painters algorithm. 7
b) Explain parallel projection technique. 6
11. a) Why should use open GL? 6
b) Explain features of open GL. 7

OR

12. a) How are coordinates transformed in open GL? 6
b) Explain 3D viewing pipeline in Open GL. 7

