

2026

6th Semester Examination (CCFUP : NEP)

COMPUTER SCIENCE

Paper : MJ 12-T

(Single Core Major)

(Computer Graphics)



Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any *five* questions : $2 \times 5 = 10$

1. Define antialiasing.
2. Perform a 30° rotation of a triangle A(2,2), B(3,3) and C(6,5) about a point P(-8,-5).
3. Write down the steps of Z-buffer Algorithm.
4. Distinguish between window and viewport.
5. What do you mean by MIDI?
6. Define projection and mention its importance.

P.T.O.

(2)

7. Compare and contrast the Boundary Fill Algorithm and Flood Fill Algorithm.

8. Define random and raster scanning.

Group - B

Answer any *four* questions :

$$5 \times 4 = 20$$

9. Derive the transformation matrix for perspective projection.

10. Explain the reflection of a 2D figure on $y = mx + c$.
Derive its component matrix. $3+2$

11. What do you mean by staircase effect? How does the staircase effect affect the generation of graphics primitives? What was the proposed solution to this effect? $2+2+1$

12. (a) A raster scan display processor supports a resolution of 1024×800 with up to 16 million colours simultaneously displayable. What will be the approximate size (in bytes) of the frame buffer used in the display processor?

(b) In Bresenham's circle algorithm, if points are generated from 90° to 45° and (x, y) are the coordinates of the last scan converted pixel then what will be the next pixel coordinate? $3+2$

13. (a) Why are homogeneous coordinates used for transformation computations in Computer Graphics?

(3)

13. (b) Show how reflections in the line $y = x$ and in the line $y = -x$ can be performed by a scaling operation followed by a rotation. $2+3$

14. Using mid-point circle drawing algorithm, how a circle with radius of 8 units.

Group - C

Answer any *one* question :

$$10 \times 1 = 10$$

15. (a) Suppose a window has its lowest corner at $(-3, -2)$ and its upper right corner at $(4, 2)$. Find the visible portion of the line joining points $(-4, 2)$ and $(3, 5)$ using Cohen-Sutherland Line Clipping algorithm.

(b) Write and explain Sutherland-Hodgeman algorithm to clip a polygon. $5+5$

16. Write short notes on (any *four*) :

$$2\frac{1}{2} \times 4 = 10$$

(a) Phong's Shading Model

(b) CRT

(c) Digital Differential Analyzer

(d) Area Coherence Algorithm

(e) Mid-point Ellipse Drawing Algorithm

(f) Morphing

