

M.Sc. (Part-II) Semester-III (CBCS) Examination
COMPUTER SCIENCE
(Computer Graphics)
Paper-3 MCS 2

Time : Three Hours]

[Maximum Marks : 80

Note :—(1) All questions are compulsory.

(2) Use suitable data wherever necessary.

(3) Illustrate your answer with the help of neat sketches wherever necessary.

1. (a) Write and explain Bresenham's algorithm for generation of line segment. 13
- (b) Give the general form for the equation of the line passing through following pair of points :
 - (i) (1, 0) and (7, 2)
 - (ii) (2, 3) and (4, 2) 2

OR

2. (a) Explain the following display devices :
 - (i) Raster Display
 - (ii) Plotter
 - (iii) DVST
 - (iv) Plasma Panel
 - (v) Liquid Crystal Display
 - (vi) Vector Refresh Display. 12
- (b) For the following pairs of lines, state whether they intersect or not. If they do, give the coordinates of the point of Intersection :
 - (i) $y = x$ and $y = 2x + 6$
 - (ii) $y = x + 4$ and $y = 2x + 6$ 3
3. (a) What is the need of Homogeneous co-ordinates system ? Explain in detail. 6
- (b) What is polygon ? Explain with example convex and concave polygon. 3
- (c) What is Scaling Transformation ? Explain with example. 4

OR

4. (a) Write an algorithm FILL-POLYGON (INDEX) to fill the polygon using scan-line method. 8
- (b) Explain in detail Scaling Transformation by giving example. 5

5. (a) Derive and explain viewing transformation matrix. 7
(b) Write an algorithm CREATE-SEGMENT (SEGMENT-NAME) to create a named segment. 6

OR

6. (a) Explain in detail the Cohen-Sutherland out code algorithm for clipping lines. 6
(b) What is Segment ? Explain the concept of Segment Table. 7
7. What is Perspective Projection in 3D ? Derive the Perspective Projection matrix in 3D. 13

OR

8. (a) Explain in detail simulating a pick with a locator. 7
(b) What is Interaction ? Explain the following Interactive devices :
(i) Thumb wheels
(ii) Joystick
(iii) Tablet. 6
9. (a) What is meant by Z buffers ? What is the need of Z buffers ? Explain in detail. 7
(b) Explain in detail Franklin algorithm. 6

OR

10. (a) Explain in detail the concept of Hidden-Line method. 8
(b) Explain the minimax test for comparison. 5
11. (a) Write the algorithm ARCCDDA (X₀, Y₀, A, X, Y, INTENSITY) for generation of circular arc in counter-clock wise direction. 7
(b) Explain the concept of Ray Tracing. 6

OR

12. (a) What is Shadows ? Explain the concept in detail. 7
(b) Explain different colour models. 6