

**2020**

**COMPUTER SCIENCE — GENERAL**

**Paper : DSE-A-3**

**(Computer Graphics)**

**Full Marks : 50**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**Day 1**

Answer **question no. 1** and **any four** from the rest.

1. Answer **any five** questions : 2×5
- (a) Define : Pixel.
  - (b) Define window port and view port in computer graphics.
  - (c) What is line clipping?
  - (d) Write down properties of a CRT monitor.
  - (e) Define scan conversion in computer graphics.
  - (f) How scaling factors affect transformation of an object in 2D?
  - (g) Write two-dimensional shearing matrix about x-axis and y-axis
2. (a) Write down the differences between Raster scan and Vector scan techniques.
- (b) What are the advantages of using homogeneous co-ordinate system in two-dimensional transformation?
- (c) Determine the composite transformation matrix for reflection about straight line  $y = 3x$ . 3+3+4
3. (a) Rotate a triangle with vertices (10, 20), (10, 10) and (20, 10) about the origin by  $30^\circ$ . Find the new co-ordinates of the triangle.
- (b) Define projection in computer graphics. Differentiate between parallel projection and perspective projection. 5+(2+3)
4. (a) Explain the working principle of Bresenham's line drawing algorithm.
- (b) Discuss about different types of parallel projections. 5+5
5. (a) Explain the working principle of Digital Differential Analyzer (DDA) line drawing algorithm.
- (b) What are the disadvantages of DDA algorithm?
- (c) Mention the steps to design an animation sequence. 5+2+3

**Please Turn Over**

6. (a) Explain the working principle of Cohen-Sutherland line clipping algorithm.
- (b) Apply Cohen-Sutherland line clipping algorithm to clip the line segment with co-ordinates (3, 6) and (10, 10) against the rectangular window with co-ordinates (1, 2), (8, 2), (1, 5) and (8, 5). 5+5
7. (a) Write a short note on morphing.
- (b) Discuss Sutherland-Hodgeman polygon clipping algorithm with an example.
- (c) What is the difference between monochrome and color monitor? 3+5+2
8. (a) Define computer art.
- (b) Prove that, composition of two rotation transformations in 2-D are additive.
- (c) Find plotted pixels of straight line A(3, 2), B(11, 4) using Bresenham's line drawing algorithm. 2+3+5
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