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Total No. of Printed Pages: 1

Total No. of Questions: [09]

BCA (Semester – 6th)
COMPUTER GRAPHICS
Subject Code: BCAP1627
Paper ID: [160127]

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(2 marks each)

- Q1. Attempt the following:
- a) Define aspect ratio?
 - b) What are graphics primitives? Give two examples.
 - c) List and briefly describe four key application areas of computer graphics.
 - d) What are the limitations of using the direct line equation method for line drawing?
 - e) What is the concept of Mid-Point in Mid-Point Circle Algorithm?
 - f) What is the difference between the Boundary Fill and Flood Fill algorithms?
 - g) What are homogeneous coordinates, and why are they used in transformations?
 - h) What are composite transformations?
 - i) What is the viewing coordinate reference frame in 2D viewing?
 - j) Define the terms window and viewport in 2D viewing.

Section – B

(5 marks each)

- Q2. Explain the concept of raster-scan systems. Also compare Raster Scan and Random Scan displays?
- Q3. Write and explain the steps involved in Bresenham's line drawing algorithm. Also, discuss its advantages and limitations.
- Q4. Perform a 45-degree rotation of a triangle with vertices A (0, 0), B (1, 1), C (5, 2). About (a) the origin (b) about point P (-1, -1).
- Q5. What is filling? Write down the code for 8-connected boundary_fill method.
- Q6. What is viewing pipeline? Drive the equations and matrix for 2-D viewing transformation?

Section – C

(10 marks each)

- Q7. What are video-display devices? Explain the working of Cathode Ray Tubes in detail.
- Q8. Describe the mathematical representations of translation, scaling, rotation, reflection, and shear transformations in 2D computer graphics. How these transformations are represented using 3x3 matrices?
- Q9. Explain the concept of Cohen Sutherland line clipping algorithm in computer graphics. Provide a step-by-step explanation of how the algorithm works.