

A

(20123)

Roll No.

B. Sc. (Hons.) (Com. Sc.)-V Sem.

NS-3374

B. Sc. Hons. Examination, Dec. 2022

COMPUTER SCIENCE

Interactive Computer Graphics and Multimedia

(BHCS-501)



Time : Three Hours]

[Maximum Marks : 75

Note : Attempt questions from all Sections as per instructions.

Section-A

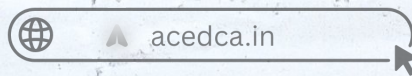
(Very Short Answer Type Questions)

Attempt all the *five* question. Each question carries 3 marks. Very short answer is required not exceeding 75 words.

$3 \times 5 = 15$

(2)

1. Differentiate between Raster Scan and Random Scan monitors.
2. Define clipping and its operation. Write an algorithm for line clipping.
3. Differentiate between parallel projection and perspective projection.
4. Define 2D scaling along with its matrix representation.
5. If a point (4, 5) is rotated counter clockwise at an angle of 45° . Find its rotation matrix and resultant point.



Section-B

(Short Answer Type Questions)

Attempt any *two* questions out of the following three questions. Each question carries $7\frac{1}{2}$ marks. Short answer is required not exceeding 200 words.

$$7\frac{1}{2} \times 2 = 15$$

(3)

6. Define transformation. Describe in matrix formulation of 2D translation, scaling and rotation.
7. A triangle is having vertices A(1, 2), B(6, 2) and C(5, 3) is given. Taking B as fixed reference point scale the size of the triangle so that it become double in X-direction and triple in Y-direction. Find the final vertices of the triangle.
8. State Bresenham's circle drawing algorithm and use it to draw the quadrant of a circle with centre as (0, 0) and radius 6 c.m.

Section-C

(Detailed Answer Type Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks.

Answer is required in detail.

15×3=45

9. Define window-to-view point transformation and derive the transformation matrices.
10. Explain, how the Bezier curve with four control points is determined and also state and prove the property of Bezier curve.

(4)

11. What is composite transformation ? Apply the shearing transformation to square with $A(0, 0)$, $B(1, 0)$, $C(1, 1)$ and $D(0, 1)$ as given below :
- (a) Shear parameter = 0.5 relative to line $Y = -1$
 - (b) Shear parameter = 0.5 relative to line $X = -1$.
12. Why the hidden surface needs removal ? Discuss the z-buffer method for removal of hidden surface.
13. Explain  Phong and Gouraud shading. Apply Cohen Sutherland algorithm to clip two lines AB and CD with point coordinates $A(40, 15)$, $B(75, 45)$ and $C(70, 20)$, $D(100, 10)$ against a window $P(50, 10)$, $Q(80, 10)$, $R(80, 40)$ and $S(50, 40)$.