BCA Semester-IV (Hons.) Examination, 2022-23

BACHELOR OF COMPUTER APPLICATION

Course ID : 43312 **Course Code : CC-09**

Course Title : Computer Graphics and Multimedia

Time : 2 Hours Full Marks : 50

The figures in the right-hand margin indicate marks.

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

Illustrate the answers wherever necessary.

GROUP–A

1. Choose the best alternative from the following options for each questions: 1×10=10

a) Smallest size object that can be displayed on a monitor is called

i) Colour

ii) Point

iii) Dot pitch

iv) Aspect ratio

v) None of these

b) The basic transformations include

i) Translation

ii) Rotation

iii) Scaling

iv) All of above

v) None of these

c) The process of extracting a portion of a picture inside or outside a specified region are called

i) Transformation

ii) Projection

iii) Clipping

iv) Mapping

v) None of these

d) The rectangle portion of the interface window that defines where the image will actually appear are called

i) Transformation viewing

ii) View Port

iii) Clipping window

iv) Screen coordinate system

v) None of these

e) The region code of a point within the clipping window is

i) 1111

ii) 1001

iii) 1000

iv) 0001

v) None of these

f) CMYK model are used for

i) Computer display

ii) Printing

iii) Painting

iv) All of above

v) None of these

g) Which of the following is drawn using 8 mirror images?

i) Parabola

ii) Ellipse

iii) Hyperbola

iv) Circle

v) None of these

h) If an object is rotated through an angle A in clockwise direction, the rotation matrix R = _____.

i) $\begin{bmatrix} \cos A & \sin A \\ -\sin A & \cos A \end{bmatrix}$

ii) $\begin{bmatrix} \cos A & -\sin A \\ \sin A & \cos A \end{bmatrix}$

iii) $\begin{bmatrix} \sin A & \cos A \\ \cos A & \sin A \end{bmatrix}$

iv) $\begin{bmatrix} -\sin A & \cos A \\ \cos A & \sin A \end{bmatrix}$

v) None of these

i) Reflection of a point about x-axis, followed by a counter-clockwise rotation of 90°, is equivalent to reflection about the line?

i) $x = -y$

ii) $x = 0$

iii) $x = y$

iv) $x + y = 1$

v) None of these

j) The transformation in which the dimension of an object are changed relative to a specified fixed point is called

i) Rotation

ii) Reflection

iii) Translation

iv) Scaling

v) None of these

GROUP–B

2. Answer any **five** questions: 2×5=10

a) What do you mean by eight-connected method in fill-area algorithm?

b) What is shadow-mask method?

c) What do you mean by horizontal retrace and vertical retrace for displaying an object?

d) What is world coordinate?

e) What do you mean by stereoscopic view?

f) Explain the need of inside outside test.

g) What is shear?

h) What do you mean by composite transformation?

GROUP–C

3. Answer any **four** questions: 5×4=20

a) Perform a 45° rotation for a polygon (–2, –4), (6, –1), (6, 5), (0, 8), (–5, 3) about a point (0, 0). 5

b) Given a square whose two end points are (0, 0) and (6, 6). Now apply reflection about x = y line onto x axis, for the four corner of the given square. 5

c) Explain the purpose of region code used in Cohen-Sutherland line clipping algorithm and how does it works? 5

d) Given two endpoints (5, 6) and (9, 10) for a straight line. Implement a suitable line drawing algorithm to find the pixel point to draw the line. 5

e) Find the basic difference between boundary fill and flood fill algorithm. Explain the odd-parity rule for inside outside test of a point. 2+3

f) Perform 3D translation transformation for the point (3, 4, 7) where the given translation distance $D_x = 4$, $D_y = 2$, $D_z = 3$ using three dimensional homogeneous matrix representation. 5

GROUP–D

4. Answer any **one** question: 10×1=10

   a) Differentiate between Raster Scan and Random Scan Display. Explain advantages and disadvantages of both of them. 4+(3+3)

   b) Write short note on (any **two**): 5×2=10

      i) CYMK colour model

      ii) Bezier curves

      iii) Back face detection

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