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(5th Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No : BCA–502

(Computer Graphics and Multimedia)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(*Marks* : 50)

*The figures in the margin indicate full marks
for the questions*

1. *(a)* List the operating characteristics for the following display technologies :

   Raster refresh systems, Vector refresh systems, Plasma panels and LCD's   10

   Or

   (b) List the different input and output components that are typically used with virtual reality systems. Also explain how users interact with a virtual scene displayed with different output devices, such as two-dimensional and stereoscopic monitors.   10

(2)

2. (a) What is transformation? Prove that the multiplication matrices for each of the following sequence of operations is cumulative : 10
   (i) Two successive translations
   (ii) Two successive rotations

   Or

   (b) Implement the Cohen-Sutherland line-clipping algorithm. 10

3. (a) Set up a procedure for a parallel implementation of the midpoint circle algorithm. 10

   Or

   (b) Implement the setpixel routine in Bresenham's line algorithm using iterative techniques for calculating frame-buffer addresses. 10

4. (a) Describe the properties of B-spline curves. 6

   (b) Write a short note on B-spline surfaces. 4

   Or

   (c) Explain the different types of quadric surfaces. 6

   (d) Write a short note on Bezier curves. 4

5. *(a)* Explain the applications of multimedia.   6

    (b) State the advantages and disadvantages of MIDI.   4

Or

    (c) Describe the principles of animation.   6

    (d) Write a short note on digital audio.   4

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(5th Semester)

BACHELOR OF COMPUTER APPLICATION

Paper No : BCA–502

(Computer Graphics and Multimedia)

(PART : A—OBJECTIVE)

(*Marks* : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(*Marks* : 15)

1. Tick (✓) the correct answer in the brackets provided :

$1 \times 10 = 10$

    (a) The phrase 'computer graphics' was first coined by

       (i) William Fetter in 1960 (✓)

       (ii) James Gosling in 1991 ( )

       (iii) John Taylor in 1980 ( )

       (iv) James Fetter in 1969 ( )

(b) Types of computer graphics are

    (i)   scalar and raster   (   )

    (ii) vector and scalar   (   )

    (iii) vector and raster   (   )

    (iv) None of the above   (   )

(c) According to Cohen-Sutherland algorithm, a line is completely outside the window, if

    (i)   the endpoints region code are non-zero values   (   )

    (ii) L-bit and R-bit are non-zeros   (   )

    (iii) the region codes of line endpoints have a '1' in same bit position   (   )

    (iv) the region codes of line endpoints have a '0' in same bit position   (   )

(d) An octree is a data structure which is used for alternative representation of

    (i)   2D digital picture or object   (   )

    (ii) 3D picture or object   (   )

    (iii) Both (i) and (ii)   (   )

    (iv) None of the above   (   )

(e) ____ is accomplished by calculating intermediate positions along the line path between two specified endpoints.

    (i)   Point plotting   (   )

    (ii) Vector   (   )

    (iii) Both (i) and (ii)   (   )

    (iv) Line drawing   (   )

(f) The Cartesian slope-intercept equation for a straight line is

    (i) $y = m . x + b$ (   )

    (ii) $y = m(x) + b$ (   )

    (iii) $x = m . y + a$ (   )

    (iv) $x = m(y) + a$ (   )

(g) ____ is created by revolution of a circle about an axis lying in its plane.

    (i)   Sphere   (   )

    (ii) Ellipsoid   (   )

    (iii) Torus   (   )

    (iv) Cylinder   (   )

(h) _____ is known as standard graphics objects.

    (i) Octree   (   )

    (ii) Quadtree   (   )

    (iii) Polygon surface   (   )

    (iv) Ellipsoid   (   )

(i) _____ is a combination of text, graphic art, sound, animation and video delivered to you by computer or other electronic means.

    (i) Hypermedia   (   )

    (ii) Electronic encyclopedia   (   )

    (iii) Multimedia   (   )

    (iv) Video conferencing   (   )

(j) Which of the following is not a television signal format?

    (i) NTSC   (   )

    (ii) MPEG   (   )

    (iii) PAL   (   )

    (iv) SECAM   (   )

(5)

2. State whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark :   1×5=5

(a) Persistence is defined as the time it takes the emitted light from the screen to decay to one-tenth of its original intensity.

(T / F)

(b) Expressing positions in homogeneous coordinates allow us to represent all geometric transformation equations as matrix multiplication.

(T / F)

(c) We can adjust the shape of the line ends to give them a better appearance by adding line caps.

(T / F)

(d) Interpolation curves are commonly used as design tools to structure object surfaces.

(T / F)

(e) MIDI is a device independent.

(T / F)

(6)

3. Answer the following questions :   2×5=10

    (a) Explain the two types of computer graphics.

(b) What is perspective projection?

(c) What do you mean by output primitives?

(d) - What is superquadrics?

(e) Explain JPEG and MPEG.

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