2014

(6th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Course No. : 602 (i)

(Computer Graphics)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(*Marks* : 50)

The figures in the margin indicate full marks for the questions

1. *(a)* **What is computer graphics? Explain any four applications of computer graphics.** **2+8=10**

Or

(b) **What is CAD? Explain computer aided design for the following :** **2+8=10**

(i) Animation

(ii) Architecture

(iii) Aeronautics

(iv) Automobile industry

2. *(a)* How does CRT monitor display color pictures? Explain the two basic techniques for producing color display with CRT. 2+4=6

(b) What is animation? Mention any three uses of animation. 1+3=4

Or

(c) Explain the working mechanism of CRT monitor with a neat diagram. 6

(d) Explain midpoint subdivision algorithm. 4

3. *(a)* Find the inverse of the matrix

$$\begin{bmatrix} 3 & 5 & 7 \\ 1 & 3 & 8 \\ 2 & 4 & 9 \end{bmatrix}$$ 5

(b) Explain the following : 2½+2½=5

(i) Polar coordinates

(ii) Parametric representation of a line segment

Or

(c) What do you mean by transformation? Explain translation, rotation and scaling in 2D transformation of an object with a neat diagram. 1+6=7

(d) What is OpenGL? Write the commands to set a color in OpenGL. 1+2=3

4. (a) Write down Bresenham's circle drawing algorithm. 6

(b) What is B-spline curve? Write down the advantages of B-spline curve. 2+2=4

Or

(c) Explain Cohen-Sutherland line clipping algorithm with a neat diagram. 5+1=6

(b) Write short notes on : 2+2=4

(i) Generation of bar chart

(ii) Character generation

5. (a) What is multimedia? Explain the applications of multimedia in—

(i) education;

(ii) video conferencing;

(iii) training;

(iv) entertainment;

(v) electronic encyclopedia. 1+5=6

(b) What do you mean by image compression? Explain the three image compression standards. 1+3=4

Or

(c) What is MIDI? Write the advantages and disadvantages of MIDI. 2+2=4

(d) Differentiate between the following : 2+2+2=6

(i) Analog Audio and Digital Audio

(ii) Hypertext and Hypermedia

(iii) Sound Card and Audio Speaker

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Course No. : 602 (i)

(Computer Graphics)

(PART : A--OBJECTIVE)

(*Marks* : 25)

The figures in the margin indicate full marks for the questions

1. Put a Tick [✓] mark in the brackets provided against the correct answer : 1×10=10

(a) Each two-dimensional position can be represented with the homogeneous coordinate

(i) $(x, y, 1)$ [ ]

(ii) $(x, y, 0)$ [ ]

(iii) (x_h, y_h, h) [ ]

(iv) (x_h, y_h, z_h) [ ]

(b) Magenta color can be produced in shadow-mask method by the combination of

(i) red and green [ ]

(ii) red and blue [ ]

(iii) green and blue [ ]

(iv) red, green and blue [ ]

(c) In Cohen-Sutherland line clipping algorithm, it divides a 2D space into —— regions, of which only the middle part (viewport) is visible.

(i) 4 [ ]

(ii) 8 [ ]

(iii) 6 [ ]

(iv) 9 [ ]

(d) It is a dynamic manipulation technique usually implemented with the help of mouse to move a geometric object in the computer screen. This technique is called

(i) translation [ ]

(ii) dragging [ ]

(iii) zooming [ ]

(iv) panning [ ]

(e) The trigonometry formula of $\tan\theta$ is

(i) opp/hyp [ ]

(ii) adj/hyp [ ]

(iii) adj/opp [ ]

(iv) opp/adj [ ]

(f) Which of the following is a straight path between two points and can be defined by its two endpoints?

(i) Line [ ]

(ii) Line segment [ ]

(iii) Ray [ ]

(iv) None of the above [ ]

(g) $v_1 \times v_2 = u|v_1||v_2|\sin\theta$, where $0 \leq \theta \leq \pi$ and θ is the angle between the two vectors. This is the property of

(i) scalar product [ ]

(ii) cross product [ ]

(iii) dot product [ ]

(iv) inner product [ ]

(h) —— is an aeronautical CAD tool for designing aircraft.

(i) Simulation [ ]

(ii) AutoCAD [ ]

(iii) TurboCAD [ ]

(iv) Win foil [ ]

(i) If two endpoints codes of a line are (1001) and (0101), the line is

(i) totally visible [ ]

(ii) totally invisible [ ]

(iii) partially visible [ ]

(iv) partially invisible [ ]

(j) The process in which you link objects such as hands to arms and define their relationship and limits (e.g., elbows cannot bend backwards), then drag these parts around and let the computer calculate the result is called

(i) kinematic [ ]

(ii) tweening [ ]

(iii) inverse kinematic [ ]

(iv) cel animation [ ]

2. State whether *True* or *False* : 1×5=5

(a) An object seen by the human eye remains chemically mapped on the retina for a brief time after viewing. This phenomenon is called animation.

( )

(b) MIDI is 'Device Independent'.

( )

(c) B-spline curves share many important properties with Bezier curves. But Bezier curves have more desired properties than B-spline curves.

( )

(d) The method of compression used by JPEG is lossy compression while GIF is said to be lossless compression.

( )

(e) The animation technique made famous by Disney involves showing a different image for each frame. This technique is called 'Cel animation'.

( )

3. Answer/Write on the following : 2×5=10

(a) Explain briefly rubber-band method.

(b) BITMAP

(c) Morphing

(d) Scanner

(e) Differentiate between random scan and raster scan display device.

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