



ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE - 2008
COMPUTER GRAPHICS AND MULTIMEDIA
SEMESTER - 6

Time : 3 Hours]

[Full Marks : 70

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) The amount of memory in frame buffer is called

- a) bit plane
- b) plane
- c) bit
- d) none of these.

ii) Tablet is

- a) Logical Interactive Device
- b) Data Generation Device
- c) Physical Interactive Device
- d) None of these.

iii) Bresenham's Algorithm seeks to select the optimum raster locations that represent a

- a) straight line
- b) curve line
- c) polygon
- d) none of these.

iv) Clipping algorithms are

- a) two or three dimensional
- b) two dimensional
- c) three dimensional
- d) none of these.

v) Another name of supersampling is

- a) postfiltering
- b) aliasing
- c) anti-aliasing
- d) none of these.

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vi) According to Simple Area Anti-aliasing, pixel is considered as

- a) a mathematical point
- b) a finite area
- c) an infinite area
- d) none of these.

vii) Under a parallel projection, the point (2, 3, - 1) has been viewed at (3, 3, 0); then the direction of projection should be the vector

- a) (1, 0, 1)
- b) (1, 0, - 1)
- c) (0, 1, 1)
- d) (0, - 1, 1).

viii) The slope of the Bezier curve at the start of the curve is controlled by

- a) first control point
- b) first two control points
- c) first three control points
- d) all four control points.

ix) How many channels are specified by MIDI standards ?

- a) 16
- b) 24
- c) 32
- d) None of these.

x) In which type of compression I-frame is used ?

- a) JPEG
- b) MPEG
- c) GIF
- d) None of these.

GROUP - B

(Short Answer Type Questions)

Answer any three of the following.

3 x 5 = 15

2. Write a pseudocode procedure to implement the boundary-fill algorithm in the text in its basic form using the 4-connected definition for region pixels.
3. Magnify the triangle with vertices A (0, 0), B (2, 2) and C (6, 8) to twice its size while keeping C (5, 2) fixed.
4. What is spline curve ? Describe interpolation and approximation splines.
5. Briefly explain different types of file format used in image compression.
6. Differentiate between spatial redundancy and temporal redundancy.

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GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following.

3 × 15 = 45

- 7. a) Derive the Midpoint Circle drawing algorithm. 8
- b) Given input ellipse parameters $r_x = 8$ and $r_y = 6$, illustrate the steps in the midpoint ellipse algorithm by determining raster positions along the ellipse path in the 1st quadrant. 7
- 8. a) Why is a homogeneous co-ordinate system needed in transformation matrix ? 2
- b) Derive the transformation matrix for rotation about any axis. 5
- c) What do you mean by shearing ? 2
- d) Explain the reflection of a 2D figure on $y = m x + c$. Derive its component matrix. 6
- 9. a) Discuss briefly about the Cohen-Sutherland line clipping algorithm. 8
- b) Suppose a window has its lowest left corner at $(- 2, - 1)$ and its upper right corner at $(3, 2)$. Using Cohen-Sutherland algorithm for line clipping, find the visible portion of the line joining points $(- 3, 1)$. 7
- 10. a) What do you mean by lossless and lossy compressions ? 2 + 2
- b) What do you mean by morphing ? 2
- c) What are hypertext and hypermedia ? What is the relation between multimedia, hypertext and hypermedia ? 1 + 1 + 2
- d) What do you mean by I-frame, B-frame and P-frame in the context of video compression ? 3
- e) What do you mean by masking ? 2
- 11. a) Find the equation of Bezier curve which passes through points $(0, 0)$ and $(- 2, 1)$ and is controlled through points $(7, 5)$ and $(2, 0)$. 4
- b) Explain the term control points. 2
- c) Give details of how Bezier curves are generated. Write the pseudocode for generating Bezier curves. 3 + 3
- d) What do you mean by hidden surface removal ? 3

END

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