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CS/B.TECH(CSE)/SEM-6/CS-603/2012

2012

COMPUTER GRAPHICS AND MULTIMEDIA

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

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

GROUP – A

(Multiple Choice Type Questions)

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

i) Raster means

a) series of parallel lines

b) series of parallel blocks

c) series of parallel medium

d) series of parallel sweeps.

ii) Physical Aspect Ratio is termed as

a) Ratio of width of the frame to its height

b) Ratio of width of pixel to its height

c) Ratio of width of block to its height

d) All of these.

iii) The maximum number of dots that can be displayed without overlap on a CRT is referred to as

a) Refresh Rate b) Interlacing

c) Screen Resolution d) None of these.

iv) Achromatic light is

a) Quantity of light b) Quantity of colour

c) Quantity of darkness d) Quantity of shading.

v) How many channels are specified by MIDI standards ?

a) 16 b) 24

c) 32 d) 48.

vi) The memory area which holds a set intensity values for all the screen points is

a) frame buffer b) refresh RAM

c) video cache d) RAM.

vii) Using odd parity rule, if the number of polygon edges crossed by a line, from a point is odd, then

a) P is an exterior point

b) P is an interior point

c) P is on the edge point

d) odd parity-rule alone is not sufficient to judge.

viii) If S_x and S_y are scaling factors applied in X and Y directions respectively, on $P(x, y)$, the output point co-ordinates after applying scaling operation is

a) $x_1 = 1/x.S_x \ , y_1 = y.S_y$

b) $x_1 = x + S_x \ , y_1 = y + S_y$

c) $x_1 = x.S_x \ , y_1 = 1/y.S_y$

d) $x_1 = x.S_x \ , y_1 = y.S_y$.

ix) Aliasing means

a) rendering effect b) shading effect

c) staircase effect d) cueing effect.

x) Perspective projection is characterised by the

a) view plane alone

b) direction of projection and the view plane

c) centre of projection and the view plane

d) centre of projection alone.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What are the differences between raster scan and vector scan technique ?

3. Perform a 30° rotation of a triangle A (2, 2), B (3, 3), C (6, 5) about

a) the origin

b) a point P (– 8, – 5). 2 + 3

4. Derive mid-point line drawing algorithm.

5. Briefly explain the different types of file format used in image compression.

6. a) What is resolution of an image ?

b) Compute the size of a 640 × 480 image at 240 ppi.

c) What is the relationship between RGB and CMYK colour model ? 1 + 2 + 2

7. Describe how a 3D object is presented on the screen using perspective projection. Take a simple object from illustration.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

8. a) Why is a homogeneous co-ordinate system needed in transformation matrix ?

   b) Derive the transformation matrix for rotation about any axis.

   c) Explain the reflection of a 2D figure on $y = m\,x + c$. Derive its component matrix.

   d) What do you mean by shearing ? 2 + 5 + 6 + 2

9. a) Using mid-point circle drawing algorithm draw a circle with radius of `10 units.

   b) Derive the algorithm of Flood-fill.

   c) What do you mean by hidden surface removal ? 7 + 5 + 3

10. a) Explain the term 'control points'.

    b) What do you mean by hidden surface removal ? Write down the *z*-buffer algorithm.

    c) Define morphing and masking. 3 + 7 + 5

11. a) What is MIDI ? Discuss the advantages of MIDI over digitization. 2 + 3

    b) Describe the method of digitization. 6

    c) What is the difference between :

       i) lossy compression and lossless compression ?

       ii) video and animation ? 4

12. Write short notes on any *three* of the following : 3 × 5

    a) Virtual Reality

    b) MPEG

    c) Projection

    d) Z-buffer algorithm

    e) Painter algorithm

    f) Anti-aliasing.