KUMARAGURU college of technology
character is life

Register Number: ……..

B.E DEGREE EXAMINATIONS: MAY 2015

(Regulation 2009)

Fifth Semester

INFORMATION TECHNOLOGY

CSE109**:** Computer Graphics

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Image processing applications

   a) Creates new pictures b) Improves picture quality

   c) Take photographs d) Take videos

2. Bresenham's line algorithm has

   a) Time consuming rounding operations b) Accumulation of errors

   c) Incremental integer calculations d) None of the above

3. The following transformations are commutative

   i. Uniform scaling and rotation iii. Two successive translations

   ii. Scaling and rotation iv. Translation and rotation

   a) i, iii only b) i, iii, iv

   c) i, ii, iii d) ii, iii, iv

4. The most suitable method to clip a circle against a rectangular window

   a) Cohen-Sutherland line clipping b) Sutherland-Hodgeman polygon clipping

   c) NLN Line clipping d) Liang-Barsky Line clipping

5. The convex polygon boundary is called

   a) Control graph b) Control point

   c) Convex hull d) Spline

6. Identify the properties of Hermite splines

   i. Local adjustment iii. Curve sections dependent on endpoints

   ii. Interpolation iv. Global adjustment

   a) i, ii, iii b) i, ii only

   c) ii, iii, iv d) ii, iv only

7. The following is not a rigid body transformation

a) Reflection b) Shearing

c) Translation d) Rotation

8. The world-to-viewing coordinate transformation is

a) R.T b) T.R

c) S.T d) T.S

9. Dominant frequency refers to

a) Dominant wavelength b) Hue

c) Color d) All of the above

10. The detailed drawing of a scene is referred as

a) Key frame b) Storyboard

c) Animation d) In-between frame

PART B (10 x 2 = 20 Marks)

11. Differentiate Raster Scan and Random Scan Systems.
12. Discuss the property of circles.
13. Show that the composition of two successive rotations of a 2D object is commutative.
14. Indicate a transformation to reduce the size of a triangle A (10,20) B(40,50) C(0,30) to one third of its size by keeping point A fixed.
15. Mention the different ways to represent an object on a 3D scene.
16. Distinguish between interpolation and approximation splines.
17. What is the role of homogeneous coordinates in composite transformations?
18. Discuss about the principal vanishing point.
19. Illustrate the need for conversion between different color models.
20. Write the sequence of steps to animate a walking man.

PART C (5 x 14 = 70 Marks)

21. a) (i) Explain the working of a video display device with an example. (7)

(ii) Find the points on the ellipse in the first quadrant with major axis rx=6 and minor axis ry=4 units. (7)

(OR)

b) (i) Explain the role of various input devices in graphical applications. (7)

(ii) Consider a line A (10,20) B(20,35). Evaluate the points on the line using DDA line algorithm. (7)

22. a) A mirror is placed such that it passes through (2, 0) and (0, 2). Find the reflected view of a triangle with vertices (3, 4), (5, 5) and (4, 7) in this mirror.

(OR)

b) (i) Explain the working of the Cohen-Sutherland algorithm for line clipping. (7)

(ii) Given a clipping window **P** (0, 0), **Q** (150, 0), **R** (150, 200) and **S** (0, 200), find the visible portion of the line **A** (70, 50), B (10, 250) against the given window, using Cohen - Sutherland algorithm. (7)

23. a) How to calculate the plane parameters A, B, C and D for all surfaces of an object? How to determine any specified point is inside or outside the object?

(OR)

b) Explain the properties of Bezier curves. How to design Bezier curves and surfaces?

24. a) Derive an outline projection to project the point P(x,y,z) to the position P(x,y) on the view plane.

(OR)

b) Explain 3-D rotation and derive the expression for 3-D rotational transformation matrix.

25. a) Compare and contrast between RGB, YIQ, CMY, HSV and HLS Color Models with suitable illustration.

(OR)

b) (i) Given an object that changes its color and shape very frequently. How to implement morphing in this animation sequence? (7)

(ii) How to specify objects motion in the above sequence? Justify your answer. (7)

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