

B4.4-R4: COMPUTER GRAPHICS & MULTIMEDIA

NOTE:

1. Answer question 1 and any FOUR from questions 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours

Total Marks: 100

1.

- a) Define Orthographic Projection. Explain three types of perspective projections.
- b) Define following terms:
 - i) Aliasing
 - ii) Overstrike
 - iii) Picket fence
- c) Define Cubic Bezier Curve.
- d) Why are hidden surface algorithms needed? How does Z-buffer algorithm determine which surfaces are hidden?
- e) Describe World Coordinate System (WCS) and Normalized Device Coordinate System (NDCS)
- f) Define NTSC, PAL and HDTV
- g) What is Kinematics and Dynamics in terms of Animation?

(7x4)

2.

- a) Compare Random Scan Display with Raster Scan Display.
- b) Prove that two 2-D scaling transformation commute.
- c) Perform 45 degree rotation of a triangle A(0, 0), B(1, 1), C(5, 2) about the origin. Perform 45 degree rotation of the above triangle about the point P(-1, -1).

(6+4+8)

3.

- a) Define Homogeneous co-ordinates and justify the significance of it.
- b) Use the Cohen-Sutherland algorithm to clip line with points $p_1(70, 20)$ $-p_2(100, 10)$ against a window $a(50, 10)$, $c(80, 40)$.
- c) What steps are required to fill a region using the boundary-fill method?

(6+6+6)

4.

- a) List out the properties of Bezier Curve.
- b) Indicate which raster locations would be chosen by Bresenham's algorithm when scan converting a line from screen co-ordinate (1, 1) to screen coordinate (8, 5)?
- c) Mention Advantages and disadvantages of Z-buffer algorithm.

(8+5+5)

5.

- a) Give equations for RGB to HSV Transformation.
- b) Discuss the problems with Interpolated Shading Techniques.
- c) Differentiate between Gouraud and Phong Shading.

(8+4+6)

6.

- a) Given $P_0[3,3]$, $P_1[6,9]$, $P_2[12,9]$ and $P_3[9,3]$, the vertices of a Bezier polygon, determine seven points of Bezier Curve.
- b) Find the normalization transformation that maps a window whose lower left corner is at $(1,1)$ and upper right corner is at $(3,5)$ onto
 - i) a view port that is the entire normalized device screen.
 - ii) a view port that has lower left corner at $(0,0)$ and upper at $(\frac{1}{2},\frac{1}{2})$.

(9+9)

7.

- a) Define Motion Specification. Explain Direct Motion Specification and Goal Directed Systems.
- b) Differentiate between:
 - i) Multimedia and Hypermedia
 - ii) Lossy and Lossless compression
 - iii) Morphing and Tweaking
- c) What is MIDI file?

(6+9+3)