

## B4.4-R3: COMPUTER GRAPHICS & MULTIMEDIA SYSTEMS

### NOTE:

1. Answer question 1 and any FOUR questions from 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) What are frame buffers? What are its applications?
- b) Explain the Image morphing used in graphics animation?
- c) Prove that distance between two point-objects is invariant with respect to reflection and translation transformations.
- d) What is a spline curve? Explain the role of blending function to plot a spline curve.
- e) Differentiate between the two graphics standard GKS and PHIGS.
- f) Explain how MIDI files are created and what are their applications in multimedia applications?
- g) Why data compression is needed for multimedia?

(7x4)

2.

- a) Illustrate the general Brasenham's algorithm to plot a line from (0,0) to (-8, -4).
- b) Compute the points at infinity for the following parallel lines:  
 $x + y = 1$                        $x + y = 0$
- c) Explain orthographic projection of a slashed cube on  $x = 0$ ,  $y = 0$  and  $z = 0$ .

(10+4+4)

3.

- a) Describe different models used for illumination. How do you design surface normal vector. Explain its importance.
- b) Enumerate the region codes for visibility of an object with respect to a two-dimensional clipping window.
- c) Explain Phong shading model, how it overcomes the problem of Gouraud shading problem.

(6+6+6)

4.

- a) Describe video compression methods, what are the steps to optimize video files on CD-ROM.
- b) Describe the JPEG compression scheme?
- c) What is a "Hypertext"? Explain how it helps in presentation and use of information?

(6+8+4)

5.

- a) What is Bezier surface? Plot a cubic Bezier surface with seven control points.
- b) Explain the role of surface revolution.
- c) Describe the steps of computations of hidden surface by using Area subdivision method.

(6+6+6)

**6.**

- a) Compute the illumination of specular model for following:  
 $n = j$ ,  $L = -i + 2j - k$ ,  $S = i + 3/2 j + 1/2 k$
- b) Explain the process of anti-aliasing in display graphics.
- c) Describe the role of geometric curves in Font generation.

**(6+6+6)**

**7.**

- a) Illustrate the process of Z- buffer algorithm for the following:  
The rectangle with corner coordinates P1(10,5,10), P2(10,25,10), P3(25,25,10) and P4(25,5, 10) and the triangle with vertices P5(15,15,15), P6(25,25,5) and P7(30,10,5).
- b) Explain what is interlacing?
- c) Explain briefly the role of multimedia authority systems?

**(10+4+4)**