

B4.4-R3: COMPUTER GRAPHICS AND 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) Describe the process of morphing used in animation. How is it different from tweaking?
- b) Why do we study only cubic polynomial curves (rather than any other polynomial curves) in computer graphics? Discuss the use of blending function.
- c) JPEG uses transform domain coding. Is this statement true? Discuss.
- d) Compare the efficiencies of Cyrus-Beck and Cohen-Sutherland clipping algorithms.
- e) Explain the ray tracing and describe the procedure to determine the intersection of an arbitrary ray with YZ plane.
- f) How are the points lying at infinity handled? Describe perspective projection.
- g) Describe briefly Bresenham's circle drawing algorithm.

(7x4)

2.

- a) Explain why RGB colour model is used for display and CMY model for hardcopy.
- b) There are two lines joining at a vertex in a polygon. Write an algorithm/logic to find whether the other end points of line are in the same directions with respect to scan line passing through common vertex.
- c) Describe the features of Depths sort algorithm.

(4+8+6)

3.

- a) Describe the syntax of audio and video data streams.
- b) Explain, how hypertext data performs the linking of information of different media.
- c) Discuss the functions of: Scanners, Frame grabbers and CD-ROM.

(8+4+6)

4.

- a) Describe global illumination model. Define surface normal and reflection vector.
- b) Describe the Z buffer algorithm for hidden surface removal.

(9+9)

5.

- a) Using both simple DDA and Bresenham's algorithm list of the activated pixels for the line from (0, 0) to (-8, -3). Comment on the initialization affect on the result and compare the efficiency of the two.
- b) Explain the procedure of rendering the pipelines.

(12+6)

6.

- a) Differentiate between parallel, perspective and isometric projection and their uses.
- b) Setup an algorithm for converting any specified sphere, ellipsoid or cylinder to a polygon mesh representation.
- c) Discuss the operations and use of CCD Camera.

(7+7+4)

7.

- a) Determine the Bezier blending functions for a given set of four control points in xy plane to generate Cubic Bezier Curve.
- b) What is in-bitweening in computer animation?
- c) Explain how quantisation can result in data loss in image compression.

(10+4+4)