MCS-053

08605

MCA (Revised)

Term-End Examination

June, 2009

MCS-053 : COMPUTER GRAPHICS AND MULTIMEDIA

Time : 3 hours *Maximum Marks : 100*

Note : *Question Number **1** is **compulsory**. Attempt any **three** questions from the rest.*

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1. (a) Define the term intensity interpolation ? Explain Goroud shading. 5

(b) Write Z-Buffer Algorithm for hidden surface detection. Explain how this algorithm is applied to determine the hidden surfaces. 5

(c) What is image filtering ? Why is it required ? 5

(d) Compute the intermediate points on the line drawn from (0,0) to (5,10) using Bresenham's algorithm. 5

(e) What is the difference between parallel and perspective projection? Categorize the various types of parallel projections. 5

(f) Explain the concept of window to view port transformation with the help of suitable diagram. 5

(g) What is the advantage of using homogenous coordinate system ? Write the transformation matrix in homogenous coordinate system for "xy-shear" about the origin. 5

(h) Why do we use an authoring tool in the context of multimedia ? Explain the features of any two types of authoring tools. 5

2. (a) Explain the following terms with the help of an example/diagram, if needed. 8

(i) Morphing

(ii) Tweening

(iii) Volume Rendering

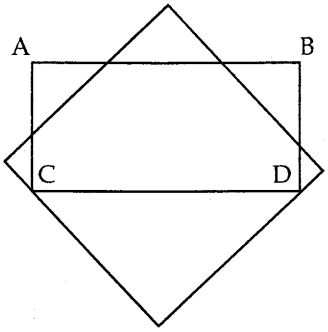
(iv) Fractual Models

(b) Derive a general 2D transformation matrix for rotation about the origin. Perform a 45° rotation of a square having vertices A(0,0), B(0,2), C(2,2), D(2,0), about the origin 7

(c) Explain Cyrus Beck parametric line clipping algorithm. 5

3. (a) Derive the 2D-transformation matrix for reflection about the line $y=mx$, where m is a constant. Use this transformation matrix to reflect the triangle A(0,0), B(1,1), C(2,0) about the line $y=2x$. 10

(b) Explain pseudocode for Sutherland hodgman polygon clipping algorithm. Using this algorithm clip the following polygon against the rectangular window ABCD as given below. **10**



4. (a) What are the refreshing display devices ? Describe the working principle of CRT displays with the help of suitable diagram. Differentiate between Random and Raster Scan display devices. **9**

(b) Write the three main properties of Bezier curve. Explain the condition for smoothly joining two Bezier curve segments. **6**

(c) Explain the principle of Ray Tracing with the help of a suitable diagram. List at least four applications of Ray Tracing. **5**

5. Explain the following terms with the help of suitable diagram/example, if needed. **20**

(a) Oblique Projection.

(b) Bezier Surfaces.

(c) Object-space approach in Visible-surface detection.

(d) Specular Reflection.

(e) Representational Animation.

(f) Hyper media.

(g) GIF File compression.

(h) Drawing & painting devices.

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