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Total No. of Pages: 02
Total No. of Questions: 09

MCA (Sem.-4th)

INTERACTIVE COMPUTER GRAPHICS

Subject Code: MCA-403
Paper ID: [A2557]

Time: 3 Hrs. **Max. Marks: 100**

INSTRUCTION TO CANDIDATES:
Attempt FIVE Questions in all, including Q-9 in Section-E, which is compulsory and selecting ONE each from Section-A to Section-D.

SECTION-A

Q.1. Define Computer Graphics. List at least three important applications of computer graphics. Describe the various techniques for producing color images on a raster display device. (20)

Q.2. a) List and briefly explain various pointing and positioning devices used in interactive computer graphics. Why won't a light pen work with LCD?

b) What do you understand by

(i) Colour lookup table (LUT) for raster displays

(ii) Palette of a terminal? Consider a frame buffer having 4 bits per pixel and suppose C's. How many entries are there in the LUT?

How many colours can be displayed at one time and how many colours are there in the palette? (10, 10)

SECTION-B

Q.3. a) List and explain various input and output primitives in C/C++/OpenGL for graphics programming.

b) What is scan conversion? Write out real code for the Bresenham's algorithm for scan conversion of lines. (10, 10)

Q.4. a) Derive the window-to-viewport transformation equations by first scaling the window to the size of the viewport and then translating the scaled window to the viewport position.

b) Describe the line-clipping algorithm proposed by Cohen-Sutherland. (10, 10)

SECTION-C

Q.5. What is a three-dimensional display? Explain briefly the transformation steps for obtaining a composite matrix for rotation about an arbitrary axis with the rotation axis projected on to the z axis. (20)

Q.6. What are the properties of B-spine curves? Explain the process of generating curves and surfaces using B-spine method. What are advantages of B-spines over Bezier curves? (20)

SECTION-D

Q.7. What is Hidden-Surface Removal (HSR)? Outline the z-buffer algorithm for HSR. List the advantages and disadvantages of the z-buffer algorithm. (20)

Q.8. a) Give description of a simple shading model. What are its weak points and how do we improve it?

b) Write a short note on "Surface rendering methods". (10, 10)