

MCA (Revised)
Term-End Examination
December, 2007

**MCS-053 : COMPUTER GRAPHICS AND
MULTIMEDIA**

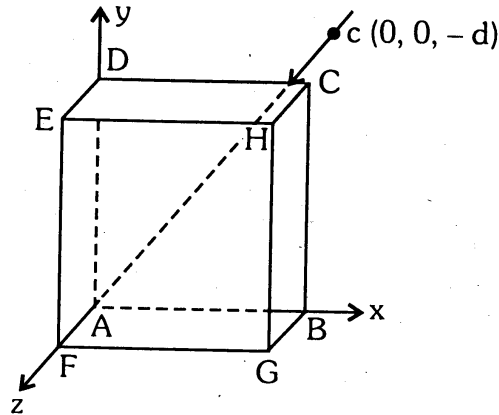
Time : 3 hours

Maximum Marks : 100

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

1. (a) What is an image's aspect ratio ? If an image has a height of 2 inches and an aspect ratio of 1.5, what is its width ? 2+3=5
- (b) Distinguish between window and viewport. Describe how window to viewport mapping is done. 2+3=5
- (c) Prove that successive scalings are multiplicative. Magnify the triangle with vertices A(0, 0), B(1, 1) and C(5, 2) to twice its size while keeping C(5, 2) fixed. 4+6=10
- (d) The unit cube (given below) is projected onto the xy plane. Note the position of the x, y and z axes. Draw the projected image using the standard perspective transformation with 10

- (i) $d = 1$, and
- (ii) $d = 10$, where d is distance from the view plane.



- (e) Given $p_0(0, 0)$, $p_1(1, 3)$, $p_2(3, 2)$, $p_3(2, 0)$ as vertices of Bezier curve, determine 2 points on the Bezier curve. 5
- (f) Write short notes on : 5
 - (a) Electronic Encyclopedia
 - (b) Lossless Audio formats
- 2. (a) What is the limitation of Cohen Sutherland line clipping algorithm, which was overtaken by Cyrus Beck line clipping algorithm ? Explain Cyrus Beck line clipping with example. 8
- (b) Write pseudocode for Mid-point Circle Generation Algorithm. 6
- (c) Use DDA line generation algorithm to draw a line from $(0, 2)$ to $(7, 7)$. 6

3. (a) Find the transformation matrix for the reflection about the line $y = x$. 5
- (b) Briefly describe the polygon representation method. 5
- (c) Describe the conditions to be satisfied, in Area Subdivision method, in order to identify when a surface is not to be divided further. 6
- (d) What are the advantages and disadvantages of 2-buffer method ? What is the maximum number of objects that can be handled by 2-buffer algorithm ?
3+1=4
4. (a) Why do we need illumination models ? Compare Ambient Reflection with Diffuse Reflection. 7
- (b) Compare and contrast 7
- (i) Parallel projection and Perspective projection.
- (ii) Gouraud shading and Phong shading.
- (c) What do you mean by Antialiasing ? How does the technique of antialiasing work to get rid of the problem of aliasing ? 6
5. (a) How many frames does a one-minute animation film sequence with no duplication require if there are 6 in between for each pair of key frames ? What will be the answer if duplication is there ? 5

- (b) Differentiate between the following :
- (i) Procedural animation and Stochastic animation 3
 - (ii) Bitmap graphic and Vector graphic 3
 - (iii) Hypertext and Hypermedia 2
 - (iv) Printer and Plotter 2
- (c) What do you mean by the term Authoring tools in Multimedia ? Briefly describe any two authoring tools. 5