

**MCA (Revised)**  
**Term-End Examination**  
**December, 2007**

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

Time : 3 hours

Maximum Marks : 100

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

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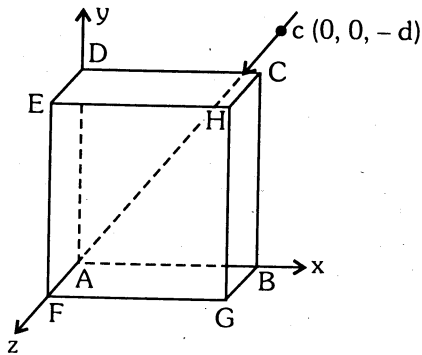
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1. (a) What is an image's aspect ratio ? If an image has a height of 2 inches and an aspect ratio of 1.5, what is its width ? 2+3=5
- (b) Distinguish between window and viewport. Describe how window to viewport mapping is done. 2+3=5
- (c) Prove that 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

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- (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.

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- (f) Write short notes on :

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- (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.

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- (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