

MCA (Revised)
Term-End Examination
June, 2011

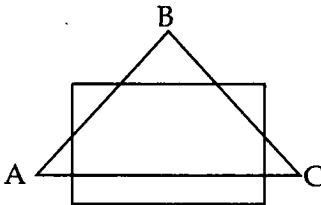
**MCS-053 : COMPUTER GRAPHICS AND
MULTIMEDIA**

Time : 3 hours

Maximum Marks : 100

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

1. (a) Differentiate between the following. 4
(i) Graphics and Animation
(ii) Printer and Plotter
- (b) Write DDA line drawing algorithm and use the same to produce a line segment from (1, 1) to (9, 7).. 4
- (c) Use the Sutherland - Hodgman polygon clipping algorithm to clip the ΔABC given below. 4



- (d) Find the transformation matrix for the reflection about the line $y=4x$. 4
- (e) What is "Projection" in computer graphics ? Categories the various types of projections. 4
- (f) Prove the following, for Bezier curves 4
- (i) $P(u=0) = p_0$
- (ii) $\sum_{i=0}^n B_{n,i}(u) = 1$
- (g) How does the Z-buffer algorithm determines which surfaces are hidden. 4
- (h) Differentiate between Ray tracing and Ray casting. 4
- (i) Determine the expression of frame spacing, which can be used to simulate positive acceleration in any animation. 4
- (j) Explain any two types of each of the following. 4
- (i) Loss less audio formats
- (ii) Authoring tools
2. (a) How Raster scan display devices are different from Random scan display devices ? Can we use frame buffers to control picture colour and intensity, justify your answer with suitable arguments. 5

- (b) How Bresenham line generation algorithm overcomes the limitations of DDA algorithm ? Use Bresenham line generation algorithm to draw a line segment from (15, 5) to (20, 9). 5
- (c) How Cohen Sutherland line clipping algorithm differs from the Cyrus Beck line clipping algorithm ? Discuss all 3 cases of line clipping, which arise in Cohen Sutherland line algorithm. Draw suitable diagram to discuss the cases. 10
3. (a) Explain the terms "Parametric Continuity" and "Geometric Continuity" in Bezier curves. 5
- (b) Discuss Area Subdivision Method. What are the conditions to be satisfied, in Area subdivision method, so that it is finalized that no further surface division is required ? 8
- (c) Explain the following : 7
- (i) Phong Shading.
- (ii) Anti Aliasing.
4. (a) How many key frames does a 30 seconds animation film sequence with no duplicates require ? How the results are affected if five in between frames are inserted between each pair of key frames ? 5

- (b) Explain the following : 5
- (i) Morphing
- (ii) Cel Animation
- (c) Differentiate between the following : 5
- (i) Bitmap graphics and vector graphics
- (ii) Hypertext and Hypermedia
- (d) What are Authoring tools ? What are the various types of authoring tools available ? Discuss any one of them. 5
5. (a) Find final coordinates of the ΔABC , $A(-3, 0)$; $B(-1, 1)$; $C(-1, -1)$ when it is subjected to clock wise rotation of 45° about an axis passing through an arbitrary point $P(-1, 1)$. Draw suitable figure to demonstrate your solution. 7
- (b) Prove that two successive rotations are additive i.e. $R(\theta_1).R(\theta_2) = R(\theta_1 + \theta_2)$. Draw suitable diagram to demonstrate your solution. 3
- (c) Derive a general perspective transformation matrix with respect to an arbitrary centre of projection, $C(a, b, c)$. Obtain the perspective transformation matrix onto $Z = -5$ plane, where the centre of projection is at $(0, 0, 18)$. 10