

MCA (Revised)

Term-End Examination

June, 2017

05523

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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1. (a) Define Scan Conversion. Differentiate between Raster and Random Scanning. 5
- (b) With the help of a diagram, explain the working of CRT. Why is refreshing needed in CRT? 5
- (c) What do you mean by composite transformation? Prove that two successive reflections about either of the co-ordinate axes is equivalent to a single rotation about the co-ordinate origin. 5
- (d) Explain taxonomy of projection. 5
- (e) Define Gouraud and Phong shading techniques. 5

- (f) Explain the working of Z-buffer algorithm. 5
- (g) Define Animation. What are the various types of Animation? 5
- (h) What are the different AVI Codecs? Discuss any two of them. 5
2. (a) Derive Bresenham's line generation algorithm. Draw the line segment joining the points (20, 10) and (25, 14) using Bresenham's line generation algorithm. 10
- (b) Distinguish between scan line polygon fill and flood fill algorithms. 5
- (c) A clipping window ABCD is located as follows :  
 A(100, 10), B(160, 10), C(160, 40) D(100, 40)  
 Using Cohen – Sutherland line clipping algorithm, find the visible portion of the line segment EF and GH E(50, 0), F(70, 80), G(120, 20) and H(140, 80). 5
3. (a) Find the transformation matrix for the reflection about the lines 10
- (i)  $y = x$
- (ii)  $y = -x$
- (b) What is homogeneous co-ordinate system? Why is homogeneous co-ordinate system required? 5

- (c) What are vanishing points ? Explain the conditions to obtain one, two and three vanishing points. 5
4. (a) Derive the equations for Bezier curve. Given points  $p_0(1, 1)$ ,  $p_1(2, 3)$ ,  $p_2(4, 3)$  and  $p_3(3, 1)$  as vertices of Bezier curve, determine three points on the curve. 10
- (b) Explain the Scan line method for visible surface detection. 5
- (c) Explain Phong Specular Reflection Model. 5
5. (a) Define the term Authoring tool. Discuss different types of authoring tools. 10
- (b) Given a circle of radius  $r = 5$ , determine the positions along the circle octants in 1<sup>st</sup> quadrant from  $x = 0$  to  $x = y$ . 5
- (c) Obtain the mirror reflection of the triangle formed by the vertices  $A(0, 3)$ ,  $B(2, 0)$  and  $C(3, 2)$  about the line passing through the points  $(1, 3)$  and  $(-1, -1)$ . 5
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