

MCA (Revised)
Term-End Examination
December, 2014

04684

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

Time : 3 hours

Maximum Marks : 100

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

1. (a) Explain how frame buffer is used to store picture information. 5
- (b) Explain the need of Homogeneous coordinate system in 2D transformation. 5
- (c) Explain DDA line drawing algorithm. What are the disadvantages of this algorithm? 5
- (d) Define Animation and describe how it can be used in multimedia. 4
- (e) Differentiate the following : 6
 - (i) Bitmap vs Vector graphics
 - (ii) JPEG vs GIF
 - (iii) Hypertext vs Hypermedia
- (f) Prove the following for Bezier curve : 5
 - (i) $P(u=0) = p_0$
 - (ii) $P'(u=0) = n(p_1 - p_0)$

- (g) Derive an expression for Phong Specular Reflection Model. 5
- (h) Explain Isometric projection. Differentiate among Isometric, Dimetric and Trimetric projections. 5
2. (a) Given a circle with radius $r = 8$, determine pixel position along the circle in the 1st quadrant from $x = 0$ to $x = y$. 8
- (b) Explain the following 3D transformations with their 3D transformation matrix : 9
- (i) Scaling with respect to origin
- (ii) Rotation with respect to $z = 0$ plane
- (iii) xy -Shearing
- (c) Differentiate between C^0 and C^1 continuity in Bezier curve. 3
3. (a) Given a triangle ABC, whose coordinates are A(1, 1), B(5, 2) and C(4, 3).
- (i) Reflect the given triangle about x axis.
- (ii) Reflect the given triangle about y axis.
- (iii) Reflect the given triangle about $y = x$ axis.
- In each case, find the final coordinates of the reflected triangle ABC. 10
- (b) Explain Sutherland-Hodgman Polygon Clipping Algorithm. 5
- (c) Explain positive acceleration for simulating motion. 5

4. (a) Explain Z-Buffer Algorithm for hidden surface removal. What are its demerits ? 7
- (b) What are the differences between Gouraud Shading and Phong Shading methods ? 5
- (c) Suggest with reasons a potential application of multimedia other than the applications in the field of entertainment and education. 4
- (d) What are touch panels ? List different touch panels that are currently available for use. 4
5. (a) Consider the line segment AB in 3D parallel to the z-axis with end points A(-6, 5, 3) and B(6, -7, 18). Perform a perspective projection on the $x = 0$ plane, where the eye is placed at E(-10, 0, 0). 8
- (b) Explain the following terms : $6 \times 2 = 12$
- (i) Card based authoring tools
 - (ii) Raster and Random Scan
 - (iii) Sound editing tools
 - (iv) Anti-aliasing
 - (v) Ambient light
 - (vi) Plasma panel
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