

09460

**MCA (Revised)**  
**Term-End Examination**  
**June, 2012**

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

*Time : 3 hours**Maximum Marks : 100*

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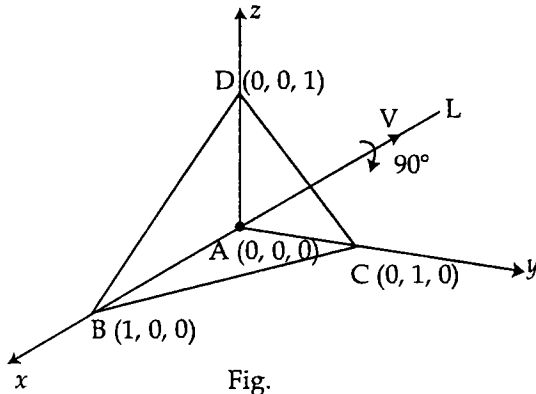
*Note : Question number 1 is compulsory. Attempt any three questions from the rest.*

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|----|-----|---|---|
| 1. | (a) | What is Raster Scan and how is it different from Random Scan ?  | 5 |
|    | (b) | What is aliasing ? Explain how Antialiasing overcome the problem of aliasing.   | 5 |
|    | (c) | Find the transformed point $p'(x,y)$ , caused by rotating $P(5,1)$ about the origin through an angle of $90^\circ$ .  | 5 |
|    | (d) | Derive a general transformation Matrix for scaling transformation with respect to a fixed point $P(h,R)$ .  | 5 |
|    | (e) | What are the benefits of Bresenham's line drawing algorithm over DDA algorithm.   | 4 |
|    | (f) | Find the coordinates (pixel position) of a circle in the first quadrant having centre at point $O(0,0)$ and a radius 4 using mid-point circle generation algorithm. | 4 |

- (g) Given  $P_0(0,40)$ ,  $P_1(40,40)$ ,  $P_2(60, 20)$ ,  $P_3(60, -10)$  as Vertices of Bezier Curve, Find the general expression to express a cubic Bezier curve ? 4
- (h) Differentiate between the following : 8
- (i) Zero Acceleration Vs. Non zero Acceleration for simulating Motion.
  - (ii) Hypertext Vs. Hyper Media
  - (iii) GIF Vs. JPEG
  - (iv) Key Frame Vs. Cel Animation
2. (a) Write Integer Bresenham's line drawing algorithm and show how it draw a line, whose start point is (4,4) and end point is (-3,0). 8
- (b) How much time is spent scanning across each row of pixels during screen refresh on a raster system with a resolution of 1280 by 1024 and a refresh rate of 60 frames per second ? 6
- (c) Explain the specular Reflection with the help of suitable diagram. 3
- (d) Define the term parallel projection. Categorise various types of parallel projection. 3

3. (a) Perform reflection of a triangle A(0,0), B(2,0) and C(1,5). 10
- (i) about the horizontal line  $y = 5$
- (ii) about the line  $y = x + 5$ .
- (b) What is shearing transformation ? Explain  $x$ -shearing,  $y$ -shearing with suitable example (s). 5
- (c) Explain, the 3 cases of line visibility in cohen-Sutherland line clipping algorithm. 5
4. (a) Write any three properties of Bezier curve. 4  
What are the limitation (s) of Bezier curve ?
- (b) What is video conferencing ? Discuss the challenges related to such facilities 4
- (c) Explain how Z buffer method and scan line methods differ to find the visible surface detection. 5
- (d) The pyramid defined by the coordinates A(0,0,0), B(1,0,0), C(0,1,0) and D(0,0,1) is rotated  $90^\circ$  about the line L that has direction vector  $V = \hat{i} + \hat{j} + \hat{k}$  and passing through the origin. Find the coordinates of rotated pyramid ABCD. 7



5. (a) Consider a shiny surface with diffused reflection coefficient of 0.6 and ambient reflection coefficient of 0.5, the surface has normal in the direction of  $4i+6j+5k$  ; say some light is incident on it from the direction  $i+j+k$  such that the ambient and diffused intensities are of order 3 and 4 units. Determine the intensity of the reflected light. 6
- (b) Explain the following terms : 14
- (i) Card (or page) based authoring tools.
  - (ii) Frame buffer.
  - (iii) Virtual Reality.
  - (iv) Animation Tools.
  - (v) Video file formats.
  - (vi) Ray Tracing
  - (vii) Sound editing tools.