

**MCA (Revised)**  
**Term-End Examination**  
**June, 2022**

**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 Drawing and Painting applications. Give an example of each. 5
- (b) Explain Sutherland-Hodgman polygon clipping algorithm with an example. 5
- (c) Compare Raster Scan and Random Scan display devices. 5
- (d) What is Bresenham line generation algorithm ? Compare it with DDA line generation algorithm. 5

- (e) What is scan line polygon fill algorithm ?  
Distinguish it with flood fill algorithm. 5
- (f) Briefly discuss TIFF and JPEG fill formats. 5
- (g) Which type of clipping windows cannot be  
handled by Cyrus Beck line clipping  
algorithm ? How can such cases be  
handled ? 5
- (h) Briefly discuss Geometric continuity in  
Bezier curves with a suitable diagram. 5
2. (a) Determine the transformation matrix when  
a square ABCD with coordinates A(0, 0),  
B(5, 0), C(5, 5), D(0, 5) is translocated by  
2 units in X-direction and 3 units in  
Y-direction. 5
- (b) Find the final coordinates of a triangle ABC  
with coordinates A(0, 0), B(1, 1) and C(5, 2),  
subjected to anticlockwise rotation of  $45^\circ$   
about the origin. 5
- (c) Differentiate between parallel and  
perspective projection, with a suitable  
diagram. 5
- (d) Give the transformation matrix for  
translation, rotation, reflection, scaling and  
shearing in 3D-Homogeneous coordinate  
system. 5

3. (a) Formulate the mathematical function, to regulate the frame spacing, for simulating : 10
- (i) Zero acceleration motion
  - (ii) Positive acceleration motion
- (b) What is Projection ? Consider the line segment AB in 3D parallel to the z-axis with end points A(-5, 4, 2) and B(5, -6, 18). Perform a perspective projection on the  $X = 0$  plane, where the eye is placed at (10, 0, 10). 10
4. (a) Differentiate between the following : 10
- (i) Hypertext and Hypermedia
  - (ii) Bitmap graphics and Vector graphics
- (b) What is Phong Shading ? Give the merits and demerits of Phong Shading. 5
- (c) What is the problem of Aliasing ? How does the technique of anti-aliasing work to get rid of the problem of aliasing ? 5
5. (a) What is a computer animation ? How is it different from computer graphics ? 5
- (b) How many key frames does a one-minute animation film sequence with no duplications require ? 5

(c) Write short notes on any *four* of the following :  $4 \times 2 \frac{1}{2} = 10$

- (i) Ray Casting
  - (ii) Z-Buffer Algorithm
  - (iii) Windowing Transformation
  - (iv) Oblique Projection
  - (v) Authoring Tools
-