

Time: 3 Hours

Marks: 80

- Note: 1) Question 1 is compulsory.  
2) Attempt any three questions from the remaining questions.  
3) Assume suitable data wherever applicable.

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|-----------|---|-----------|
| <b>Q1</b> | <b>a</b> Prove that for 2D object successive rotation is additive.  | <b>5</b>  |
|           | <b>b</b> Explain applications of computer graphics.   | <b>5</b>  |
|           | <b>c</b> Explain types of projection.   | <b>5</b>  |
|           | <b>d</b> Fractals   | <b>5</b>  |
| <b>Q2</b> | <b>a</b> Explain Cohen-Sutherland line clipping algorithm and clip line AB with A(40,15), B(75,45) against window with lower left corner (50,10) and top right corner(80,40). | <b>10</b> |
|           | <b>b</b> Explain VR modeling  | <b>10</b> |
| <b>Q3</b> | <b>a</b> Derive transformation matrix for rotation about fixed point and explain with suitable example.   | <b>10</b> |
|           | <b>b</b> Define window and viewport, explain viewing transformation.  | <b>10</b> |
| <b>Q4</b> | <b>a</b> Generate five points on cubic bezier curve with control points A(0,0), B(1,2), C(3,2), D(2,0).   | <b>10</b> |
|           | <b>b</b> What is virtual reality? Explain components of virtual reality.  | <b>10</b> |
| <b>Q5</b> | <b>a</b> Explain graphical rendering pipeline.  | <b>10</b> |
|           | <b>b</b> Explain midpoint circle algorithm. Find pixel positions to plot circle centered at origin and of radius 10.  | <b>10</b> |
| <b>Q6</b> | <b>Write short note (Any Four)</b>  |           |
|           | <b>a</b> Inside test  | <b>5</b>  |
|           | <b>b</b> Morphing   | <b>5</b>  |
|           | <b>c</b> Raster and random scan display   | <b>5</b>  |
|           | <b>d</b> Types of VR system   | <b>5</b>  |
|           | <b>e</b> Relevance of homogeneous coordinate system.  | <b>5</b>  |

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