



**Second Semester MCA Degree Examination, June/July 2024**  
**Computer Graphics with Open GL**

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
 2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
<b>Q.1</b>	a.	Explain Bresenham's line drawing algorithm and provide an illustrative example.	10	L3	CO1
	b.	Define computer graphics and provide its application across diverse fields.	10	L2	CO1
<b>OR</b>					
<b>Q.2</b>	a.	Explain Refresh cathode Ray with neat diagram.	10	L2	CO1
	b.	Explain the mid – point circle algorithm and demonstrate it using a circle with a radius of 10. Show how to find positions along with circle's octant in the first quadrant from X = 0 to X = Y. Assume the circle's center is at the origin.	10	L3	CO1
<b>Module – 2</b>					
<b>Q.3</b>	a.	What is the need of homogeneous coordinate system? Explain translation, rotation and scaling in 2D Homogeneous coordinate system with matrix representation.	10	L3	CO2
	b.	Explain Scanline polygon filling algorithm with neat sketches and example.	10	L3	CO2
<b>OR</b>					
<b>Q.4</b>	a.	Explain with examples any two algorithms used for to identify the interior area of polygon.	10	L3	CO2
	b.	With neat diagram, explain two dimensional viewing pipelines? Explain OpenGL 2D viewing functions.	10	L2	CO2
<b>Module – 3</b>					
<b>Q.5</b>	a.	What is clipping? Explain with example the Cohen Sutherland line clipping algorithm.	10	L3	CO3
	b.	Explain window to view port coordinate transformation.	10	L2	CO3
<b>OR</b>					
<b>Q.6</b>	a.	Define color model. With neat diagram explain the RGB and CMY color model.	10	L2	CO3
	b.	Explain different types of light sources supported by OpenGL.	10	L2	CO3

<b>Module – 4</b>					
<b>Q.7</b>	<b>a.</b>	Explain with example, Depth buffer algorithm used for visible surface detection. Discuss the advantages and disadvantages.	<b>10</b>	<b>L3</b>	<b>CO4</b>
	<b>b.</b>	Explain 3D viewing pipeline with neat diagram and transformation from world to viewing coordinates.	<b>10</b>	<b>L3</b>	<b>CO4</b>
<b>OR</b>					
<b>Q.8</b>	<b>a.</b>	Explain in detail about vanishing points for Perspective projections.	<b>10</b>	<b>L3</b>	<b>CO4</b>
	<b>b.</b>	Explain orthogonal projections in detail.	<b>10</b>	<b>L3</b>	<b>CO4</b>
<b>Module – 5</b>					
<b>Q.9</b>	<b>a.</b>	What are the different logical input devices and explain with example.	<b>10</b>	<b>L2</b>	<b>CO5</b>
	<b>b.</b>	How pop-up menus are created using GLUT?	<b>10</b>	<b>L2</b>	<b>CO5</b>
<b>OR</b>					
<b>Q.10</b>	<b>a.</b>	Explain how keyboard, window and mouse events are recognized by GLUT. Give suitable example.	<b>10</b>	<b>L2</b>	<b>CO5</b>
	<b>b.</b>	List the properties of Bezier curve and also explain Bezier technique of generated curves.	<b>10</b>	<b>L2</b>	<b>CO5</b>

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