

**K. J. Somaiya Institute of Engineering and Information Technology, Sion, Mumbai-22**  
(Autonomous College Affiliated to University of Mumbai)

**End Semester Exam**

Nov – Dec 2022

B.Tech (Artificial Intelligence and Data Science)

Examination: SY Semester: III

Course Code: AIC305 and Course Name: Computer Graphics

**Duration: 2.5 Hours Max. Marks: 60**

**Instructions:**

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT Level
<b>Q. 1</b>	<b>Solve any six questions</b>	12		
i	Write Advantages and disadvantages of DDA		CO 2	
ii	Compare Raster scan and Random Scan display		CO 1	
iii	Write about Orthogonal Parallel Projection.		CO 5	
iv	Summarize properties of Homogeneous Coordinate representation		CO 3	
v	What is Normalization transformation?		CO 4	
vi	List applications of Computer Graphics		CO 1	
vii	Write advantages and disadvantages of depth buffer algorithm.		CO 6	
viii	Show that the composition of two rotations is additive.		CO 3	
<b>Q.2</b>	<b>Solve any four questions</b>	16		
i	Use Bresenham's algorithm to rasterize a line segment from (5,5) to (13,9).		CO 2	
ii	Find the transformation matrix that transforms a given square ABCD to half its size with center still remaining at the same position. The coordinates of square are A(1,1), B(3,1), C(3,3), D(1,3) center at (2,2).		CO 3	
iii	Explain Sutherland-Hodgman clipping algorithm.		CO 4	
iv	Distinguish between flood-fill and boundary-fill algorithms.		CO 2	
v	Explain Z buffer algorithm.		CO 6	
vi	What are the different types of fractals?		CO 5	
<b>Q.3</b>	<b>Solve any two questions</b>	16		
i	Derive the transformation matrix for 2D rotation about arbitrary point.		CO 3	
ii	Describe different types of Animation.		CO 6	
iii	Derive Bezier curve. write also the properties of Bezier curve		CO 5	
<b>Q.4</b>	<b>Solve any two questions</b>	16		
i	Give Midpoint circle drawing algorithm. Explain the same with suitable example.		CO 2	
ii	Write a line clipping algorithm which uses parametric form of equation. Test it for line $P_1P_2$ where $P_1 = (10, 10)$ and $P_2 = (60, 30)$ against the window with $(X_{wmin}, Y_{wmin}) = (15, 15)$ and $(X_{wmax}, Y_{wmax}) = (25, 25)$ .		CO 4	
iii	What is meant by parallel and perspective projections? Derive matrix for perspective projections.		CO 5	