SOMAIYA
VIDYAVIHAR UNIVERSITY

Semester: July 2023 –October 2023		
Maximum Marks: 100	**Examination: ESE Examination**	**Duration:3 Hrs.**

Programme code: 01 Programme: UG		Class: TY	Semester: M(SVU 2020)

Name of the Constituent College: K. J. Somaiya College of Engineering	Name of the department: Computer Engineering

Course Code: 116U01E511	Name of the Course: Computer Graphics

Instructions: 1)Draw neat diagrams 2) All questions are compulsory
3) Assume suitable data wherever necessary

Que. No.	Question	Max. Marks
Q1	Solve any **Four**	20
i)	State the application of Computer Graphics	5
ii)	What is meant by Inverse transformations ?	5
iii)	What is a clipping window in computer graphics, and how does it relate to the clipping process?	5
iv)	What is meant by orthogonal projections & perspective projections?	5
v)	What are the fundamental types of input devices used in computer graphics, and how do they facilitate user interaction with graphical applications?	5
vi)	What is openGL?	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	Write a short note on raster transformations.	5
ii)	Write a short note on homogeneous coordinates.	5
	OR	
Q2 A	Explain Boundary filled region with suitable diagram, advantages and disadvantages.	10
Q 2 B	Solve any **One**	10
i)	Explain aliasing and anti-aliasing effect in computer graphics.	10
ii)	Explain all 2D geometric transformation.	10

Que. No.	Question	Max. Marks
Q3	Solve any **Two**	20
i)	Consider a graphics system where the clipping window is defined as follows: (Xmin, Ymin) =(50, 50) and (Xmax, Ymax) = (300, 200). A line segment has endpoints at A(20, 80) and B(200,250). Determine whether this line segment is entirely inside, partially inside, or entirely outside the clipping window.	10
ii)	Given a convex polygon defined by the following vertices in counter clockwise order: A(100,100), B(200, 100), C(200, 200), and D(100, 200), clip it against a rectangular clipping window with (Xmin, Ymin) = (150, 150) and (Xmax, Ymax) = (250, 250) using the Sutherland- Hodgeman algorithm.	10
iii)	Explain the order of applying transformations (e.g., translation, rotation, scaling) and how it impacts the final result in a composite transformation.	10

Que. No.	Question	Max. Marks
Q4	Solve any **Two**	**20**
i)	Explain the concept of Z-buffer and its role in implementing the depth buffer method for visible surface determination?	10
ii)	Discuss the trade-offs between different visible surface detection methods and their suitability for specific types of 3D graphics applications.	10
iii)	How do OpenGL curve functions and surface functions contribute to the development of interactive 3D applications, and what capabilities do they offer to developers in terms of user interaction and visualization?	10

Que. No.	Question	Max. Marks
Q5	Solve any **four**	**20**
i)	Explain DDA .	5
ii)	Explain CP, Moveto(), Lineto() .	5
iii)	Write a short note on scan – line algorithm.	5
iv)	Briefly describe four region codes used in the Cohen-Sutherland line clipping algorithm .	5
v)	Mention few principles to be considered when designing interactive programs to ensure logical and intuitive user interactions?	5
vi)	Explain ambient light in the context of illumination models.	5