



Semester: July 2024 –November 2024		
Maximum Marks: 100	Examination: ESE Examination	Duration:3 Hrs.
Programme code: 01	Class: TY	Semester: V (SVU 2020)
Programme: Computer Engineering		
Institute/School/Department: K. J. Somaiya School of Engineering	Name of the Department: COMP	
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)	Enlist the application of Computer graphics in Animation and entertainment industry.	5
ii)	Give OpenGL function for Line drawing with example.	5
iii)	What is GLUT? Explain usability of it.	5
iv)	Explain Perspective Projection with example.	5
v)	Find the equation of the line $y' = mx' + b$ in xy coordinates if the $x'y'$ coordinate system results from a 90° rotation of the xy coordinate system	5
vi)	Why do we say that red, green, and blue only roughly coincide with the wavelength values that cause peak response from the three types of color-sensitive cones?	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	What steps must be added to a fill algorithm if a region is to be filled with a pattern?	5
ii)	Why is it important for the designer to remain consistent when choosing either local or global aliasing?	5
OR		
Q2 A	The coordinates of the vertices of a polygon are shown in Fig	10
<p>(a) Write the initial edge list for the polygon. (b) State which edges will be active on scan lines $y = 6, 7, 8, 9$, and 10.</p>		



Q 2 B	Solve any One	10
i)	A pie chart needs to draw to show the percentage of total marks obtained by students. Suppose 8% of students got 90% and above; 52% got 75% to 85%; 30% got 60% to 75% and the remaining obtained below 60% marks. No one failed (<50% marks). Write pseudo code to draw the pie chart and fill the segments of the pie chart with different colours.	10
ii)	You're appointed for Tech Team leader for Abhiyantriki 2025, As a tech team leader you need to design the 3D visualization for the past 07 Years of Journey of Abhiyantriki through the VR system. Provide the following: <ul style="list-style-type: none"> 1 Provide the detailed solution 2 Software requirement for development 3 Software requirement for Deployment 4 Hardware requirement for development 5 Hardware requirement for Deployment 	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	Prove that an intersection point of two straight lines $PQ[(-1, -1), (3, 5/3)]$ and $RS[(-1/2, 3/2), (3, -1/2)]$ will be exactly the same as the intersection point of transformed intersecting lines $P'Q'$ and $R'S'$ drawn after the transformation. The transformation may be taken as $\begin{pmatrix} 1 & 2 \\ 1 & -3 \end{pmatrix}$	10
ii)	What are the key categories used to classify visible surface detection algorithms, and how do they differ in their approach to solving the visibility problem in computer graphics?	10
iii)	Write a pseudo code to draw hyperbola(preferred OpenGL function based) (Hint: $[(x^2/a^2) - (y^2/b^2)] = 1$)	10

Que. No.	Question	Max. Marks
Q4	Solve any Two	20
i)	Preserving the aspect ratio, find a normalization from window whose lower left is at (0, 0) and upper right corner is at (20, 12) onto the normalized device screen, so that aspect ratios are preserved.	10
ii)	In the context of computer game development, how might the choice of visible surface detection method impact gameplay and user experience?	10
iii)	How are interactive programs animated to provide a dynamic and responsive user experience, and what are some techniques for achieving smooth animations in real-time graphics? Explain with respect to any Anime .	10



Que. No.	Question	Max. Marks
Q5	Solve any four(04)	20
i)	Write a short note on Image based rendering.	5
ii)	Write a short note on RGB colour model.	5
iii)	Write a short note on Zooming and Roaming	5
iv)	Write a short note on Isometric Projections.	5
v)	Find the form of the matrix for reflection about a line L with slope m and y intercept (0, b).	5
vi)	Compute the following c. Width of the image having height of 8 inches and aspect ratio 1.5. d. Height of the resized image 1024 x 768 to one that is 640 pixels wide with the same aspect ratio.	5

$$AR = \frac{w}{h}$$

$$1.5$$