Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2021

Subject Code:3151607 Date:09/09/2021

Subject Name:Computer Graphics and Visualization

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	State the use of GLUT.	**03**
	(b)	What is 2D viewing-transformation pipeline? Explain it briefly.	**04**
	(c)	Explain in details various applications of Computer Graphics.	**07**
Q.2	**(a)**	What is homogeneous coordinate? Why is it required?	**03**
	(b)	Define the following Frame Buffer, Pel, Resolution, Rasterization.	**04**
	(c)	Explain Parallel Projective Transformations.	**07**
		OR	
	(c)	What are Perspective Projective Transformations?	**07**
Q.3	**(a)**	Explain Wilier-Atherton polygon clipping algorithm's advantages over Sutherland Hodgeman polygon clipping algorithm.	**03**
	(b)	Give a detailed explanation of the phong and gouraud shading models	**04**
	(c)	With a help of a neat diagram, describe the Bressenham algorithm	**07**
		OR	
Q.3	**(a)**	Write the main principle behind the working of the BSP trees method.	**03**
	(b)	Explain scaling in 2D transformations.	**04**
	(c)	Write a note on Sutherland-Hodgeman Polygon Clipping	**07**
Q.4	**(a)**	List any 3 algorithms used for hidden surface /line detection	**03**
	(b)	Differentiate between Raster and Random Scan techniques	**04**
	(c)	When can Cohen Sutherland Clipping algorithm be used and how?	**07**
		OR	
Q.4	**(a)**	Describe pivot(fixed) point rotation.	**03**
	(b)	Explain the Polygon Filling Algorithms in details	**04**
	(c)	How does Nicholl-Le-Nicholl Clipping algorithm clip lines? Explain with an example.	**07**
Q.5	**(a)**	What is double buffering with respect to OpenGL?	**03**
	(b)	Explain the properties of B-spline curves	**04**
	(c)	Write a short note on Bezier Curves	**07**
		OR	
Q.5	**(a)**	Explain Marching Squares Algorithm	**03**
	(b)	Briefly explain Z-buffer visible surface determination algorithm.	**04**
	(c)	Write about the Ray Tracing Technique for displaying high quality graphics	**07**

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