

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 Bresenham 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
