Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020

Subject Code:3150712 Date:27/01/2021

Subject Name:Computer Graphics

Time:10:30 AM TO 12:30 PM Total Marks: 56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Define: 1) Aspect Ratio 2) Persistence 3) Frame Buffer.	**03**
	(b)	Consider a raster system with resolution of 1280 by 1024. What size of frame buffer is needed for given system to store 24bits per pixel? How many colors are possible in given system? What is the access time per pixel if refreshing rate is 60 frames per second?	**04**
	(c)	List differences between raster scan and random scan display.	**07**
Q.2	**(a)**	Write a short note on Light Emitting Diodes (LED)	**03**
	(b)	What is aliasing? Briefly explain various anti-aliasing techniques.	**04**
	(c)	Explain the property of circle and calculate the pixel position along circle path with radius r =10 centered on the origin using midpoint circle algorithm up to x=y.	**07**
Q.3	**(a)**	What is inside-outside test? List out the method for inside-outside test.	**03**
	(b)	Write short note on Boundary fill (8-connected) algorithm.	**04**
	(c)	Reflect the diamond-shaped polygon whose vertices are A(–1,0), B(0, –2),C(1,0) and D(0,2) about a line y=x+2.	**07**
Q.4	**(a)**	Write a short note on 2D Viewing Pipeline.	**03**
	(b)	Explain methods of character generation in brief.	**04**
	(c)	Prove that the multiplication of 2D transformation matrices for each of the following sequence of operations is commutative 1.Two successive rotations. 2. Two successive translations.	**07**
Q.5	**(a)**	State necessary conditions with explanation for geometric and parametric continuity.	**03**
	(b)	Write Short note on 1) 3D Rotation 2) 3D Translation 3) 3D Scaling.	**04**
	(c)	What is polygon clipping? Explain Sutherland-Hodgeman polygon clipping algorithm with the help of an example.	**07**
Q.6	**(a)**	Define Concave and Convex polygon with example. Also explain how to split concave polygon.	**03**
	(b)	What is projection? List out various types of projection.	**04**
	(c)	Clip the line PQ having coordinates P(4,1), and Q(6,4) against the clipping window having vertices A(3,2), B(7,2), C(7,6), and D(3,6) using Cohen Sutherland Line Clipping Algorithm.	**07**
Q.7	**(a)**	Write short note on RGB Color Model.	**03**
	(b)	Explain Bezier curve with necessary equations. List all properties of a Bezier curve.	**04**
	(c)	Explain z-buffer visible surface determination algorithm.	**07**
Q.8	**(a)**	Write short note on CMY Color Model.	**03**
	(b)	Discuss Specular refection and Phong Model.	**04**
	(c)	Give the classification of the visible surface detection algorithm. Explain any one with example.	**07**

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