Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2018

Subject Code:2160703 **Date:04/12/2018**

Subject Name:Computer Graphics

Time: 02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	List applications of Computer Graphics.	**03**
	(b)	Explain beam penetration technique for color display.	**04**
	(c)	Derive all equations for Bresenham's line drawing algorithm. Show all the necessary calculations for all the intermediate points for a line having endpoints as (1, 3) & (7, 9) using Bresenham's line drawing algorithm.	**07**
Q.2	**(a)**	Consider three different raster systems with resolutions of 640 x 480, 1280 x 1024 and 2560 x 2048. What size of frame buffer is needed for each of these systems to store 12 bits per pixel?	**03**
	(b)	Explain DVST in brief.	**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**
		OR	
	(c)	Apply the shearing transformation to Square with A(0,0), B(1,0), C(1,1) and D(0,1) as given below: 1) Shear parameter value of 0.5 relative to line Yref = -1 2) Shear parameter value of 0.5 relative to line Xref = -1	**07**
Q.3	**(a)**	What is convex hull? Explain its use in boundary representation.	**03**
	(b)	Explain what are inside – outside tests.	**04**
	(c)	What is aliasing? How to compensate the aliasing? Explain in detail.	**07**
		OR	
Q.3	**(a)**	Explain following terms : 1) Aspect ratio 2) Cubic spline 3) Window port	**03**
	(b)	Write a note on concave polygon and its splitting.	**04**
	(c)	Explain three methods of character generation.	**07**
Q.4	**(a)**	State the differences between 4 – Connected fill and 8 – Connected fill.	**03**
	(b)	Explain reflection in 2D transformations.	**04**
	(c)	Explain NLN clipping algorithm.	**07**
		OR	
Q.4	**(a)**	Differentiate the parallel and perspective transformation.	**03**
	(b)	Explain rotation in 2D transformations.	**04**
	(c)	Explain and write Liang Bersky line clipping algorithm.	**07**
Q.5	**(a)**	Explain RGB color model.	**03**
	(b)	Explain the term hue and saturation.	**04**
	(c)	List advantages of B-spline over Bazier splines. Explain B-spline curves.	**07**
		OR	
Q.5	**(a)**	Explain HSV color model.	**03**
	(b)	Explain following terms : 1) Dominant Frequency 2) Purity 3) Luminance 4) Frame buffer	**04**
	(c)	Explain Z-buffer algorithm.	**07**

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