

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 $Y_{ref} = -1$ 2) Shear parameter value of 0.5 relative to line $X_{ref} = -1$	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
