Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2016

Subject Code:2151603 **Date:09/05/2016**

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.**

Q.1	**(a)**	What is aliasing? How to compensate the aliasing? Explain in detail.	**07**
	(b)	1. Explain Beam penetration method.	**03**
		2. How long it would take to load a 640 x 400 frame buffer with 24 bits per pixel, If 10^6 bits can be transferred per second?	**02**
		3. Define: 1. Aspect ratio 2. Persistence	**02**
Q.2	**(a)**	Explain Scanline polygon fill algorithm in detail.	**07**
	(b)	Give advantages of Bresenham line drawing algorithm. Draw a line from (20,10) to (30,18) using it.	**07**
		OR	
	(b)	Discuss midpoint circle algorithm with example.	**07**
Q.3	**(a)**	Derive 2 X 2 transformation matrix for each of the following. (a) Rotation about origin. (b) Fixed point scaling.	**07**
	(b)	Clip the line using Liang Barsky algorithm against window with (xw_{min}, yw_{min})= (0,0) and (xw_{max}, yw_{max})=(100,50). Line end points are A(10, 10) and B(110, 40).	**07**
		OR	
Q.3	**(a)**	A triangle is defined by P(2, 2), Q(4, 2) and R(5, 5). Find the transformed coordinates after 90 degree clockwise rotation followed by reflection about line y = -x.	**07**
	(b)	Explain Cohen Sutherland line clipping algorithm with example.	**07**
Q.4	**(a)**	Explain the Bazier curves and surfaces.	**07**
	(b)	1. Explain parallel and perspective projections.	**04**
		2. Explain non zero winding rule.	**03**
		OR	
Q.4	**(a)**	What is window and view-port? Retrieve equation for the scaling factor to map the window to view-port in 2D viewing system.	**07**
	(b)	Derive 3D Rotation matrix.	**07**
Q.5	**(a)**	1. Define: Dominant frequency, Saturation, Luminance	**03**
		2. Explain various light sources.	**04**
	(b)	Explain CIE diagram with its usefulness.	**07**
		OR	
Q.5	**(a)**	Classify the visible surface detection algorithms. Explain Z buffer algorithm for hidden surface removal.	**07**
	(b)	Explain RGB and XYZ color models.	**07**

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