Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER VI– • EXAMINATION – SUMMER 2015

Subject Code: 160703 Date:08/05/2015

Subject Name: Computer Graphics

Time:10.30AM-01.00PM 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)**	Derive all formulas for Bresenham line drawing algorithm. Write a function Bresenhamline(x1, y1, x2, y2, type) so it draws line with specified type. If type=0, solid line, type=1 dashed line and type=2 dotted line	**07**
	(b)	Derive all formulas for mid-point circle drawing algorithm. Apply algorithm and find out points for circle with radius 8 and centre (0.0) for one octant only	**07**
Q.2	**(a)**	Briefly explain different methods to generate thick lines. Discuss merits and demerits of each method.	**07**
	(b)	What is frame buffer? How long would it take to load a 640 by 480 frame buffer with 12 bits per pixel if transfer rate is 1Mbps? What is the size of frame buffer? How many colors it support?	**07**
		OR	
	(b)	Briefly explain scan line polygon filling algorithm. Explain the fields of edge table and criteria for adding and removing edge to active edge table.	**07**
Q.3	**(a)**	Briefly explain NLN line clipping algorithm. What are the advantages of NLN over cohen Sutherland line clipping algorithm	**07**
	(b)	Prove that successive rotation is additive and commutative	**07**
		OR	
Q.3	**(a)**	Briefly explain cyrus back line clipping algorithm. Compare cyrus back and liang basky line clipping algorithm	**07**
	(b)	Determine the transformation matrix which reflects given object about diagonal y=x	**07**
Q.4	**(a)**	Consider square with left-bottom corner at (2, 2) and right-top corner at (6, 6). Find out the transformation matrix which makes its size half such that its centre remains same.	**07**
	(b)	Define polygon mesh. Briefly explain different methods used to represent polygon mesh with example	**07**
		OR	
Q.4	**(a)**	Consider a triangle with vertices A(1,1), B(5,2) and C(3,4). Find out the transformation matrix which rotates given triangle about point C (3,4) by an angle 30 clockwise. Also find rotated triangle.	**07**
	(b)	Compare persepective and parallel projection. Briefly explain different types of parallel projections	**07**
Q.5	**(a)**	Classify the visible surface determination algorithm. Briefly explain z-buffer visible surface determination algorithm	**07**
	(b)	Briefly explain diffuse and specular reflection.	**07**

OR

Q.5	**(a)**	Briefly explain different techniques to make visible surface determination algorithm more effective. Briefly explain back face culling algorithm.	**07**
	(b)	(1) Briefly explain LCD and LED display	**04**
		(2) Briefly explain CMY color model	**03**

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