[Time: 3 Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B: 1. Question number one is compulsory.

2. Attempt any three from remaining five questions.

3. Assume any suitable data if necessary and justify the same.

Q.1	a)	State the various applications of computer graphics. Explain anyone in detail	**05**
	b)	List the various 2 D transformations used in graphics systems. Explain anyone in detail	**05**
	c)	Specify the mechanism of converting window to viewport coordinate transformation	**05**
	d)	Explain the various polygon rendering models used in computer graphics.	**05**
Q.2	a)	Rasterize a line segment using Bresenham's line drawing algorithm where starting coordinates of line segment are Pl(5,5) and ending coordinates are P2(13,9) . Further differentiate between DDA and Bresenhams line drawing algorithm.	**10**
	b)	Define Boundary and Flood fill mechanism. Explain 8-connected flood fill mechanism in detail.	**10**
Q.3	a)	State the how the visible surface detection algorithms are classified. Explain Back Surface detection method in detail with an example	**10**
	b)	Explain mid-point circle drawing algorithm. Using mid-point circle algorithm plot the circle whose radius = 10 units.	**10**
Q.4	a)	Explain Cohen Sutherland line clipping algorithm. Apply the algorithm to line with coordinates pl(xl,yl) = (2, 2) and p2(x2,y2)=(12, 9) against the window (xwmin,ywmin) = (4, 4) and (xwmax, ywmax) = (9, 8).	**10**
	b)	Define what is meant by Bezier curve. Explain its properties and further differentiate between Bezier and B spline curve.	**10**
Q.5	a)	Explain Parallel and Perspective "projection? Derive the matrix for perspective projection	**10**
	b)	Explain Sutherland Hodgman polygon clipping algorithm with example. Also clearly state its drawback	**10**

Q.6 Write short notes on **(Any Two)** **20**

    a) Illumination models

    b) Half tone and Dithering techniques

    c) Fractals

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