

[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 P1(5,5) and ending coordinates are P2(13,9) . Further differentiate between DDA and Bresenham's 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 $p1(x1,y1) = (2, 2)$ 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)

- Illumination models
- Half tone and Dithering techniques
- Fractals

20
