Atal Bihari Vajpayee Indian Institute of Information Technology & Management, Gwalior

IT303: Computer Graphics

Major Examination (Session 2023–24)

Maximum Time: 3 Hours   Max Marks: 45

Note: Answer all questions. Diagrams should be neat and clear for full credit.

1. (a) Explain in detail the DDA line drawing algorithm with an example. (b) Compare it with the Bresenham algorithm. (7 Marks)

2. (a) Describe the midpoint circle drawing algorithm. (b) Illustrate its steps for drawing a circle of radius 8 units. (8 Marks)

3. (a) Derive the 2D transformation matrices for scaling, rotation, and reflection. (b) Apply a sequence of transformations to rotate a point $(2, 3)$ by 90° and then translate it by $(1, 2)$. (8 Marks)

4. (a) What is clipping in computer graphics? Explain Cohen–Sutherland line clipping algorithm. (b) Show an example of clipping a line against a rectangular window. (7 Marks)

5. (a) Explain the concept of 3D transformations. (b) Derive the perspective projection matrix. (8 Marks)

6. Write short notes on any two: (i) Antialiasing techniques (ii) Hidden surface removal methods (iii) Shading models in computer graphics (7 Marks)