

EX/IT/T/215/2018

BACHELOR OF ENGG. INFORMATION TECHNOLOGY EXAMINATION, 2018
(2 nd Year, 1st Semester)
Computer Graphics

Time: 3 hrs.

Full Marks: 100

Answer any Four Questions

1. a) Derive the transformation matrix for rotation about $2x+3y = 0$. (10)
b) Describe Bresenham Line Drawing Algorithm for drawing $5x + 3y + 6 = 0$. Discuss aliasing effect on this(10 +5)

2. a) Define Homogeneous Coordinate system? Why this is important in Computer Graphics? (4 + 4 = 8)
b) Write mechanism(s) by which an image of the face of a person can be made (i) distorted (ii) looking slender (iii) looking sharper? Give reasons for your answer. (4 + 4 + 4 = 12)
c) Prove that reflection about an axis (X or Y) can be done with only translation. Hence write the required transformation matrix. (3 + 2 = 5)

3. a) What are convex and concave polygons. Maximum how many points a straight line can cut a (i) convex polygon and (ii) concave polygon. (Justify. Do not consider the case when the line coincides with some edge.) (4+4+5+5)
b) Show that scaling and rotation by angle θ , about origin, are commutative, when, $\theta = n\pi$ or $S_y = S_x$.(7)

4. a) Describe Z buffer algorithm. (15)
b) Write a line clipping algorithm when the view port is a rectangle. (10)

5. a) Derive the transformation matrix for perspective projection w.r.t center of projection (-5,8). (15)
b) Derive CMY color model from RGB color model. (10)