Presentation: 11 Nov

SIMAD University
Computer Science Department
Computer Graphics
Sample Midterm Examination
[30% Marks]

Student Name_____ID#:____

Attention: This Test contains 7 questions Attempt any 6 only. [6 x 5.0 = 30 Marks].

Questions

1. Using DDA Line drawing algorithm with Δx = -1,
   a. Prove that $y_{k+1} = y_k - m$
   b. Draw DDA Line with coordinates A(2,2), B(6,4) by hand
   c. Write code for DDA Line drawing algorithm

[5 Marks]

2. Using slope-intercept line equation with slope 6 and point (-2, 3)
   a. Show the linear equation as 2D
   b. Show the linear equation as 3D
   c. Draw the 2D straight line by hand
   d. Draw the 3D plane by hand
   e. Plot the 2D straight line by Python

[5 Marks]

3. Using Bresenham's Line drawing algorithm,
   a. prove that $p_k = 2\Delta y x_k - 2\Delta x y_k + C$
   b. prove that $p_{k+1} = p_k + 2\Delta y - 2\Delta x$ provided that $(y_{k+1} - y_k) = 1$
   c. Draw coordinates line from pixel $A(1,1)$,to pixel $B(7,5)$.
   d. Write Bresenham's Line drawing code

[5 Marks]

4. True / False:
   a. Identifying the center and radius of the circle $(x + 1)^2 + y^2 = 4$, the center=(-1, -3) and radius=2 [____]

b. Using 3D Plane drawing concept, the 3D points to be plotted of the following equation is $(5, -\frac{13}{5}, -\frac{4}{5})$[_____]

$$2x - 6y - z = -38$$
$$-3x - y + 7z = -34$$
$$-8x + y - 2z = -20$$

[5 Marks]

5. Identify
   a. Center, radius and then draw the graph of this circle$(x + 1)^2 + (y + 3)^2 = 4$
   b. Radius, the circle equation and then Draw the circle with center (-3, 3) and a point (2, 8)

[5 Marks]

6. Using slope-intercept line equation with slope 4 and point (1, -2)
   a. Show the linear equation
   b. Draw the straight line by hand
   c. Prove that $y = mx + c$ is extendable to formula of $dyx - dxy + C$

[5 Marks]

7. Using 2D Concept, Plot the triangle [A (10, 10), B (15, 15), C(20, 10)] and then Translate the triangle 3 unit in x direction and 2 unit in y direction. Show tour plotting before and after translation.

[5 Marks]

End of Sample Midterm