



EASTERN UNIVERSITY, SRILANKA

THIRD EXAMINATION IN SCIENCE-2005/2006

THIRD YEAR/SECOND SEMESTER IN SCIENCE-I(March/April-2008)

CS301 – Computer Graphics

Answer all questions

Time: 2Hours

Q1)

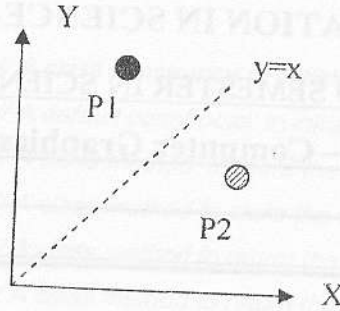
1. With the aid of a diagram explain how the Video Display Device works. [Marks 15]
2. What is meant by Raster-Scan Display and Random-Scan Display? [Marks 15]
3. Explain the **Bresenham Line Drawing Algorithm** and prove all necessary formula. [Marks 40]
4. Using the above Line Drawing Algorithm calculate the successive pixel positions of the line with endpoints $p_1(1,1)$, $p_2(12,6)$ in order to plot in the display. [Marks 30]

Q2)

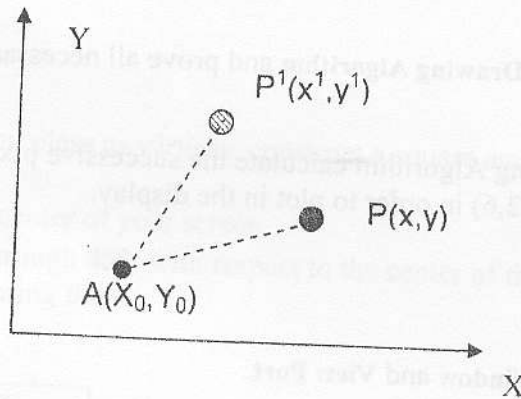
1. Define the graphics terms **Window** and **View Port**. [Marks 10]
2. Explain the **MIDPoint Circle drawing algorithm** and prove all necessary formula in order to use this algorithm. [Marks 50]
3. Using the above circle drawing algorithm compute the successive pixel positions to plot in the display in order to draw the first quarter of the circle with center at $c(10,10)$ and radius 10. [Marks 40]

Q3)

- Describe all basic transformations that would be useful in two-dimensional graphics and give the transformation matrices for all. [Marks 2]
- Give the transformation matrix to find the mirror (reflection) image of $p1$ with respect to the line $y=x$. [Marks 3]

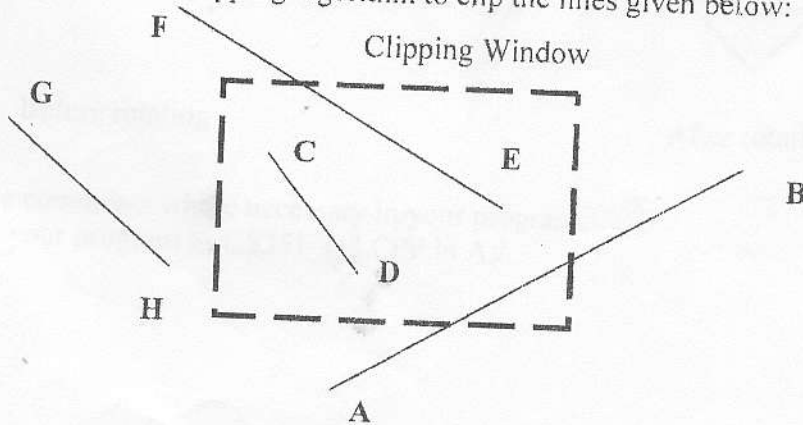


- Consider the coordinate system given below. Let $A(X_0, Y_0)$ is a pivot point. The point $P^1(x^1, y^1)$ is obtained by rotating the point $P(x, y)$ by an angle α with respect to the point $A(X_0, Y_0)$. Get the transformation matrix of p^1 using composite transformation. [Marks 50]



Q4)

- What is meant by Clipping in Computer Graphics? [Marks 10]
- Briefly explain the 4 clipping Primitive Types. [Marks 20]
- Explain the **Cohen-Sutherland Line Clipping Algorithm**. [Marks 40]
- Using the above Line Clipping algorithm to clip the lines given below:



[Marks 30]