EASTERN UNIVERSITY, SRILANKA

THIRD EXAMINATION IN SCIENCE –2007/2008

FIRST SEMESTER (Dec. /Jan. 2008)

CS 301 – COMPUTER GRAPHICS

(PROPER & REPEAT)

Answer all questions **Time allowed: 02 hours**

Q1

a) Briefly describe the **Refresh Cathode – Ray Tubes.**

b) Define the following terms:

i. Modeling Coordinates;

ii. World Coordinates;

iii. Normalized Coordinates;

iv. Device Coordinates.

c) Explain **DDA** (Digital Differential Analyzer) algorithm to generate straight lines.

d) How can you improve the performance of this algorithm?

Q2

a) Explain **Breshenham's** line drawing algorithm to generate straight lines with the slope less than one.

b) Describe how you could use your algorithm to draw straight lines with all cases of slope.

c) Illustrate **Breshenham's** line drawing algorithm for the line with endpoints (20, 10) and (30, 18).

d) Using mid point circle algorithm compute successive points to plot in the display in order to draw the first quarter of the circle from x=0 to x=y and radius r=10.

Q3

a) Describe the ***rotation*** of a point about origin and arbitrary pivot point that would be useful in two dimensional graphics.

b) Illustrate a two dimension at transformation sequence to produce ***scaling*** with respect to a selected fixed position (x_f, y_f) using the scaling matrix $S(s_x, s_y)$.

c) Define the graphics terms **window** and **viewport.**

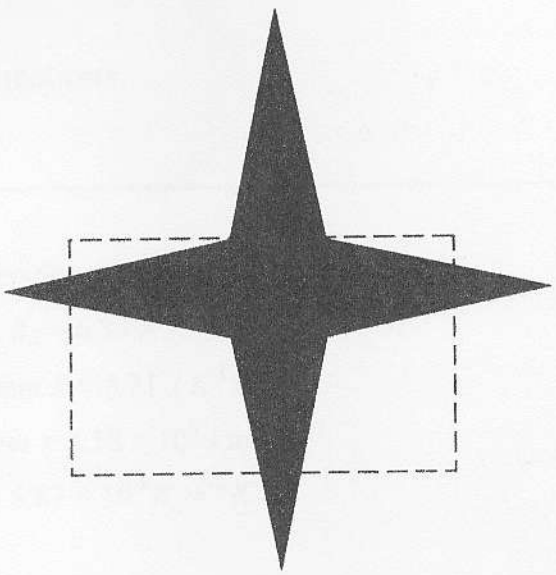
d) Briefly describe two dimensional **viewing transformation pipeline**.

Q4

a) What is meant by clipping in computer graphics and briefly explain the 3 clipping Primitive types.

b) Explain the **Cohen – Sutherland Line Clipping** algorithm.

c) Use the **Cohen – Sutherland Polygon Clipping** algorithm to clip the polygon given below.



d) Give the equation for three – dimensional rotation about z-axis by an angle θ. Deduce the equation for rotations about x-axis and y-axis from the equations.