KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

SCE 417: COMPUTER GRAPHICS

DATE: Thursday 19th April, 2012 **TIME:** 11.00 a.m. – 1.00 p.m.

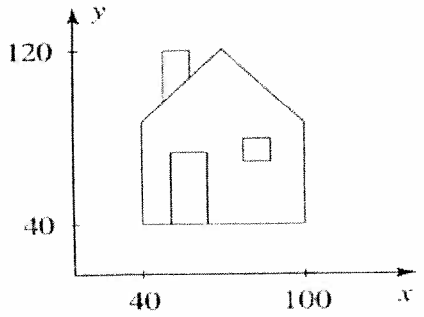
INSTRUCTIONS: *Answer question ONE and any other TWO questions.*

Question 1 (20 marks)

a) Define the terms
   a. computer graphics (3 marks)
   b. Pixel (3 Marks)
   c. Aligned rectangles (3 marks
b) What is device-independent-programming? (3 marks)
c) List the OpenGL statements that can define the coordinate reference frame for a viewport in display window whose x axis has values ranging from -150 to 150 and y axis has values ranging from -100 to 100 pixels. (4 marks)
d) Distinguish between GL_LINE_LOOP and GL_LINE_STRIP (4 Marks)

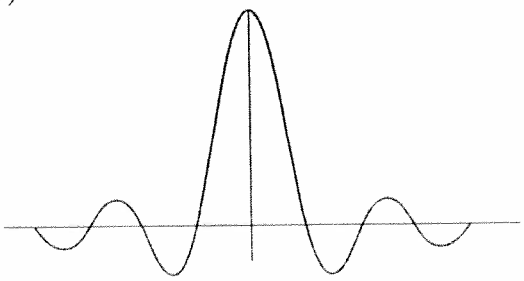
Question 2 (20 Marks)

a) Most windows-based programs are events driven. Explain. (3 marks)
b) Explain the purpose of the following codes in an OpenGl program (6 Marks)
   i) # include <gl\gl.h>
   ii) # include <gl\glu.h>
c) Graphically explain how an image is created and displayed (5 marks)
d) Write a routine to draw the following figure (6 marks)



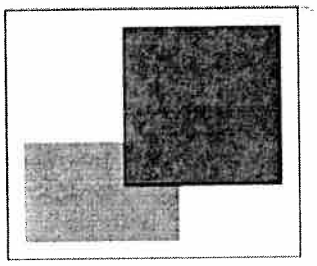
Question 3 (20 Marks)

a) Define the term polygon clipping (3 Marks)
b) Outline the function of the header file windows.h. (3 Marks)
c) Distinguish between lineto() and moveto commands (4 Marks)
d) Distiguish between a Valuator and Locator (4 Marks)
e) Write a function that can draw the following sinc curve (6 Marks)



Question 4 (20 Marks)

a) When is a polygon convex? (3 Marks)
b) Define "output primitives" List the four basic output primitives. (4 Marks)
c) Discuss the three principal sources of raster images (6 Marks)
d) Write openGl codes that can draw the following aligned rectangle (use different colour codes to distinguish them) (7 Marks)



Question 5 (20 Marks)

a) Distinguish between glVertex2i() and glVertex*(). (4 Marks)
b) Discuss all the parameters in the following prototype (6 Marks)

```
void myMouse(int button, int state, int x, int y);
```

c) Write a routine that can place three thick dots on the screen (5 Marks)
d) Find the values of A, B, C, and D given that the world window and viewport are defined by (-10.0, 10.0, -6.0 , 6.0) and (0, 600, 0, 400) respectively. (5 Marks)