



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2010/2011

**FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE (COMPUTER SCIENCE)**

SCS 314: COMPUTER GRAPHICS

DATE: FRIDAY 3RD DECEMBER 2010

TIME: 11.00 A.M. - 1.00

P.M. INSTRUCTIONS: Answer Question one and any other two from the following paper.

QUESTION ONE (30 MARKS)

(a). (i). Define Computer Graphics

(ii). By using examples, explain four applications of computer graphics.

(10 marks)

(b). With the aid of a well labeled diagram, describe how a Cathode-Ray Tube (CRT) works.

(10 marks)

(c). (i). Explain the purpose of the following codes in an OpenGL program

(i). `#include <windows.h>`

(ii). `#include <gl\gl.h>`

(iii). `#include <gl\glu.h>`

(iv). `#include <gl\glaux.h>`

(ii). what is an application programming interface (API)

(10Marks)

QUESTION TWO (15 MARKS)

(a.) (i). 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.

(ii). From (i.), give the coordinates of the top – left corner of the viewport.

(4 marks)

(b.) Consider the following preprocessor directives as used in a graphics application and answer the questions that follow:

`#include <windows.h>`

`#include <GL/gl.h>`

`#include <GL/glu.h>`

(i). Outline the function of the header file windows.h.

- (ii). Why do you think the preprocessor directive `#include <windows.h>` is the first directive in the list above.
- (iii). When is it important to list all the three preprocessor directives in a graphics application? Outline.

(5 marks)

- (c.) Outline the meaning of each of the following symbolic constant as used in drawing line segments:

- (i). `GL_LINES`
- (ii). `GL_LINE_LOOP`
- (iii). `GL_LINE_STRIP`

(6 marks)

QUESTION THREE (15 MARKS)

- (a). What is an additive colour model?

(3 marks)

- (b). Name three different types of coordinate systems used in computer graphics. (8 marks)

- c) What is the main function of a graphical processor?

(4 marks)

QUESTION FOUR (15 MARKS)

- (a). What is the rendering process as used in computer graphics?

(2 marks)

- (b). Describe the following physical input devices;

- i) Data tablets
- ii) Lightpen
- iii) Joystick
- iv) Track ball

(8 marks)

- (c). Explain the differences between the OpenGL core library and the OpenGL Utility.

(5 marks)

QUESTION FIVE (15 MARKS)

- (a). State and briefly describe the five classes of logical input devices used in computer graphics.

(9 marks)

- (c). Clearly explain the following OpenGL constants:

- (i). `GL_POLYGON`
- (ii). `GL_TRIANGLES`
- (iii). `GL_QUADS`

(6 marks)