KENYA METHODIST UNIVERSITY
FIRST TRIMESTER EXAMINATION, APRIL 2008

FACULTY	**:**	**SCIENCE AND SOCIAL STUDIES**
DEPARTMENT	**:**	**COMPUTER AND INFORMATION SCIENCE**
COURSE CODE	**:**	**COMP 430**
COURSE TITLE	**:**	**COMPUTER GRAPHICS**
TIME	**:**	**2 HOURS**

Instructions:

Answer ALL questions in Section A and any other TWO questions in Section B.

Section A (30 Marks)

i) Briefly describe the following terms:

   a. Aspect Ratio
   b. Bundled Primitives
   c. Light
   d. Anti-aliasing. (4 Marks)

ii) Describe any three graphics applications. (3 Marks)

iii) What is the difference between:

   a. Window and a viewport. (2 Marks)
   b. Object space methods and image space methods. (2 Marks)
   c. Random scan display and raster scan display. (4 Marks)

iv) With the help of a well labeled diagram, briefly describe the operating characteristics of an LCD. (6 marks)

v) What is the significance of the chromaticity diagram? (4 Marks)

vi) Describe the three input modes which specify how programs and input devices interact. (3 Marks)

vii) List any four geometric transformations. (2 Marks)

Section B

Question One (20 Marks)

i) Describe and outline the steps in the Bresenham's midpoint algorithm for drawing an ellipse. (12 Marks)

ii) Describe at least two different classes of logical input devices? (4 Marks)

iii) Describe any two color models. (4 Marks)

Question Two (20 Marks)

i) Describe the Liang Barsky clipping algorithm. (5 Marks)

Determine the new end points for a line P0 (30, 20) and P1 (280,160) on a clipping window (70, 60) and (230,150). (5 Marks)

viii) Verify that two successive rotations are additive. (4 Marks)

ix) Define the following terms:

a. Frame buffer

b. Persistence (2 Marks)

x) Describe the steps to accomplish the rotation about an axis that is not parallel to any one of the coordinate axes. (4 Marks)

Question Three (20 Marks)

i) Describe at least four considerations you would take into account when developing a graphical user interface. (4 Marks)

ii) Consider two rater systems with resolutions 640 by 480 and 1280 by 1024. What size frame buffer (in bytes) is needed for these two systems to store 12bits per pixel? How much storage is required for each system if 24 bits per pixel are to be stored? (5 Marks)

iii) List two attributes for the curve output primitive. (2 Mark)

iv) Prove that the multiplication of 3-dimension transformations matrices for each of the following sequence of operations is commutative:

c. Any two successive translations

d. Any two successive scaling operations

e. Any two successive rotations about any one of the coordinate axes. (9 Marks)