AFRICA UNIVERSITY
A United Methodist-Related Institution

COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

CSC 300 COMPUTER GRAHICS

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER/DECEMBER 2019

LECTURER: MR A.C MUZENDA

DURATION: 3 HOURS

INSTRUCTIONS

Answer all Questions in Section A and any three questions from Section B
Total possible mark is 100

Start **each** question on a new page in your answer Booklet.

The marks allocated to **each** question are shown at the end of the section.

SECTION A [40 marks]

Answer all questions in this Section

QUESTION ONE

i. Explain the following terms as they are used in Computer graphics;
   a. Resolution. [2]
   b. Persistence [2]
   c. Frame buffer [2]

ii. What is a dot size? [2]

iii. Explain out the methods used for smoothly joining two line segments. [4]

iv. Briefly describe the differences between gourand shading and flat shading.[6]

v. Define texture mapping and explain the most commonly used methods. [6]

vi. Write brief notes about the following transformations.
   a. Reflection [3]
   b. Shear [3]

vii. List and explain the applications of Computer Graphics. [4]

viii. List out the merits and demerits of Penetration techniques [6]

SECTION B (60 MARKS)

Answer any three questions

QUESTION TWO

a. How is 3D viewing implemented? Explain the importance of the four steps in the 3d viewing pipeline. [10]

b. Explain the steps involved in Bresenham algorithm for line drawing. Demonstrate with an example. Discuss its merits and demerits [8]

QUESTION THREE

a. A rectangle ABCD with coordinates, A(0;0), B(0;1), C(1;1) and D(1;0) has been transformed. Find the resultant matrix;

i. Rotating the rectangle by 45^0 and translating by (2;0) [6]

ii. Draw the resultant diagram for the problem above. [4]

b. What are the hardware devices used for computer graphics? [4]

c. What is the difference between impact and non-impact printers? [6]

QUESTION FOUR

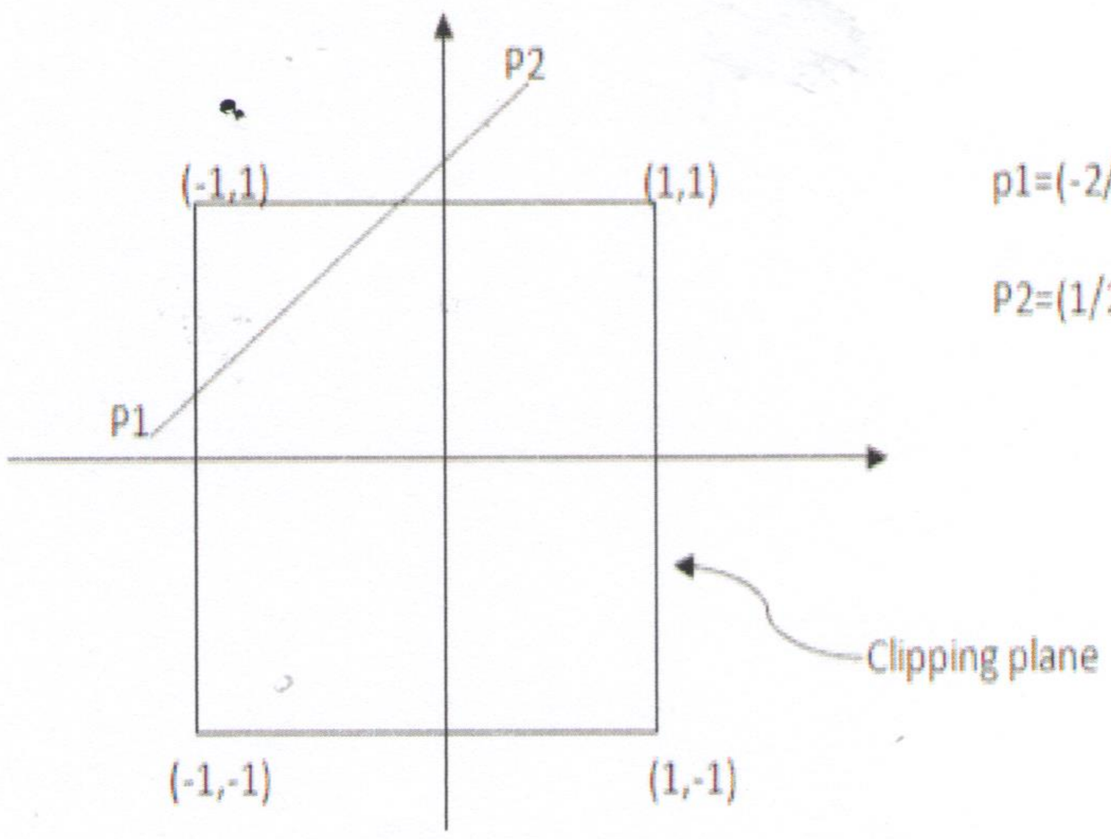
a. Describe in detail the shadow-mask method for CRT displays highlighting how different colors can be formed. [8]

b. Explain what is aliasing? Discuss two antialiasing methods. [6]

c. Distinguish between convex and concave polygons. [6]

QUESTION FIVE

a. Provide the details of clipping the following lines using the Cohen-Sutherland line clipping algorithm. Derive the out codes for each end-point, and determine the segments that will be trivially rejected/accepted. In case where a trivial rejection/acceptance is not possible, indicate where the line be clipped and explain how the resulting clipped segments will be processed. [14]



p1=(-2/3,1/6)

P2=(1/2,2/3)

b. Write short notes on active and passive transformations? [6]

THE END