MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2019/2020 ACADEMIC YEAR

SCHOOL OF SCIENCE AND INFORMATION SCIENCES

FOURTH YEAR SEMESTER I EXAMINATIONS FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COURSE CODE: COM 4107

COURSE TITLE: COMPUTER GRAPHICS

DATE: 10ᵀᴴ DECEMBER, 2019   **TIME: 1430 – 1630 HRS**

INSTRUCTIONS TO CANDIDATES

ANSWER Question **ONE** and any other **TWO**

QUESTION ONE (COMPULSORY) [30 MARKS]

a. Explain the following terms in relations to Computer Graphics
    i. View Volume
    ii. Horizontal Retrace
    iii. Resolution
    iv. Vector graphic

    [8 marks]

b. LCD's technologies allow displays to be much thinner when compared to cathode ray tube (CRT) technology. Discuss this phenomena

    [4 Marks]

c. Explain the basic graphic primitives for drawing in computer graphics:

    [6 marks]

d. Derive clearly while explaining your steps, the algorithm DDA as used in line generation in Computer graphics. Deduce pseudo code to support your derivation.

    [12 Marks]

QUESTION TWO [20 MARKS]

a. Write a python program to implement the digital difference anaylzer algorithm and explain your code along the algorithm

    [12 Marks]

b. Using a diagram, discuss the graphic pipeline and the processes involved in it.

    [8 Marks]

QUESTION THREE [20 MARKS]

a) A triangle is defined by the following vertices A (2,3) , B(2,4), C(3,3). Perform the following transformations.

   i. Translate the triangle in space by 3 units in x-direction and 4 units in y-direction. **[3 Marks]**

  ii. Scale the original triangle by factor of 1.5

[2 Marks]

  iii. Rotate the original triangle by 35^0 about the origin.

[3 Marks]

b) Find the reflection of the point (2, 10) about the line y=4x+5.

[12 Marks]

QUESTION FOUR [20 MARKS]

a. Wireframe modeling is the process of visual presentation of a three-dimensional or physical object used in 3-D computer graphics. Explain the merits of wire-frame modelling. **[8 Marks]**

b. Given a circle radius *r=14*, demonstrate the mid-point circle algorithm by determining the positions along the circle octants in the first quadrant from *x=0 to x=y.*

[12 Marks]

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