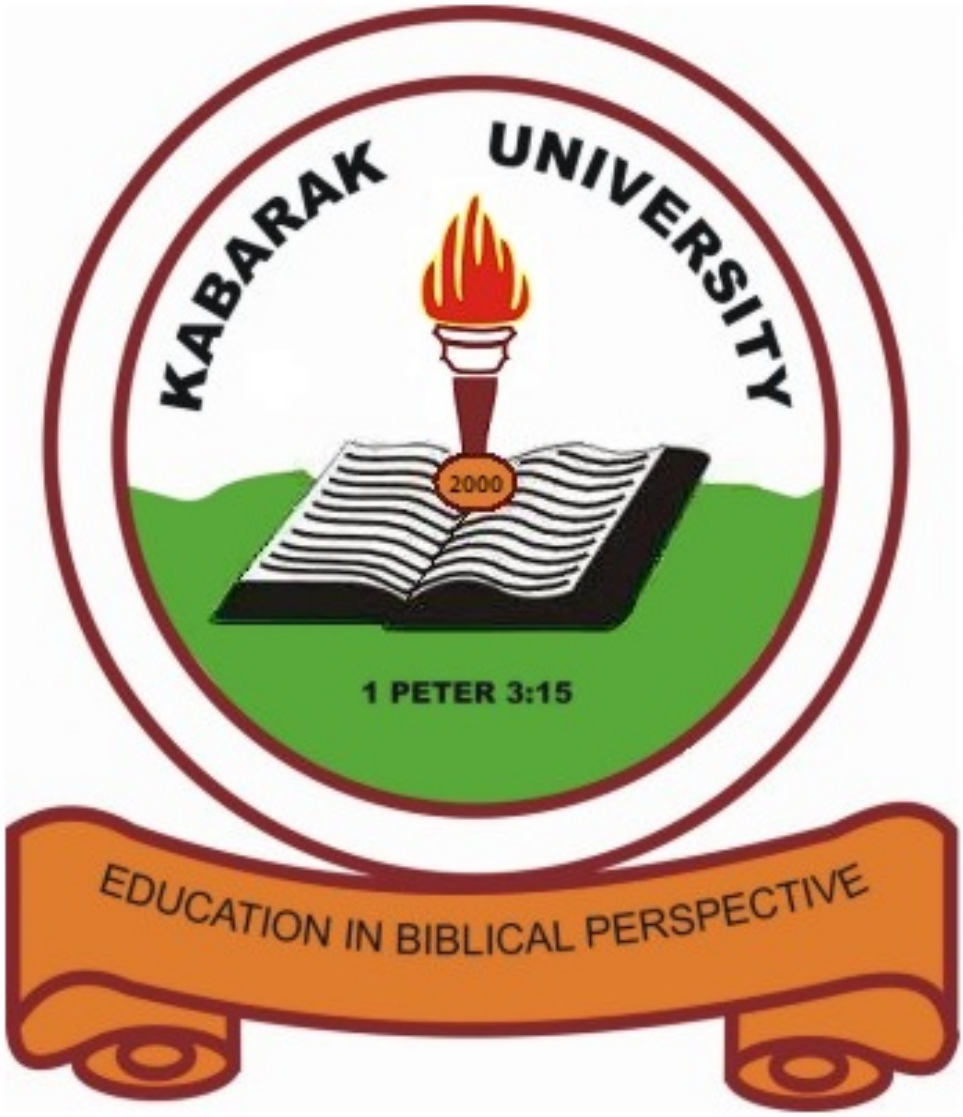
COMP 410 INTE 311 COSF COMPUTER GRAPHICS

kabarak university



Released August 2021

KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

MAIN CAMPUS

SECOND SEMESTER 2020/2021 ACADEMIC YEAR EXAMINATION FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE, BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY, BACHELOR OF SCIENCE IN SECURITY AND FORENSICS

COMP 410 INTE 311 COSF COMPUTER GRAPHICS

STREAM: BSC CS Y4S1 TIME: 9:00-11:00AM

EXAMINATION SESSION: MAY-AUGUST DATE: 23/08/2021

INSTRUCTIONS TO CANDIDATES

1. **Answer Question 1 and any other two questions in the answer booklet provided.**
2. **Do not write on your question papers. All rough work should be done in your answer booklet.**
3. **Clearly indicate which question you are answering.**

4. **Write neatly and legibly.**
5. **Edit your work for language and grammar errors.**
6. **Follow all the instructions in the answer booklet**

SECTION A: (COMPULSORY) TOTAL MARKS FOR THIS SECTION IS 30.

1.

a. With the aid of a diagram draw the DDA Algorithm and calculate the points between the starting point P(5, 6) and ending point Q(13, 19). **(8 Marks)**

b. A polygon has 4 vertices located at A (25,10), B (15,10), C (25,30), D (15,30). Calculate and indicate a transformation matrix double the size of the polygon with point A located at the same place and the resulting set of vertices. Show your work clearly. **(6 Marks)**

c. Differentiate an **Emmisive** display from a **Non-emmisive** one. **(2 Marks)**

d. Write a note on the two principal applications of image processing. **(4 Marks)**

e. A Triangle is formed by the points A (6,6), B (12,12), C(12,6). Calculate the resulting points of the triangle when we do the following transformations on a two-dimensional graphics screen.

   i. Rotation about an arbitrary point P (12, 20), 25^0 Anti-Clockwise. **(6 Marks)**

   ii. Scaling where the scaling factor is -3.5 and -1.5 along the x and y axis respectively. **(4 Marks)**

1.

a. A point Q(x,y) is to be moved through an angle Q clockwise about a point P(x,y), What will be the sequence of operations? **(4 Marks)**

b. Calculate the points of a line from P (3, 2) to Q (7,9) using Bresenham algorithm. **(6 Marks)**

c. Discuss the Four Bit Code and how it is used in Line Clipping with the aid of a suitable illustration. **(6 Marks)**

d. Explain the following concepts

i. Phosphorescence **(2 Marks)**

ii. Persistence **(2 Marks)**

3.

a. Write a note on the Mid-Point Subdivision Algorithm. Use relevant illustrations. **(6 Marks)**

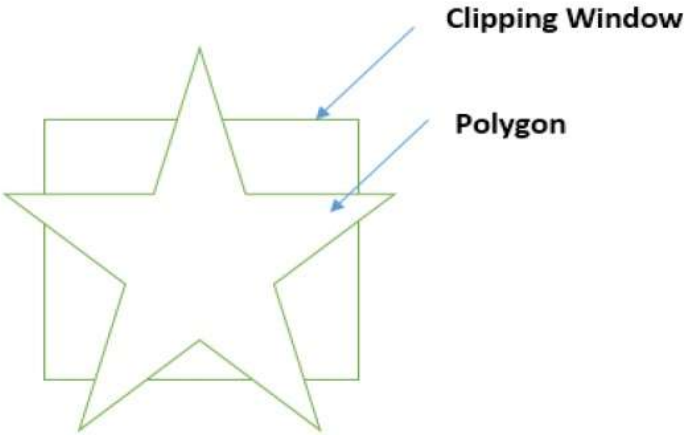
b. Differentiate between Clipping and Windowing. Use relevant illustrations. **(4 Marks)**

c. A polygon has 4 vertices located at **A** (20,10), **B** (30,10), **C** (35,30), **D** (20,30). Indicate a transformation matrix half the size of the polygon with point **A** and **B** located at the same place and the resulting set of vertices. Show your work clearly. **(6 Marks)**

d. Describe the components of the Conceptual Framework for Interactive Graphics with the aid of a well labelled diagram. **(4 Marks)**

4.

a. Describe how you would clip line the polygon from the following figure using the Cohen Sutherland Polygon ClippingAlgorithm **(8 Marks)**



b. Explain the difference between the two graphic types and provide an example where each type is best suited **(2 Marks)**

c. Describe how you would rotate a point p(x,y) about an arbitrary point q(x,y) 45clockwise. **(5 Marks)**

d. Describe the how a DVST works with every of its constituent components. **(5 Marks)**

5.

a. Kamau is working on a new project of designing a GUI for some Application. What input facility can you advise him to use in handling inconsistency of input in his design? **(6 Marks)**

b. Describe the functionality of the components that make up the Refresh CRT. **(4 Marks)**

c. Explain any four qualities of a good Line Drawing Algorithm. **(8 Marks)**

d. Differentiate between a Geometric System and a Co-ordinate System. **(2 Marks)**