



Kasarani Campus  
Off Thika Road  
P. O. Box 49274, 00101  
NAIROBI  
Westlands Campus  
Pamstech House  
Woodvale Grove  
Tel. 4442212  
Fax: 4444175

**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATIONS, 2024/2025 ACADEMIC YEAR**  
**THIRD YEAR, FIRST SEMESTER EXAMINATION**  
**FOR THE DEGREE OF BACHELOR OF SCIENCE IN MATHEMATICS**  
**KCS 2310 COMPUTER GRAPHICS**

**Date: 14<sup>TH</sup> AUGUST, 2024**  
**Time: 8:30 AM – 10:30 PM**

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE: COMPULSORY (30 MARKS)**

- a) Given a point with coordinates (2, 4). Apply the translation with distance 4 towards x-axis and 2 towards the y-axis. Find the new coordinates without changing the radius?  
(4 Marks)
- b) Define the term Kinematics as used in computer graphics? (2 Marks)
- c) With two examples for each, describe the two classes of input devices (4 Marks)
- d) The process of producing 3D animations is divided into three parts, demonstrate their functions (6 Marks)
- e) With the use of a diagram, discuss the parts that make up a display processor. (5 Marks)
- f) Giving examples of each, discuss the three basic classes of transformations. (3 Marks)
- g) Demonstrate the 3 possibilities for the line when using the Cohen-Sutherland Line Clippings algorithm. (6 Marks)

**QUESTION TWO: (20 MARKS)**

- a) With the aid of diagrams, differentiate random scan display and raster scan display with illustrations. (8 Marks)
- b) Explain the Types of parallel projection as used in Computer Graphics (6 Marks)
- c) Explain the two polygon filling methods. (6 Marks)

**QUESTION THREE: (20 MARKS)**

- a) Illustrate how window to viewport transformation is achieved with an aid of diagram.  
(6 Marks)
- b) With the aid of an illustration, describe the working of the parts of a CRT monitor.  
(10 Marks)
- c) Explain four software used in 3D animation.  
(4 Marks)

**QUESTION FOUR: (20 MARKS)**

- a) Using illustrations, demonstrate the Cohen-Sutherland Line Clippings algorithm  
(8 Marks)
- b) Discuss the three anomalies that may occur in perspective projection showing the occurrence with the aid of diagrams.  
(9 Marks)
- c) Explain the need for understanding the human visual system when studying computer graphics.  
(3 Marks)

**QUESTION FIVE: (20 MARKS)**

- a) Various techniques are used to provide text clipping in computer graphics. It depends on the methods used to generate characters and the requirements of a particular application. Describe the three methods for text clipping using illustrations. (6 Marks)
- b) A point has coordinates P (1, 2, 3) in x, y, z-direction. Apply the translation with a distance of 2 towards x-axis, 3 towards y-axis, and 4 towards the z-axis. Find the new coordinates of the point?  
(6 Marks)
- c) Morphing is an animation function which is used to transform object shape from one form to another. Elaborate the steps that are involved in the process of morphing.  
(8 Marks)