

**KENYA METHODIST UNIVERSITY**  
**END OF FIRST TRIMESTER 2007 EXAMINATIONS**

**DEPARTMENT : MATHEMATICS AND COMPUTER SCIENCE**  
**COURSE CODE : COMP 430**  
**COURSE TITLE : COMPUTER GRAPHICS**  
**TIME : 2 HOURS**

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**Instructions:**

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

**Section A**

**Question One (30 Marks)**

- i. Briefly describe the following terms:
  - a. Resolution
  - b. Output Primitive
  - c. Color Model (6 Marks)
- ii. Differentiate between the raster scan systems and vector scan systems. (4 Marks)
- iii. Define clipping and list three types of clipping. (4 Marks)
- iv. Describe four classifications of input devices. (4 Marks)
- v. List three 3-dimension display methods. (3 Marks)
- vi. Briefly describe two methods of visible surface detection. (4 Marks)
- vii. What is the significance of the chromaticity diagram? (3 Marks)
- viii. List four types of geometric transformations. (2 Marks)

## Section B

### Question One (20 Marks)

- i) Describe the Bresenham's algorithm for rasterizing a line. (10 Marks)
- ii) List two attributes for the Character output primitive. (1 Mark)
- iii) Prove that the multiplication of 3-dimension transformations matrices for each of the following sequence of operations is commutative:
  - a. Any two successive translations
  - b. Any two successive scaling operations
  - c. Any two successive rotations about any one of the coordinate axes. (9 Marks)

### Question Two (20 Marks)

- i) List the operating characteristics of the following display technologies:
  - a. Vector refresh system
  - b. LCDs (10 Marks)
- ii) Describe the three input modes which specify how programs and input devices interact. (3 Marks)
- iii) Verify that two successive rotations are additive. (4 Marks)
- iv) Describe any three graphics applications. (3 Marks)

### Question Three (20 Marks)

- i) Define additive and subtractive color models. Describe an example in each of the above. (10 Marks)
- ii) 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)