

UNIVERSITY OF SWAZILAND

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

MAIN EXAMINATION, MAY 2016

Title of Paper : Computer Graphics
Course Number : CS246
Time Allowed : Three (3) Hours
Instructions : Answer **ALL** questions in Section A
Answer **only THREE** questions from Section B
All questions are worth **20 marks**
Special requirement : Graph paper

This paper should not be opened until permission has been granted by the invigilator.

SECTION A

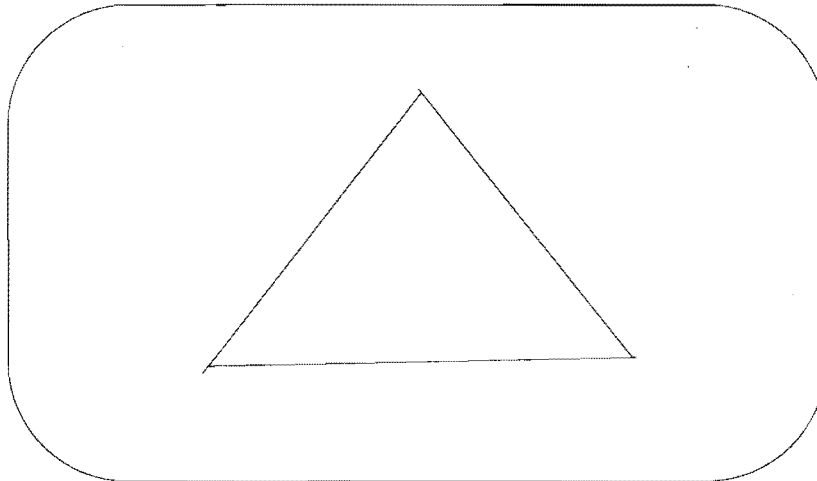
Answer all questions from this section.

Question 1.

- (a) Discuss the differences between direct manipulation, menu driven and command driven user interfaces. [8]
- (b) Draw the critical parts of an eye and describe how it functions. [7]
- (b) How do we recognize black objects in view of the fact that we can't see them since they do not reflect light signals [3]
- (c) Why should we study user interfaces alongside computer graphics? [2]

Question 2

- (a) How does a vector graphics display work? [8]
- (b) Discuss three reasons why we study computer graphics. [6]
- (c) Draw the CRT input signals to produce the following equilateral triangle [6]



SECTION B

Answer any three questions from this section.

Question 3

- (a) Vector display started off with some problems which were quickly ratified by technological improvements. However, despite these technological advancements vector graphics was disused due to two serious disadvantages, discuss these two serious disadvantages. [8]
- (b) Briefly discuss the meaning of the term raster graphics. [6]
- (c) How much memory is needed for a 640 x 480 frame-buffer with depth 3? [6]

Question 4

- (a) Why are lines so important in computer graphics? [2]
- (b) Explain the importance of the four criteria for a good line algorithm [4]
- (c) How does the recursive line drawing algorithm work? [7]
- (d) Use your description in (c) to draw the lines between:
 - i) (8, 8) to (11, 16)
 - ii) (3, 4) to (7, 8).. [7]

Question 5

Write a program to draw a car (or some vehicle) to keep moving from left to right and right to left on the screen until the user presses any key on the keyboard. [20]

Question 6

Write a program to draw a chessboard. [20]