UNIVERSITY OF SWAZILAND

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

SUPPLEMENTARY EXAMINATION, JULY 2018

Title of Paper	:	**Computer Graphics**
Course Number	:	**CSC352**
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	:	**None**

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

SECTION A

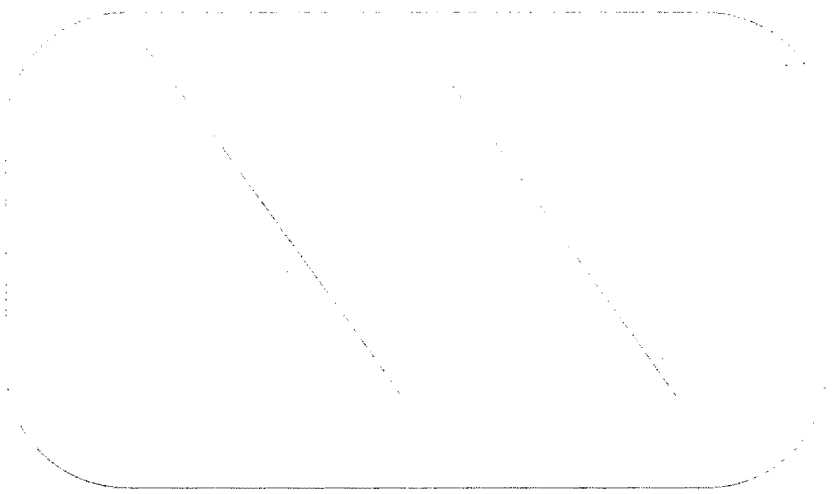
Answer all questions from this section.

Question 1.

(a)	State what API stands for, and define it.	[6]
(b)	Why don't we see the colour black yet recognize?	[3]
(c)	Why should we study user interfaces alongside computer graphics?	[3]
(d)	Describe macho language and discuss why it is not encouraged in UI.	[5]
e)	Why was vector graphics discontinued?	[3]

Question 2

(a)	How does computer graphics differ from image processing?	[5]
(b)	Why was vector graphics not of widespread usage during its era?	[6]
(c)	Draw the CRT input signals for the following output (on graph paper):	[9]



SECTION B

Answer any three questions from this section.

Question 3

(a) In what way(s) was vector graphics displays superior to printers? [4]

(b) Sizes of CRTs are normally given by the length of their diagonal (the ratio of the width and height is standardized at 2:3). With a 14" tube and a *640* x *480* frame buffer, what are the horizontal and vertical resolutions? How could an aspect ratio of 1:1 be achieved on such a screen? [10]

(c) How much memory is needed for a *520 x380* frame buffer with depth 2? [6]

Question 4

(a) Describe how a CRT works. [12]

(b) Show that the Bresenham line drawing algorithm is purely integer arithmetic i.e., there are no fractions, no divisions nor multiplications in it. [8]

Question 5

(a) Find the transformation matrix for rotation around an arbitrary point (x, y) over an arbitrary angle Φ. [6]

(b) Compute the coordinates of the image of (3, 2) after each of the following transformations:

- rotation around the point (4, 1) through an angle of 90°;
- rotation around the point (3, 2) through an angle of 30°. [6]

(c) Establish and briefly describe all the possible segment-segment relations. [8]

Question 6

(a) Write a program to draw a chessboard to fill your entire VDU (include the design of your program (pseudocode)) [20]