ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF SCIENCE, TECHNOLOGY, AGRICULTURE AND FOOD SYSTEMS DEVELOPMENT

DEPARTMENT OF INFORMATION SYSTEMS

EXAMINATION PAPER

COURSE CODE:	BIS415
COURSE TITLE:	COMPUTER GRAPHICS
SPECIAL REQUIREMENTS:	NONE
LEVEL:	**4**
EXAM DURATION:	3 hours
DATE:	APRIL 2026 17 APR 2026

INSTRUCTIONS TO CANDIDATES:

1. Answer any **four** questions
2. Number your answers accordingly
3. Start each question on a new page
4. You can use a calculator.

Question 1

a) Illustrate with a diagram the principles of operation of the following hand-held displays.

(i) Liquid crystal displays [5 marks]

(ii) Electrophoretic (electronic paper) displays [5 marks]

b) Outline FOUR the disadvantages of OLED computer screens [4 Marks]

c) Outline the merits and demerits of Plasma panel display [4marks]

Question 2

a) Consider two raster systems with resolutions of 640* 480 and 1280* 1024. Calculate the number of pixels than can be accessed per second in each of these systems by a display controller that refreshes the screen at a rate of 60 frames per second? [6 marks]

b) Illustrate with the aid of a diagram the role of the frame buffer in the raster method [6 marks]

c) To display in a computer screen the programmer needs to poke the video memory. Explain how memory mapping works, using diagrams where necessary [6 Marks]

Question 3

a) Given the endpoints **A(2,5)** and **B(18,22)** use the Digital Differential Analyser (DDA) algorithm to rasterize the points between these two endpoints, showing all your working. [12 marks]

b) Outline the problems associated with the Digital Differential Analyzer line-drawing algorithm [8 marks]

Question 4

a) Use the Cohen Sutherland algorithm to clip the two lines P1 (35,10) - P2(65,40) and P3(65,20) - P4(95,10) against a window A(50,10),B(80,10),C(80,40),D(50,40). [10 marks]

b) Use diagrams to illustrate the translation transformation of factor 3 to the triangle with the following vertices: A(-2, 5), B(5, -5) and C(9, 13) [10 marks]

Question 5

a) Given a line from **(2, 3)** to **(10, 7)** calculate the decision parameters P_0, P_1, P_2 and the next three pixels using Bresenham's line algorithm. [12 marks]

b) Outline the issues related to multiple windowing? [4marks]

c) Differentiate between raster scan and random scan display [4 marks]

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