BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE EDUCATION

DEPARTMENT OF EDUCATIONAL TECHNOLOGY

BACHELOR OF SCIENCE EDUCATION IN COMPUTER SCIENCE

CS411/EDT411: COMPUTER GRAPHICS

AUG 2024

TIME: 3 HOURS

INSTRUCTIONS

Answer **ALL the questions.** Each question carries **20** marks.
The question paper has **five** questions

Question 1

i. Define the following terms as used in the course:
   a. a Pixel [2]
   b. Frame buffer [2]

ii. Give **four** of the applications of Computer Graphics [8]

iii. Explain **any two** differences between Random Scan and Raster Scan. [4]

iv. Describe **any two** line drawing algorithms. [4]

Question 2

i. Rephrase the Bresenham's algorithm to plot 1/8 th of the circle and write the algorithm required to plot the same. [5]

ii. Write the midpoint subdivision algorithm for line clipping. [4]

iii. Draw and clearly label a shadow-mask CRT [8]

iv. Using the Sutherland Hodgman polygon Clipping algorithm show how the figure below can be clipped against a window [3]

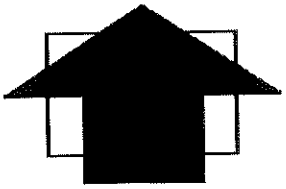

Figure 1: Original Shape before Clipping

Question 3

i. Write a program in 'C++' to generate Hilbert's curve. **[10]**

ii. Rotate a triangle about the origin with vertices at original coordinates (10,20), (10, 10), (20, 10) by 30 degrees, **[10]**

Question 4

i. Given the vertices of Bezier Polygon as $P_0(, 1)$, $P_1(2,3)$, $P_2(4,3)$,$P_3(3,1)$, determine five points on Bezier Curve. **[10]**

ii. Write a Program in 'C++' for DDA Circle drawing algorithm **[10]**

Question 5

Explain inside and outside test for polygon with the aid of diagrams using:

a. Non-zero winding number rule **[10]**

b. Odd-Even Rule **[10]**

THE END OF EXAMINATION PAPER