



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 305: COMPUTER GRAPHICS

DATE: 18/1/2021

TIME: 2:00 – 4:00 AM

INSTRUCTION: Answer Question ONE and any other TWO Question

QUESTION ONE (COMPULSORY)

- a) Explain three color schemes common in Computer Graphics (6 marks)
- b) Explain any two free and two commercial graphics software tools (8 marks)
- c) List the any four curves common in computer graphics (4 marks)
- d) State the functions of any four hardware required in computer graphics (4 marks)
- e) Draw the output of the openGl program shown below (8 marks)

```
#include<GL/glut.h>

#include<stdio.h>

void display()
{
    glClear(GL_COLOR_BUFFER_BIT);
    glColor3f(1.0,0.0,0.0);
    glPointSize(2.0);
    glBegin(GL_POINTS);
    glVertex2f(0.0,0.0);
    glVertex2f(0.0,0.5);
    glEnd();
    glBegin(GL_LINES);
    glVertex2f(0.0,0.0);
    glVertex2f(0.0,0.5);
    glEnd();
    glBegin(GL_POLYGON);
    glVertex2f(0.0,0.0);
    glVertex2f(0.0,0.5);
    glEnd();
    glFlush();
}
```

```

void myinit()
{
glClearColor(0.0,0.0,0.0,1.0);
gluOrtho2D(-1.0,1.0,-1.0,1.0);
}
void main(int argc, char **argv)
{
glutInit(&argc,argv);
glutInitDisplayMode(GLUT_RGB|GLUT_SINGLE);
glutInitWindowSize(500,500);
glutInitWindowPosition(0,0);
glutCreateWindow("Simple demo");
myinit();
glutDisplayFunc(display);
glutMainLoop();
}

```

QUESTION TWO

- a) Define fractal geometry and describe any three application areas of fractal geometry (11 marks)
- b) List five the components of graphics view pipeline (5 marks)
- c) Describe interactive computer graphics (4 marks)

QUESTION THREE

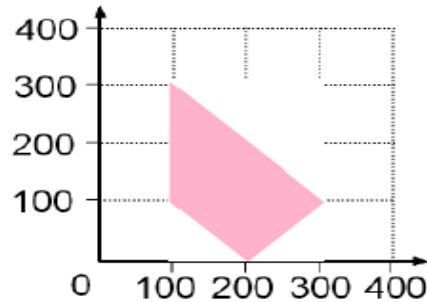
- a) Describe three various types of transformation using mathematical equations (9 marks)
- b) Describe text clipping (7 marks)
- c) Describe morphing (4 marks)

QUESTION FOUR

- a) Explain the three advanced elements for drawing in computer graphics (6 marks)
- b) Graphically produce a circle in Cartesian plan (6 marks)
- c) Write an openGl code to produce a triangular strip embedded in a rectangle (8 marks)

QUESTION FIVE

- a) Compare and contrast Bresenham algorithm and DDA algorithm (8 marks)
- b) Given the image below, produce the same image when placed in a room with some sunlight rays, reflective surfaces and then translated by 50 units in x and 100 units in y. Include the header (My Diagram) and clip it at $y \geq 150$, $y \leq 300$ and $x \geq 150$, $x \leq 320$. (8 marks)



- c) Explain the effect of light and shading on graphics appearance (4 marks)