NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
MAY EXAMINATIONS 2005

SUBJECT: COMPUTER GRAPHICS
CODE: SCS5204

INSTRUCTION TO CANDIDATES

This question paper consists of Five questions. Answer any Four questions. Each question carries 25 marks.

Time: 3 hours

QUESTION ONE

a) Compare and contrast direct storage method and the colour lookup table method for storing colour in information in the frame buffer. [10]

b) Explain briefly the following raster scan display system characteristics:
i) refresh rate [2]
ii) interlaced scanning [2]
iii) dot pitch [2]

c) The output primitive put pixel (x,y,colour) plots a point on a display screen with a specific colour. Explain how the movement along the x-axis and y-axis is achieved in plotting the pixel on:

i) Cathod Ray Tube (CRT) [5]
ii) Liquid Crystal Display (LCD) [4]

QUESTION TWO

a) Explain in detail the techniques, which can be used to solve the raster scan graphics representational problem called aliasing. [12]

b) Outline the role of Geometric Transformation in image morphing [13]

QUESTION THREE

a) Write a menu driven C++ program that allows the user to specify the clipping window and the end-points of a line and then clips the line against the specified window using the Cohen-Sutherland line-clipping algorithm. [24]

b) Mention any line algorithm you know that is more efficient than the Cohen-Sutherland line-clipping algorithm [1]

QUESTION FOUR

Write a C++ programme code that renders two circles and determines their intersection status (intersect at one point, two points, all points-superimposed, no intersection). The points of intersection should be labelled P, Q, . [16]

Outline the characteristics of the following video memory types:

i) Extended Data Output Random Access Memory (EDORAM) [3]
ii) Video Random Access Memory (VRAM) [3]
iii) Static Random Access Memory (SRAM) [3]

QUESTION FIVE

a) Give a brief description of any six (6) application areas of Computer Graphics. [12]

b) Write a program in C++ that applies specified sequence of transformations to a displayed object. The program is to be designed so that a user selects the transformation sequence and associated parameters from displayed menus, and the composite transformation is then calculated and used to transform the object. The display should consist of the original object and its image (the image should be in different colour). [13]

END OF QUESTION PAPER