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

SUBJECT: OPERATING SYSTEMS CONCEPTS
CODE: **SCS1103**

INSTRUCTION TO CANDIDATES

Answer any five questions.

Time: 3 hours

QUESTION ONE

explain the following terms
a) concurrency   [4]
b) reusable resources   [4]
c) mutual exclusion   [4]
d) circular wait   [4]
e) preemption   [4]

QUESTION TWO

a process contains 8 virtual pages on disk and is assigned a fixed allocation of 3
page frames in memory. The following page trace occurs:
      1,0,2,2,1,7,6,7,0,1,2,0,3,0,4,5,1,5

    a) show the successive pages residing in the 4 frames using LRU
       replacement policy.   [10]
    b) Repeat a) but this time use the FIFO replacement policy.   [10]
    Assume the frames are initially empty.

QUESTION THREE

a)   i)   Differentiate between demand and anticipatory fetch policies [4]
       ii)   Which is easier to implement and why?   [4]

b)   Explain the following terms:
       i.   partition   [2]
       ii.   defragment   [2]
       iii.   file structure   [2]
       iv.   format   [2]
       v.   boot   [2]
       vi.   firmware   [2]

QUESTION FOUR

a)   Explain 2 main functions an operating system performs   [10]
b)   Describe 3 operating system structures and give an example of each [10]

QUESTION FIVE

Explain the difference between the following:
       i.   antivirus and firewall   [4]
       ii.   Process and program   [4]
       iii.   Main memory and virtual memory   [4]
       iv.   Paging and segmentation   [8]

QUESTION SIX

a)   What is an iterrupt handler?   [4]
b)   what is the benefit of non-contiguous memory allocation over contiguous
       memory allocation?   [4]
c)   a virtual address a in a paging system is equivalent to a pair (p,w) in
       which p is a page number. Let z be the number of bytes in a page. Find
       algebraic equations that show p and w as functions of z and a.   [4]
d)   what is a device driver   [4]
e)   explain the concept of plug and play   [4]

END OF QUESTION PAPER