NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCE

COMPUTER SCIENCE DEPARTMENT

Examination January 2013

SUBJECT: Microprocessors and Operating Systems
CODE: SCS 5104

Instructions to candidate:

1. Answer any four questions. Paper contains five questions.
2. Each question is worth 25 MARKS **DURATION 3HRS**
3. Attached is an Instruction Set

QUESTION ONE

a) Outline the importance of **Interrupts** to the functionality of Operating Systems. [5]
b) State the three parameters used to define the data storage heiracachy. [6]
c) Using a state transition diagram illustrate the change of states of an Operating System **process.** [10]
d) Differentiate between a program and a process. [4]

QUESTION TWO

a) Using a diagram illustrate the input/output pin structure of a 16F628 Programmable Interface Controller. [5]
b) Division is successive subtraction. Using this principle develop a program in Assembly Language which performs this task using the following example.

x = a / b ; [20]

QUESTION THREE

a) Multiplication is successive addition. Write a Linux scripting program which performs this task outlining how this script can be launched from the command line terminal. [10]

b) Discuss the structure of the ARM processor including the weaknesses and strengths. [15]

QUESTION FOUR

A great deal of research has been undertaken regarding the security or the insecurity associated with various Operating Systems. You have been sent by your organisation to present a paper outlining the security of the Microsoft Windows, Linux and Android platforms. Write a paper outlining your presentation to include but not limited to vulnerabilities, threats and robustness. [25]

QUESTION FIVE

a) **"16F628 Alive"**. Using this expression as sample data develop assembly language code that is able to transfer the data to a personal computer through an RS232 interface. [15]

b) Using diagrams outline how a 16F628 programmable interface controller is connected to a serial personal computer port. [10]