FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.
SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY
DEPARTMENT OF INFORMATION & MEDIA TECHNOLOGY
SECOND SEMESTER EXAMINATION, 2013/2014 ACADEMIC SESSION

Course Code: *IMT 321* **Course Title**: *System Programming*
Credit Unit: *3* **Time**: *2 Hours*.

Instruction: Answer ONLY four (4) questions with at least ONE question from each of the three sections.

SECTION A

Question 1

a. Draw a well label diagram of UNIX architecture.

b. Explain the concept of UNIX file system.

c. Write short notes on special and network-oriented file systems.

d. List six flavours of UNIX.

Question 2

a. Explain the two major factors that contributed to wide acceptance of UNIX in the 1970s.

b. (i) Describe the tools that enable UNIX users to interact with the operating system.

(ii) Which of these tools will you recommend for basic users and system administrators to effectively perform their duties on UNIX system?

(iii) Why will you choose the recommend tool for each group of UNIX users mentioned in b(ii)?

c. As a UNIX System Administrator, why do you think Bourne shell scripting should be preferred over C programming language?

SECTION B

Question 3

a. List 3 commands you can use to identify the users currently logged on to the UNIX system.

b. Outline any three file access modes for a file on the UNIX file system.

c. Use the Symbolic method to change the file permissions on the file "Victor.txt" such that Owner will have all permissions, Group will have only read and execute permission while others will have only execute permission. Present working directory is "/" and "Victor.txt" is located in "/home/IMT321" directory. (Show all necessary steps and Commands).

Question 4

a. Differentiate between Relative and Absolute filenames.

b. What will the following commands do?

i. **cat** cit321.txt
ii. **cd** /home/cit321/

cp lesson1 lesson2

iii. **rm** *.txt

iv. **ls** cit321/lectures

v. **passwd**

c. What is the relevance of the MAN command to the UNIX environment?

d. What information do the environmental variables $PATH and $HOME hold for the UNIX environment?

SECTION C

Question 5

a. Explain how to declare the following program constructs in Bourne shell script using appropriate syntaxes.

(i) looping with ***for*** statement (ii) ***function*** declaration

b. Explain the meaning of the following file input/output operators in UNIX:

(i) >&- (ii) <&- (iii) | (v) n <& m

c. Write a Bourne shell script that will *compute* the average of three numbers passed to it from command line and *append* the result to the content of a text file called ***imt321.txt*** which is within the same directory with your script. Your script is expected to *declare*, *implement* and *invoke* a function named ***MeanCalculator*** for the computation.

Question 6

a. (i) Why do you think multinational companies prefer UNIX operating system for their enterprise server?

(ii) Describe the use of ***unset*** and ***export*** keywords in Bourne shell scripting.

b. Explain the tools for compiling C program in UNIX.

c. Identify the errors in the code below by stating the line numbers where the errors occurred and the nature of the errors.

```
1.  #/bin/sh
2.  C=1
3.  while test $C > 30 ; do
4.  if [$C = 5 -o $C = 20 -o $C = 25 ];
5.  C=` expr $C + 2 `
6.  continue
7.  echo when I will i ever be printed?
8.  fi;
9.  echo $C
10. C=`expr $C + 2`
```

Best of Luck!