FEDERAL UNIVERSITY OF TECHNOLOGY MINNA
SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY
DEPARTMENT OF INFORMATION AND MEDIA TECHNOLOGY
2011/2012 ACADEMIC SESSION
IMT 321 (SYSTEM PROGRAMMING) FINAL EXAMINATION
Instruction: Attempt **Question 1 (ONE)** and any other **THREE** Questions.

Time Allowed: 2 hours

Candidate Name: ....

Matriculatio Number: ....

1. Indicate whether each of the following statements is true, false or cannot say:

    a) "Better is worse" is a unix philosophy.

    b) A unix system administrator need not bother about system security.

    c) Free and Open Source Software (FOSS) is based on commercial interests.

    d) Command Line Interface (CLI) is a strength and weakness of the unix operating system.

    e) The command **du** is an example of a command suitable for unix system administration.

    f) Open Source Softwares (OSS) attract a large number of developers to market it.

    g) Unix is a highly unstable operating system because of the flexibility it offers.

    h) A way to ensure security in a unix system is to give room for cascading privileges

    i) Security is the goal of unix operating system.

    j) Tool chest in unix means that unix has many tools with each specializing in doing one thing well.

2. a) What is responsible for many flavours of unix available today? Mention TWO examples of unix flavours.

    b) What is a NULL command?

    c) Declare an array of fruits and initialize the array with three fruits. Write statements to return:

        I) All the elements of the fruit array.

        II) The second element of the fruit array.

        III) The length of the fruit array.

3. a) Describe the components of a unix operating system.

    b) Classify variables and give an example of each category.

3.　c) Interpret the following shell commands:

      I)　**cd && ls**

      II)　**cd || ls**

      III)　**cd;ls**

      IV)　**{ cd /bin; ls -a | wc -l; }**

      V)　**(cd /bin; ls -a | wc -l)**

4.　a) Explain the file system organization in unix. Give TWO examples of directories in unix and their purpose.

    b) Copy and complete the table below with the following words:

      variable substitution　　　**command substitution**　　　**script name**

      length of a string　　　**evaluates arithmetic expression**

S/N	Symbol	Purpose
1	$v1	
2	$0	
3	$(...)	
4	${#...}	
5	$((...))	

    c) Differentiate between programs and processes.

5.　a) Why the need for file security in unix? Explain the mechanism for file security in unix.

    b) Consider the following shell script and give the output of the script.

```
#!/bin/bash
test_str="Hello, IMT FUTMX"
echo ${test_str:0}
echo ${#test_str}
echo ${test_str:0:5}
echo ${test_str:0:${#test_str}-6}
echo $test_str
```

    c) How are shell commands executed in unix?

6. a) The Federal University of Technology Minna is organized academically into Schools. Schools administer Departments and Departments offer courses. The Department of Information and Media Technology is a department in the School of Information and Media Technology. The Department offers System Programming (IMT 321) among other courses. Suppose the University has a computer running unix, propose a file system organization that allows for efficient management of information on each course such as lecture notes, assignments, projects, and evaluation for the University. **[Hint: Use appropriate unix commands in your answer]**

b) Explain the statement "Security of a system varies inversely with user convenience".

c) Differentiate between redirection and pipe.

******************************* **End of Paper**********************************
Good Luck!!!