

**CHUKA UNIVERSITY**  
**FORTH YEAR SECOND SEMESTER EXAMINATIONS FOR BACHELOR OF APPLIED**  
**COMPUTER SCIENCE**

**ACMP 428: UNIX SYSTEMS ADMINISTRATION AND PROGRAMMING (LINUX)**

**CANDIDATE INSTRUCTIONS**

1. Answer **all questions** in section A and any other **two questions** from section B.
2. No Reference Material is allowed in the exam Room.
3. Write legibly on Both sides of question paper.
4. All Mobile phones should be switched off in the exam room.

**SECTION A (COMPULSORY)**

**QUESTION 1 (COMPULSORY) [30 MARKS]**

- a) Using an example, explain the use of the following command on files.  
\$ sort record.txt | uniq (4marks)
- b) Write a shell script using FUNCTIONS that prompt a user to enter his first name, and two numbers. it then prints the name and the sum of two numbers (6marks)
- c) Differentiate between *echo* and *echo {0,1}{0,1}{0,1}* when keyed on the command prompt. (4marks)
- d) Explain what the following commands does in Linux.
  - i) df (2marks)
  - ii) uname (2marks)
  - iii) gzip (2marks)
- e) Explain FIVE shell build in variables. (5marks)
- f) Write a shell script called *leaptest* that prompts a user to enter the year in 4 digits and test if the year is leap or not (*a leap year is divisible by 4*) (5marks)

**SECTION B (Answer two question from this section)**

**QUESTION 2 [20 MARKS]**

- a) Write a shell script that prints the following output (8marks)  
0  
1 0  
2 1 0  
3 2 1 0  
4 3 2 1 0
- b) Explain the usage of the following Linux commands in TCP/IP management

- i) route -n (2marks)
  - ii) netstart -t (2marks)
  - iii) ifconfig -a (2marks)
- c) Explain what happens when each of the following codes are keyed in a bash console. Hence write the output.
- i) declare -i number  
number=2+4\*10  
echo \$number (2marks)
  - ii) another=2+4\*10  
echo \$another (2marks)
  - iii) number="foobar"  
echo \$number (2marks)

### QUESTION 3 [20 MARKS]

- a) Outline TWO ways on how to set permissions of a file such that the user has all the privileges, while group and others have only read and execute privileges. (6marks)
- b) Using pipes, display all lines of files list1 and list2 that contains letter 'p', and sort the results (3marks)
- c) Explain the following Linux installation methods (6marks)
  - i) CD/ DVD installation
  - ii) Network installation
  - iii) Kick-start installation
- d) Outline the function of the following directories in Linux operating system (5marks)
  - i) /usr/bin
  - ii) /boot
  - iii) /dev
  - iv) /etc
  - v) /media

### QUESTION 4 [20 MARKS]

- a) Write a shell script that will prompt a user to enter a number, then it returns the factorial of the number. (7marks)
- b) Using an example, Explain the following redirection commands

- i) P>&m (2marks)
  - ii) P>>somefile (2marks)
  - iii) find . -name 'my\*' 2>error.log (3marks)
- c) Explain SIX special variables that can be used in shell scripting. (6marks)

**QUESTION 5 [20 MARKS]**

- a) Tar command can be used with several options in Linux. Explain FIVE options that can be used with the tar command. (5marks)
- b) Write a shell script that prompts a user to enter four numbers. It then finds the sum, the average and the product of the four integers entered. (7marks)
- c) Write a shell script using if...fi statement, and test command to test for the following: - (8marks)
  - If a file is not empty,
  - If it's a file and a not directory,
  - If a file exists,
  - If it's a directory and not a file,
  - If a file is read only,
  - If file is executable