

CHUKA



UNIVERSITY

## UNIVERSITY EXAMINATIONS

**FOURTH YEAR EXAMINATION FOR THE AWARD OF DEGREE OF  
BACHELOR OF SCIENCE IN APPLIED COMPUTER SCIENCE**

**ACSC 429: UNIX SYSTEMS ADMINISTRATION AND PROGRAMMING (LINUX)**

**STREAMS: BSC (ACSC)**

**STREAMS: 2 HOURS**

**DAY/DATE: TUESDAY 07/04/2020**

**8.30 AM – 10.30 AM**

**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. All Mobile phones should be switched off in the exam room.
4. Write legibly.

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

- a) Assume a certain text.txt file contain the following text “*this boy is the cruel one who hit a dog*”. Explain what the following awk command will perform to text.txt, and hence print the output. (4marks)
 

```
awk '{ print $2, $1 }' text.txt
```
- b) Explain what each of the following control characters perform in Unix, CTRL-U, CTRL-S, CTRL-Q, and CTRL-D (4marks)
- c) Explain FOUR hidden files in UNIX, clearly indicating what each file does. (4marks)
- d) Write Linux commands that one would use to perform the following operations: -
  - i) Remove all the files beginning with letter **h** and ending with letter **c**
  - ii) Display print queue status of a printer called **admin4** (4marks)
- e) Below is a table showing the features of a shell. Fill the functions of each feature and state whether that feature is available or not in the csh (c shell) and ksh (korn shell) columns respectively. (6marks)

f) Feature	Function	Csh (Yes/No)	Ksh (Yes/No)
Job control			
History substitution			
Command line editing			
Command aliasing			

diagram, explain the basic architecture of unix.

(4marks)

g) Explain what the following UNIX pipelines do

(4marks)

- i) `du | sort -nr`
- ii) `find . -type f -print | wc -l`

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

#### QUESTION 2 [20 MARKS]

- a) 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. (7 marks)
- b) Outline the steps of changing a shell from Bourne shell to C shell in UNIX. (3marks)
- c) When you type `ls -l` the system returns lines of statements with 7 columns each. Using an example, explain the contents of each column in their respective order. (4marks)
- d) Explain the process of performing the following in unix
  - i) Starting a background process (2marks)
  - ii) Showing running processes without terminals (2marks)
  - iii) Stopping a process (2marks)

#### QUESTION 3 [20 MARKS]

- a) Filters are very important in UNIX programming. Using an example and a solution the filter will provide, explain what the following filters perform. (4marks)
  - i) `grep`
  - ii) `fmt`
- b) 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)
- c) Explain the steps one would use to create a file called peter and type the following text in it. "*This is my first program. I like Unix*" (5marks)
- d) Using a Unix command extract in each case, explain THREE change mode operators (6marks)

**QUESTION 4 [20 MARKS]**

- a) Write a shell script that will prompt a user to enter a number, it then prints all the numbers divisible by that number from 20 to 1000. (8marks)
- b) Explain the following Linux installation methods (4marks)
- i) CD/ DVD installation
  - ii) Network installation
- c) Differentiate between *echo* and *echo {0,1}{0,1}{0,1}* when keyed on the command prompt. (4marks)
- d) Explain the meaning of the following string comparisons
- i) -n s1 (2marks)
  - ii) -z s1 (2marks)

**QUESTION 5 [20 MARKS]**

- a) Explain the usage of FIVE environment variables in UNIX. (5marks)
- b) Write the output of the following UNIX shell script (4marks)

```
#!/bin/sh

a=0
while [ "$a" -lt 8 ]
do
  b="$a"
  while [ "$b" -ge 0 ]
  do
    echo -n "$b "
    b='expr $b - 1'
  done
  echo
  a='expr $a + 1'
done
```

- c) With reference to shell scripting: -
- i) Write a shell script that prompts a user to enter two integers, then it returns their sum and product, only if the second integer is greater than the first integer. If the second integer is lesser than the first integer, it prompts the user to enter a first integer which is greater than the second, and the system exits. (7marks)
  - ii) Outline how to set permissions of the above script such that the user has all the privileges, while group and others have only read and execute privileges. (2marks)
  - iii) Draw the flow chart of the shell script in (i) above (2marks)