



(Knowledge for Development)

KIBABII UNIVERSITY
UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR
END OF SEMESTER EXAMINATIONS
YEAR FOUR SEMESTER ONE EXAMINATIONS
FOR THE DEGREE OF
BACHELOR OF COMPUTER SCIENCE

COURSE CODE : CSC 413

COURSE TITLE : UNIX PROGRAMMING

DATE: 28/04/2023

TIME: 9:00 A.M – 11:00 A.M.

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

Question 1 (30 Marks) Compulsory

- a) Describe Tee Commands [4 Marks]
- b) What is a process? [1 Mark]
- c) Show how you capture standard error and direct it to a file. [2 Mark]
- d) State whether the following sentence is true or false: [4 Marks]
- Linux is a collection of programs and utilities glued together by the bash shell.
 - Shell manages files and data.
 - Shell manages networks, memory and other resources.
 - Bash Shell is also known as /bin/bash or /usr/local/bin/bash.
 - Linux file system is organized as hierarchy.
 - Everything is file in Linux.
 - Linux can run many programs at the same time.
 - The bash shell is just a program.
- e) Explain the difference between the gzip and tar commands [2 marks]
- f) Write a command to list details of all files ending in '.perl'. [1 mark]
- g) What is the difference between a multiuser and a multitasking system? [2 marks]
- h) The following message is displayed when you attempt to log in with an incorrect username or an incorrect password:

Login incorrect

This message does not indicate whether your username, your password, or both are invalid. Why does it not tell you this information? [2 marks]

- i) What happens when you give the following commands if the file named done already exist? [2 marks]

```
$ cp to _do done
```

```
$ mv to _do done
```

- j)
- Write the command to find the phone number for **Ace Electronics** in a file named **phone** that contains a list of names and phone numbers? [3 marks]
 - Which command can you use to display the entire file in alphabetical order? [2 marks]
 - How can you display the file without any adjacent duplicate lines? [2 marks]
 - How can you display the file without any duplicate lines? [2 marks]
- k) Write a command to make a backup of existing variable called PS1 to OLDPS1. [1 mark]

Section B: Answer any TWO questions

Question 2 (20 marks)

- a) You are logged on as a standard user, explain how you change your role to a root user. [2 marks]
- b) What is the command you give to shut down the system in 10 minutes? [2 marks]
- c) Explain how you can use the shell to [3 marks]
- i. add a user called Wambui with password Anyango1988 [2 marks]
 - ii. create a user group scs215 [2 marks]
 - iii. find out which group a user belongs
- d) [2 marks]
- i. What is a daemon? [2 marks]
 - ii. What does the crond daemon do? [2 marks]
 - iii. It is important that daemons related to mission critical services are immediately re-spawned if they fail for some reason. With the help of an example explain how you can achieve this. [5 marks]

Question 3 (20 marks)

- a) What is the shell? [1 mark]
- b) Write a shell script that allows a user to enter directory name. The program should then create directory name in /tmp directory. [4 marks]
- c) Suppose that the command "ls -l test" produces the line: [5 marks]

-rw-r-x--x 2 carver faculty 1732 Jan 23 20:39 test:

- i. Who is the file's owner and what are his/her access permissions?
 - ii. What is the group associated with the file and what are its access permissions?
 - iii. What users have permission to read test?
 - iv. What size is the file?
 - v. What does the Jan 23 20:39 mean?
- d) List the files in the following listing that would be deleted by the command:

`rm ?{ab,cd,ef}*-[2-4].dat?`

(note that the ?'s are part of the command filename pattern)

[5 marks]

abcdeh-3.data

ibcde-2.dat1

nbefg-3.dat2

dab-2.data

icd2-5-3.data

pabcdf3-4.data

eabc-2.data	icd2ef1.data	pef3.data1
eefg-3.data	jcd2ef-3.dat	pefcd-34.data
iabh7-4.data	jcd2ef-3.data	pefcd-3.data
iabh32.dat	jcef21-23.dat	pefcd-3.save

- e) Write a one line C code, which must make a UNIX system call to open a file for appending and must create it if it doesn't exist, with read & write permission for the owner and only read permission for everyone else. **[5 marks]**

Question 4 (20 marks)

- a) For each of the following state whether it is an absolute pathname, a relative pathname, or a simple filename? **[5 marks]**
- milk_co
 - correspond/business/milk_co
 - /home/max
 - /home/max/literature/promo
 - ..
 - letter.0210
- b) If the working directory is /home/max with a subdirectory named literature, give three sets of commands you can use to create a subdirectory named **classics** under **literature**. Also give sets of commands you can use to remove the **classics** directory and its contents. **[6 marks]**
- c) Assume the following files are in the working directory:

\$ ls

```
intro      notesb      ref2      section1    section3    section4b    notesa
  ref1 ref3      section2    section4a    sentrev
```

Give commands for each of the following, using wildcards to express filenames with as few characters as possible. **[6 marks]**

- List all files that begin with **section**.
 - List the **section1**, **section2**, and **section3** files only.
 - List the **intro** file only.
 - List the **section1**, **section3**, **ref1**, and **ref3** files.
- d) What does the following command do? **[2 marks]**

\$ sleep 30 | cat /etc/services

If you don't want to wait for the command to finish, how can you make the program to execute in the background? **[1 mark]**

Question 5 (20 marks)

a) An operating system is a resource manager. It takes the form of a set of software routines that allow users and application programs to access system resources (e.g. the CPU, memory, disks, modems, printers network cards etc.) in a **safe, efficient** and **abstract** way. Using examples explain the words in bold as used in the context of Unix operating system.

[6 Marks]

b) Compare and contrast the Unix and the Linux operating systems.

[4 Marks]

c) Outline briefly, with the help of a diagram, the architecture of Linux operating system.

[10 Marks]