

# FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY DEPARTMENT OF INFORMATION AND MEDIA TECHNOLOGY

#### SECOND SEMESTER 2016/2017 EXAMINATION

COURSE CODE: IMT 321

COURSE TITLE: System Programming

CREDIT UNITS: 3

TIME ALLOWED: 3 Hours

COURSE LECTURER(S): Dr. H. O. Aliyu

NUMBER OF QUESTIONS: 4

NUMBER OF PAGES: 4

#### INSTRUCTIONS

- · Answer all questions
- Do not use red pen
- · Please use a clear handwriting
- This exam is closed book, closed notes, closed laptop and closed cell phone
- Do not use calculators



```
-rwxrw-r-x 1 akpan imt 4096 2017-07-26 20:30 assigment
drwxr-xr-x 2 daniel sict 409600 2017-05-07 17:21 Videos
lrwxrwxrwx 1 ahot sict 409600 2017-10-23 08:00 result -> home/ahotexams/imt321
crwxrw-r-x 1 akpan imt 4096 2017-07-26 20:30 sdb1
```

#### Figure 1

```
Courselist
|
|-IMT321
|-CIT323
|-IMT322
|-CPT300
|-GST311
|-CPT350
|-IMT336
|-CPT301
|-CIT300
```

Figure 2

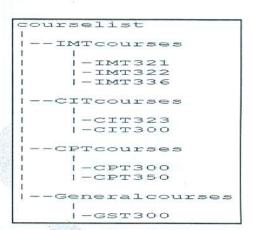


Figure 3

```
#!/bin/bash
    do_backup () { ### study function do_backup carefully to identify what it does
 3
          counter=0
4
          for file in $(ls $1); do
 5
              fname=Sfile.bak
 6
              $(cp $1/$file $2/$fname)
7
              echo "$1/$file copied"
8
              counter=$ ( (Scounter+1) )
9
          done
          echo "Scounter files copied"
10
11
                                            "You
12
      if [ S# -ne 2 ]; then
         echo "Exactly two operands required"
15
          echo "command's syntax in imtbk source dir dest_dir"
16
17
      fí
18
19
     if [ -d $1 ]; then
20
          if [ -d $2 ]: then
21
              echo "S2: destination directory found"
22
              do_backup $1 $2
23
          else
24
             $ (mkdir $2)
25
              echo "$2: backup directory created?"
26
              do backup SI $2
27
          fi
28
          exit 0
29
30
         echo "$1: No such directory"
31
          exit 1
```

Figure 4



### Question 1:

a.

i. Name the four essential components of Disk Operating System (DOS)	(4 marks)
The second secon	

ii. State three differences between file naming conventions in DOS and UNIX (3 marks)

iii. State three differences between DOS and UNIX commands (3 marks)

b.

i. What are wildcards? (2 marks)

ii. Explain any three wildcards you know, giving at least one example in each case (3 marks)

## **Question 2:**

a. With the aid of a suitable diagram, briefly describe the UNIX architecture (3 marks)

b. Figure 1 shows the result of executing the Linux command 1s -1 in a directory

i. Briefly describe each of the listed files.

(7 marks)

ii. What will be the result of executing 1s -1 in the same directory after executing the commands chmod 751 assignment

rm ahot

mkdir imtexams

chmod u=rx,o-rwx Videos

[Take the following assumptions: current user is **imt**, and is in group **sict**; a directory has two (2) links and size 4096 KB upon creation; current system date is 2017-10-23 08:30 ] (5 marks)

## Question 3:

- a. Given that Figure 2 is a segment of a Linux file system tree. How would you turn the structure of the tree to the one shown in Figure 3 (4 marks)
- b. Describe each of the following terminals in the Linux shell (4 marks)

i. ahot@imt:~\$

ii. ahot@imt:/\$

iii. ahot@imt:~#

iv. ahot@imt:/#

- c. Considering that you are in the directory IMTCourses in Figure 3:
  - i. What would be the outputs of issuing the commands 1s ./ and 1s ../ (2 marks)
  - ii. Describe, with a suitable diagram and comments highlighting the effect(s) of each command, the new structure of the tree after issuing the following commands in the order specified:

mv TMT321 ../CITCourses/

mv \* ../

cd ..

rm -r IMTCourses

(5 marks)



# **Question 4:**

Assuming your Linux distribution comes with Bourn Again Shell (i.e., bash);

a.

- i. Carefully study the shell script in Figure 4 and describe, concisely, what it does (3 marks)
- ii. Given that the name of the script is "imtbk", briefly explain (including the use of a file tree) the effect(s) of executing it from the directory courselist shown in Figure 2 as follows: imtbkp ./ imt321.exam(3 marks)
- b. Write a simple shell script that takes a non-empty directory as a parameter and merges the contents of its sub-directories into itself (the parent directory) while deleting the initial subdirectories. For example, when it takes the directory "courselist" in Figure 3 as parameter, it should turn the file tree structure to the one in Figure 2.

Add sufficient comments to make your script comprehensible.

(9 marks)