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# MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL

**VI SEMESTER B.TECH. (OPEN ELECTIVE)**

**END SEMESTER EXAMINATIONS, MAY 2017**

SUBJECT: INTRODUCTION TO LINUX AND SHELL SCRIPTING

[MCA 3281]

**REVISED CREDIT SYSTEM**

**(03/05/2017)**

Time: 3 Hours MAX. MARKS: 50

**Instructions to Candidates:**

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A. Illustrate and explain the Linux file system. Differentiate between absolute and relative path addressing. 5

1B. Describe the working of for, while and until looping structures in Linux. 3

1C. Provide the regular expressions for the following? 2

a. Match the word Linux or linux in a string

b. Match the occurrences of "Hello", "HelloC", "HelloCC", "HelloCCC"

c. Match the occurrences of BE, BE1, BEA, BEx

d. Match any character except "^"

2A. Explain the Linux kernel and its primary functions. 5

2B. I) Write the command to perform the following using either at or cron table: 3

a. Run a script file called "backup2" at 10.45 am

b. Run a command that should execute every day at 10.45 am

II) Differentiate between nice and renice commands

2C. In brief, explain the following environment variables: PATH, HOME, SHELL, PS1 2

3A. Write a shell script to create a menu of commands: 5

1. Current working directory
2. List of files in current directory (without hidden files)
3. List of files in current directory (with hidden files)
4. Exit

Implement the menu options using respective functions. Option 4 should exit the script.

3B. Write a shell script to display the multiplication table (upto 10) of a given number provided as a command line argument. Implement this with a user-defined function called multiplication-table. 3

3C. Using shell commands only, answer the following (no scripts required): 2

i. Decompress a file named xyz.bz2.
ii. View last 14 lines of a file.
iii. Count the number of words in a file.
iv. Fire a process (say process2) in the background.

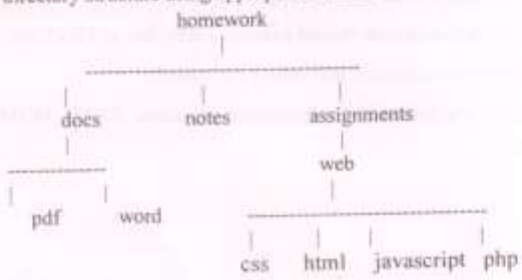
4A. Given the fields of a file called Trans.dat: Transaction number, Customer name, Customer code, Product code of product sold to customer, No. of units sold, Rate per unit, perform the operations using command specified (Field separator is space). 5

i) Display fields transaction number, customer code and rate per unit (cut)
ii) Display first five fields from file trans.dat (cut)
iii) Display customer code for employee whose name is Rayner (grep)
iv) Sort and display the transaction file in order of transaction number followed by customer code (sort).

Sort the transaction file in order of customer name and store in a file called "Customer.dat". Use sort options only.

4B. Explain command substitution in Linux with the help of appropriate examples. 3

4C. Create the following directory structure using appropriate Linux commands: 2



5A. Given the following data in a file "Players.dat", print the names and payments of those players who have scored at least six goals and played more than four matches. 5

| Jersey No. | Name | Matches played | Goals scored | Payment Received ($) |
|---|---|---|---|---|
| 03 | John Smith | 13 | 08 | 1200 |
| 05 | Harold Saxon | 09 | 04 | 850 |
| 07 | Karim Jabbar | 15 | 10 | 1400 |
| 10 | Jack Harness | 06 | 08 | 1250 |
| 12 | Martin Jones | 14 | 02 | 450 |
| 13 | Samuel Parker | 12 | 11 | 1750 |

Write the awk script file to do this.

Note: The post-processing results must display total number of records and total goals scored. Use all three parts of the awk program. File delimiter is ":".

5B. Choose the correct option for the following: 3

i. When you place several sed instructions in a file called instruction-file, you may issue the following command to tell sed to apply these instructions to file testfile:

a. sed -f instruction-file testfile
b. sed -v instruction-file testfile
c. sed -r instruction-file testfile
d. sed -n instruction-file testfile

ii. What is the output on your screen of this command line:

```
echo hi | sed -n -e 's/HI/HO/p'
```

a. no output on screen
b. Hl
c. Ho
d. Hi

iii. The sed command has the syntax format:

sed 'Address1, Address2 Instruction Flag' Filename(s)

If both Address1 and Address2 are omitted from the sed command, then

a. only the last line of the file will be examined for editing.
b. only the first line of the file will be examined for editing.
c. only the first 10 lines of the file will be examined for editing.
d. all lines of the file will be examined for editing.

iv. What is the output on your screen of this command line:

echo hi | sed -e 's/HI/HO/'

a. ho

b. hi

c. HO

d. no output on screen

v. Which sed command behaves identically to this: grep -v '.' file

a. sed -e '/./ d' file

b. sed -e '/^$/ d' file

c. sed -e 's/.//g' file

d. sed -e '/-v ./ p' file

vi. Which sed command deletes only lines that contain at least one non-digit?

a. s/^[!0-9]*$//

b. s/[0-9]/!d

c. s/[^0-9]/d

d. s/![0-9]\+//g

5C. Discuss the significance of the chfn command with reference to the /etc/passwd file. 2
Give an example.

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