A8-R3: BASICS OF OS, UNIX AND SHELL PROGRAMMING

NOTE:

1. There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.

2. **PART ONE** is to be answered in the **TEAR-OFF ANSWER SHEET** only, attached to the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book.

3. Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the answer sheet for **PART ONE** is returned. However, candidates, who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the answer sheet for **PART ONE**.

TOTAL TIME: 3 HOURS **TOTAL MARKS: 100**
(PART ONE – 40; PART TWO – 60)

PART ONE
(Answer all the questions)

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "tear-off" answer sheet attached to the question paper, following instructions therein. **(1 x 10)**

1.1 When you look for a pattern in files ignoring case which one will you use?
A) grep -v
B) grep -i
C) grep -l
D) grep -e

1.2 Which command has the same result as head -3?
A) tail +3
B) sed '3d'
C) sed '3p'
D) sed '3q'

1.3 Which special parameter indicates the name of the script?
A) $0
B) $1
C) $!
D) $*

1.4 What can be put into the first line of your script to make sure a script will use the Bourne shell?
A) #!/bin/csh
B) #/bin/sh
C) #!/bin/sh
D) $/bin/sh

1.5 Which of the following commands can be used to change the scheduling priority of a running process?
A) kill
B) ps
C) renice
D) SIGHUP

1.6   Given the command ls | tee dir, where will the directory listing be sent?
A)   To standard output and to standard error
B)   To standard output and to a file called tee
C)   To standard output and to a file called dir
D)   To a file called tee and to a file called dir

1.7   Which of the following Meta Character matches zero or more occurrences of the character immediately preceding it
A)   /
B)   ^
C) $
D)   *

1.8   Which of the UNIX command gives you complete online access to the UNIX manuals?
A)   man
B)   cat
C)   help
D)   grep

1.9   "init" run-level for system shutdown is:
A)   3
B)   2
C)   1
D)   0

1.10   Which one of the following is used to replace a single character in "vi"?
A)   O
B)   x
C)   r
D)   N

2. **Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "tear-off" sheet attached to the question paper, following instructions therein.** **(1 x 10)**

2.1   The nice command can be used to start programs with lower scheduling priority.
2.2   UNIX filenames are case sensitive.
2.3   Directories and subdirectories are hierarchical in nature.
2.4   The UNIX command to list the files in a directory is 'lst'.
2.5   The du command is used to list the detailed usage of each file/ or directory.
2.6   The logical raw device name is used by the fsck command.
2.7   Sed cannot overwrite source file.
2.8   UNIX does not treat the keyboard and the terminal as files.
2.9   i-node is a unix command.
2.10   forkp ( ) is used to create a process in Unix.

3. **Match words and phrases in column X with the closest related meaning/ word(s)/phrase(s) in column Y. Enter your selection in the "tear-off" answer sheet attached to the question paper, following instructions therein.** **(1 x 10)**

X		Y	
3.1	To set single user mode	**A.**	grep
3.2	Reboot	**B.**	init 6
3.3	Stop a process from running	**C.**	ln
3.4	Make links between files	**D.**	kill
3.5	Print all usernames currently logged in	**E.**	who
3.6	Translate, squeeze, and/or delete characters	**F.**	tail
3.7	Output the last part of files	**G.**	tr
3.8	Process status	**H.**	passwd
3.9	Set the priority of a command or job	**I.**	nice
3.10	Modify a user password	**J.**	ps
		K.	mount
		L.	init 1
		M.	login

4. **Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the "tear-off" answer sheet attached to the question paper, following instructions therein.** (1 x 10)

A.	who	B.	ping	C.	startx
D.	init s	E.	shell	F.	awk
G.	passwd	H.	getty	I.	symbolic link
J.	UMASK	K.	telnet	L.	external command

4.1   _____ is the most graceful way to get to run level single user mode.

4.2   The _____ is a command programming language that provides an interface to the UNIX operating system.

4.3   A list of currently logged in users of the Unix system is displayed by the _____ command.

4.4   The _____ command sends an echo request to a host to find out whether it can be found.

4.5   The _____ command is used to change password of a user.

4.6   To start X server manually, _____ command is needed.

4.7   _____ can also be single-line programs.

4.8   All the files and directories the user creates will have the permissions defined in _____.

4.9   The _____ utility is used for logging in to remote machine.

4.10   The command/ or files having independent existence in the /bin or /usr/bin are branded as _____.

5.
a)   What are three main elements of Unix Operating System? Explain each in brief.
b)   What Window Managers are available on the X Windows-capable Unix machine? Explain any one in brief.
c)   How do you change File Access Permissions in Unix?
d)   What is NFS? What is its job?

(6+4+3+2)

6.
a)   What is the **sed** command? Describe the format of the **sed** command giving an example.
b)   Write a script to read in a number n as an argument and calculate its factorial n! where n! = n x (n - 1) x (n - 2) x .... x 1.
c)   Write a simple shell script to show who has logged in recently.
d)   What are links and symbolic links in UNIX file system?

(4+4+4+3)

7.
a)   What are the roles of System Administrator?
b)   Lists the UNIX commands required for the root-privilege to do the following tasks:
        i)   Change group ownership of a file (or directory).
        ii)   Display the availability of space in each of the file systems in KB.
        iii)   Assign the password to a user account.
        iv)   List all processes currently running on the system.
        v)   A graphical interface system designed to provide complete device and network independence.
c)   What is a Unix Process? Mention the names of system calls that create and manipulates the process. Predict and explain the output of the following program code:

```
main()
{
    fork();
    printf("Hello World!");
}
```

(5+5+5)

8.
a)   What is the description of following *awk* built in variables? Write a simple awk program, which prints the number of occurrences of each word in its input.
b)   What is Linux File System Structure? Write the most common directories and their intended contents.

([3+4]+8)

9.
a)   What do you understand with the *tar* command? Write *tar* command to the following statement assuming the device name of drive is /dev/st0
        i)   **backup** the entire system to tape
        ii)   **only backup** the /bin directory to tape **and compress**
        iii)   **view** the contents of a tape
        iv)   **restore** the entire contents of the tape
        v)   **only restore** the file '/etc/sendmail.cf' from tape
b)   How to manually clean the file system?
c)   How are devices represented in UNIX?

([3+5]+3+4)