A8-R4: 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 **OMR ANSWER SHEET** only, supplied with 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 "OMR" answer sheet supplied with the question paper, following instructions therein.   (1x10)

1.1   The nature of open source software
A)   Software and source code available to all
B)   The freedom to distribute software and source code
C)   The ability to modify and create derived works
D)   All of the above

1.2   Runlevel 6 is reserved for
A)   Shutdown
B)   Very basic commands
C)   Reboot
D)   Starting most of the machines services

1.3   What is the use of nice() command?
A)   To execute a new program in a process
B)   To bias the existing priority of a process
C)   To get parent process identifier.
D)   None of the above

1.4   Which of the following is not a network diagnostic tool?
A)   Netstat
B)   Trap
C)   TCP dump
D)   Ping

1.5   What command do you use to create Linux file systems?
A)   mkfs
B)   fdisk
C)   fsck
D)   mount

1.6   What command is used to display the characteristics of a process?
A)   au
B)   ps
C)   du
D)   pid

1.7   The command ln-s creates a
A)   Hard link
B)   Soft link
C)   Symbolic link
D)   None of the above

1.8   What does the command tar –c do?
A)   Creates a new archive
B)   Views the contents of an archive
C)   Extracts the contents of an archive
D)   None of the above

1.9   What command is used with vi editor to save file and remain in the editing mode?
A)   x
B)   q!
C)   :w
D)   :q

1.10   Which of the following below are true functionalities of shell?
A)   Authenticates user
B)   Interprets commands
C)   Allocates time and memory to programs
D)   Only A) and B)

2.   Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "OMR" answer sheet supplied with the question paper, following instructions therein.   (1x10)

2.1   The inode contains pointers to the data blocks of the file.

2.2   Relative path - exact path from root directory.

2.3   Runlevels are used to specify different configurations of running services.

2.4   Chmod changes the permissions of your home directory.

2.5   We can use one command to start more than one program at a time.

2.6   . /temp is a type of file system directory.

2.7   The vi editor starts in command mode.

2.8   A symbolic link cannot exist between two files on separate partitions.

2.9   > symbol is used to redirect the output of a command.

2.10   cat -all it does is copy standard input to standard output.

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 "OMR" answer sheet supplied with the question paper, following instructions therein.** **(1x10)**

	X		Y
3.1	sysadmin	**A.**	Light weight processes.
3.2	X server	**B.**	Data structure that contains metadata about a file.
3.3	Multiprogramming	**C.**	Show the current filepath .
3.4	Operating System	**D.**	To find files from a command shell.
3.5	traceroute	**E.**	Display the files in the directory by file size.
3.6	pwd	**F.**	Pattern search command.
3.7	locate	**G.**	Network Diagnostic Tools.
3.8	Inode	**H.**	Terminates a process.
3.9	root	**I.**	Management of the operation and control of I/O devices.
3.10	Threads	**J.**	Maintains exclusive control of the display.
		K.	Monitor system performance.
		L.	Also called the superuser.
		M.	Makes efficient use of the CPU by overlapping the demands for the CPU.

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 "OMR" answer sheet supplied with the question paper, following instructions therein.** **(1x10)**

A.	telnet	**B.**	OWNER	**C.**	ps
D.	lilo	**E.**	console	**F.**	uniq
G.	X-Server	**H.**	pipe `	**I.**	ping
J.	Label	**K.**	Daemons	**L.**	du
M.	wc				

4.1 Every process is associated with a particular user called the _____ who has privileges over the process.

4.2 Every Unix system has a main _____ that is connected directly to the machine.

4.3 _____ is a means by which one can initiate a Unix shell login across the Internet.

4.4 _____ are (background programs) on a system.

4.5 _____ loads the MBR, master boot record, into the memory.

4.6 _____ removes duplicates from a sorted list.

4.7 A _____ is a classic method of Communication, sends the stdout of one process to the stdin of another.

4.8 A variable is nothing more than a _____, a name assigned to a location or set of locations in computer memory holding an item of data.

4.9 _____ displays information about file size.

4.10 _____ will give you a list of the processes running on a system.

PART TWO
(Answer any **FOUR** questions)

5.
a)   What is X, and what is a window manager?
b)   List and describe the components of Linux System?
c)   Describe some important environment variables.

(4+6+5)

6.
a)   What is a zombie?
b)   How do I find files in Linux and Unix?
c)   How do I determine how much disk space I have in Linux or Unix?
d)   To see the last fifteen lines of the files dog, cat and horse. What command should be used?
e)   To create a compressed backup of the users' home directories. What utility should be used?
f)   What daemon is responsible for tracking events on your system?

(3+3+3+2+2+2)

7.
a)   Write a shell script to generate prime numbers.
b)   What is a CRON program?
c)   What are the Unix system calls for I/O?
d)   What are various IDs associated with a process?

(6+3+3+3)

8.
a)   What are the fields in the/etc/passwd file and how shadow passwords are given?
b)   Vim has multiple modes of operation, when are they used?
c)   What is Awk? Give the ouput of
```
awk 'BEGIN { for(i=1;i<=5;i++) print "square of", i, "is",i*i; }'
```

(5+5+5)

9.
a)   What is 'Inode'? Describe its structure.
b)   Discuss the role of a System Administrator.
c)   How are files transferred with FTP? Illustrate with an example.

(5+5+5)