

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 “inode” does not contain
 - A) File size
 - B) File name
 - C) Date of last access
 - D) Date of creation
 - 1.2 Which one of the following gives the line number of the current cursor position in “vi” editor?
 - A) <ctrl>h
 - B) <ctrl><shift>g
 - C) <ctrl><alt>h
 - D) <ctrl.>g
 - 1.3 The command “comm” Requires as input:
 - A) possibly more than one files
 - B) exactly a single file
 - C) exactly two files
 - D) no files
 - 1.4 “init” run-level for system administration is:
 - A) 3
 - B) 1
 - C) 2
 - D) 0
 - 1.5 Which one of the following is a multipurpose tool?
 - A) sed
 - B) grep
 - C) awk

D) all of the above

- 1.6 Multiple links of a file means:
- A) more than one name and multiple copies in disk
 - B) one name and one copy in disk
 - C) one name but more than one copy
 - D) single copy but more than one name
- 1.7 "NR" in "awk" denotes
- A) Word count
 - B) Character count
 - C) Line no.
 - D) None of the above
- 1.8 Which of the following keys when pressed will generate a shell signal
- A)
 - B) <shift><ctrl>a
 - C) <ctrl>a
 - D) <ctrl.>
- 1.9 State of a process changes from "ready" to "run" when
- A) Time slice expires
 - B) Waiting for disk read occurs
 - C) Waiting for user response occurs
 - D) Waiting for CPU in ready queue ends
- 1.10 A new process is created in Unix by the following command
- A) fork()
 - B) forks()
 - C) sfork()
 - D) frk()

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 In “vi” A appends text at the end of line.
- 2.2 In “vi” cl changes a line.
- 2.3 “x” is used to replace a single character in “vi”.
- 2.4 Formatted output is possible by “awk”.
- 2.5 “awk” is not a programming language but only a command.
- 2.6 Both “:x” and “:wq” in “vi” perform the same task.
- 2.7 “nohup” has to be suffixed to a command.
- 2.8 There is “endif” terminator for “if” statements in “awk”.
- 2.9 An ‘s’ in the “type” field of the command “ls -l” means that the corresponding file is a socket.
- 2.10 The shell built-in command “trap” setup a sequence of commands to be executed when a signal occurs.

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 | df | A. | touch |
| 3.2 | Default directory of a newly logged user | B. | Used in “vi” for appending text |
| 3.3 | Searching for files | C. | A variable that can be accessed via “vi” |
| 3.4 | Sorts file in ASCII collating sequence | D. | Execute and read right to all for <i>now</i> |
| 3.5 | /bin | E. | shows free disk space |
| 3.6 | /ver | F. | Contains executable files |
| 3.7 | :ab | G. | Execute right to all for <i>now</i> |
| 3.8 | chmod+x <i>now</i> implies | H. | Contains print jobs of users |
| 3.9 | PATH | I. | Contains library files of user |
| 3.10 | Command that can change access time of a file | J. | HOME |
| | | K. | shows Disk usage |
| | | L. | Used to abbreviate texts in “vi” |
| | | M. | A variable in shell programming language |
| | | N. | ls |
| | | O. | find |

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. | awk | B. | trap | C. | telnet |
| D. | Umask | E. | chgrp | F. | Xserver |
| G. | Inode | H. | mask | I. | comm |
| J. | cl | K. | In-core inode | L. | Wait |
| M. | Xterm | N. | diff | O. | insert |
| P. | Cmp | Q. | cc | R. | command |

- 4.1 In “vi” _____ changes a line.
- 4.2 To enter text in a new file “vi” will operate in _____ mode.
- 4.3 _____ can only be used by the owner of the file/directory.
- 4.4 _____ can be single-line programs also.
- 4.5 _____ setting determines default permissions that will be used when creating a file of directory.
- 4.6 The shell built-in command _____ sets up a sequence of commands to be executed when a signal occurs.
- 4.7 Remote login to a machine can be done via _____ command.
- 4.8 The command _____ tells which lines in a file have to be changed to make two files identical.
- 4.9 _____ is an X-client.
- 4.10 Description of an open file can be obtained from _____.

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

- 5.
- a) What are the types of commands that a shell recognises?
 - b)
 - i) Write a shell script to copy all files found in /mnt/cdrom to the /etc directory.
 - ii) Write a single line shell command to remove executable files in a particular directory that has a corresponding C-file.
- (6+[6+3])**

6. How will you perform the following tasks?
- i) Double-space a file.
 - ii) Removal of duplicate lines from a file.
 - iii) Print every line of a file twice.
 - iv) Use commands to locate the line containing the last occurrence of a pattern.
 - v) Searches for pattern "a" from files "b" and "c".
- (3x5)**

- 7.
- a) Explain the steps involved when a user tries to read a file.
 - b) What task does init perform? In this context also mention in detail the roles performed by related processes.
- (8+7)**

- 8.
- a) Mention the disadvantages of using pipes.
 - b) In Unix what is the reason for storing user names and their hashed passwords in separate files?
 - c) Consider the following table and print serial numbers for the managers with salary more than 15000\$.

| Employee ID | Name | Designation | Department | Date of Birth | Salary |
|-------------|-------------|-------------|------------|---------------|--------|
| 2256 | A.K. SEN | Manager | Sales | 01/01/69 | 16000 |
| 2334 | R. SINGHAL | Officer | Accounts | 02/12/66 | 15400 |
| 2987 | B. RAO | Director | Personnel | 03/02/58 | 20000 |
| 2992 | C.L. JHA | Manager | Personnel | 25/04/71 | 15000 |
| 3012 | S. KHAN | Officer | Accounts | 21/01/73 | 13000 |
| 3214 | T.M. VIKASH | Manager | R & D | 04/06/70 | 15500 |

(4+4+7)

- 9.
- a) How could you execute different types of jobs in Unix? What does the command "jobs" do?
 - b) What is a process? How are you able to get complete information about all currently scheduled processes?
- (8+7)**