CS/BCA (SUPPLE)/SEM-5/BCA-502/09
UNIX AND SHELL PROGRAMMING (SEMESTER - 5)

1. ....
   Signature of Invigilator

2. ....
   Signature of the Officer-in-Charge

Reg. No.

Roll No. of the Candidate

CS/BCA (SUPPLE)/SEM-5/BCA-502/09

ENGINEERING & MANAGEMENT EXAMINATIONS, AUGUST – 2009

UNIX AND SHELL PROGRAMMING (SEMESTER - 5)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B			Group – C				
Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

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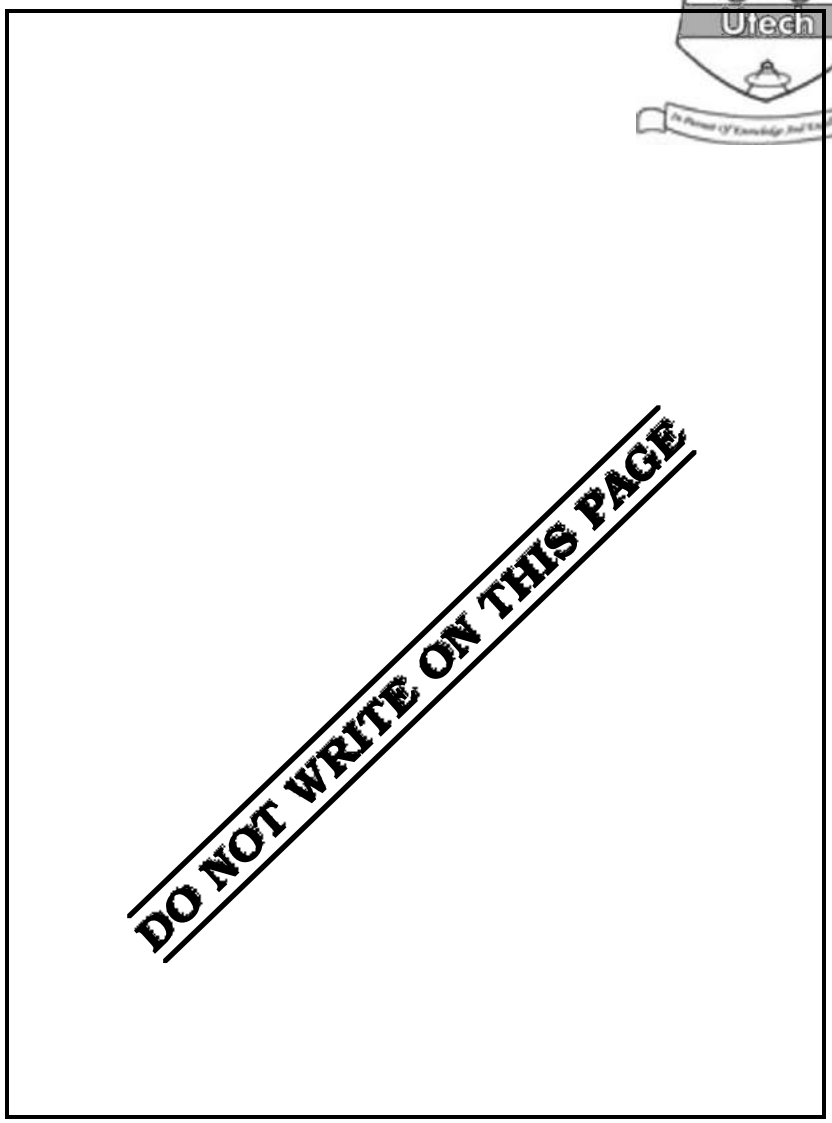
Head-Examiner/Co-Ordinator/Scrutineer

S-54019 (18/08)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CS/BCA (SUPPLE)/SEM-5/BCA-502/09
UNIX AND SHELL PROGRAMMING
SEMESTER - 5

Time : 3 Hours] [Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) File descriptor value of Std. error file in UNIX is

a) 0 b) 1

c) 2 d) 3.

ii) In – s is used to create

a) hard link b) symbolic link

c) dangling link d) none of these.

iii) echo $! displays

a) pid of current shell b) pid of foreground job

c) pid of parent shell d) pid of last background job.

iv) Process-id of swapper process is

a) 0 b) 1

c) 2 d) none of these.

v) To create a process we use

a) signal( ) b) fork( )

c) exec( ) d) both (b) and (c).

vi) Original content of file is present in

a) super block b) inode block

c) kernel d) data block. ☐

vii) Size of /dev/null is

a) 0 byte b) 1 kilobyte

c) variable d) none of these. ☐

viii) By default, kill command uses signal number

a) 9 b) 0

c) 15 d) none of these. ☐

ix) PPID of currently running background job after termination of parent shell is usually

a) 0 b) 1

c) pid of new shell d) pid of terminated shell. ☐

x) UNIX follows ..... CPU scheduling algorithm.

a) FCFS b) SJF

c) Round-Robin d) Priority. ☐

xi) Sticky bit is assigned by

a) + s b) + rwx

c) + b d) + t ☐

xii) ..... process is responsible for creating login prompt at terminal.

a) sh b) getty

c) login d) sched. ☐

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Write the significance of the following UNIX commands : 5 × 1

   i) mount

   ii) kill

   iii) umask

   iv) nice

   v) su.

3. a) What are the basic differences between UNIX and DOS ?

   b) What is the utility of vi editor in UNIX ? 2 + 3

4. Distinguish between the following : $2\frac{1}{2} + 2\frac{1}{2}$

   a) Internal command and external command

   b) Absolute path and relative path.

5. a) What is the significance of profile file in UNIX ?

   b) Explain init run level. 2 + 3

6. a) Explain the function of pipe.

   b) What do you mean by system call ? 3 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Write down the procedure at the time of system start up, after kernel is loaded.

   b) Describe different types of shell involved in UNIX.

   c) State the significance of IFS, PS1, PS2, HOME, PATH. 7 + 3 + 5

8. a) Write a shell script to generate all combinations of 3, 5 and 7 using for loop.

   b) Explain the difference between while loop and until loop with suitable examples.

   c) What command would give user read, write and execute permission, group members execute permission and give others only read permission for a file ? Use both relative and octal notations.

   d) What do you understand by filter ? 5 + 4 + 4 + 2

9. a) What do you understand by single indirection, double indirection and triple indirection in UNIX file structure ?

   b) What is the difference between inode number and magic number of a file ?

   c) Explain foreground and background job execution in UNIX.

   d) How can you distinguish a directory and a file in UNIX ? 5 + 2 + 5 + 3

10. a) Write a shell script to check whether a given number is Armstrong or not.

    b) Explain Kernel-shell-user relationship.

    c) What are the outputs of the following ?

    set only god is in a position to look down upon someone

    echo $9 $10 $11 $*

    shift

    echo $8 $9 $10 7 + 5 + 3

11. a) What is the difference between hard link and soft link ? What is dangling link ?

    b) Write a shell script where login name is supplied as command line argument to find out at how many terminals the user has logged in.

    c) Define orphan process and zombie process.

    d) What are the functions of fork( ), exec( ), wait( ) ?

    e) What is the difference of running a background job with nohup command and without nohup command ? 3 + 4 + 3 + 3 + 2

END

Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/BCA/SEM-5/BCA-502/2010-11

2010-11

UNIX AND SHELL PROGRAMMING

Time Allotted : 3 Hours | Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

$10 \times 1 = 10$

i) What does kill $! do ?

a) Kills all processes spawned by user

b) Kills all background processes

c) Kills the most recent background processs

d) Kills the oldest background process.

ii) The command for deleting a directory which is not empty is

a) rmdir b) rm – r

c) rm* d) rm – rd.

iii) To see the last access time of various files in a file system the command is

a) ls – lu b) ls – l

c) ls – lat d) ls – mt.

iv) The command cal j 1997 would give the output as

a) the calendar of January, June and July 1997

b) only calendar of January 1997

c) an error

d) none of these.

v) Each entry in inode table is of size

a) 64 kB b) 32 kB

c) 32 bytes d) 64 bytes.

vi) The command cut – f 2, 8 – d " : " file 1 would output

a) the fields 2 to 8 from file 1 where delimiter between fields is :

b) the fields 2 to 8 from file 1 including the delimiter : between fields

c) the columns 2 to 8 from file 1 with : between each column

d) none of these.

vii) The UNIX command "a.out / &" runs the program a.out

a) with highest priority

b) in the background

c) only when no other process is running on the system

d) none of these.

viii) The hidden file in UNIX

a) has a special bit associated with the descriptor

b) has names starting with a dot

c) can be accessed only by the operating system kernel

d) none of these.

ix) In UNIX, mounting a file system means

a) copying all the files from one file system to another

b) moving all the files from one file system to another

c) loading a file system from backup medium like tape

d) providing a link to the file system to be mounted so that it appears as a local sub-directory.

x) $? represents

a) number of arguments specified in command line

b) name of executed command

c) exit status of last command

d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What are the similarities between thread and process ?

3. What are the different kinds of threads ?

4. What is the functionality of kernel in UNIX architecture ?

5. What does "bulk loading of a table" mean ? Indicate advantages and disadvantages of using these features.

6. Briefly explain three phases involved in process creation.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Write the commands for the following : 5×3

   a) To list find the records of a file containing 10 different strings

   b) To convert a general file to a hidden file

   c) To select the lines that have exactly two characters using grep command.

   d) To find the 51st record of a file containing 100 records in unit.

   e) Used for temporary switch user.

8. a) How is a new process in Unix created ? What is the new process called ? Give the syntax of the corresponding system call. What operations are performed by the kernel for this system call ?

   b) What are file system quotas ?

   c) What is the special feature of the X window architecture ? What are X widgets ? $7 + 4 + 4$

9. a) What are file access permissions ? How can you change the file access permissions ? Explain.

   b) What is the relationship between the priorities of kernel processes and user processes ? Can a user modify the priorities of kernel processes ?

   c) What are the main functions performed by Unix System Administrator ? 5 + 5 + 5

10. a) Write commands to do the following :

   i) Display the list of users currently logged in along with their count on the terminal.

   ii) Terminate the last background process without knowing its PID such that it cannot ignore the signal to terminate it.

   iii) Use the current working directory along with the user name as the prompt.

   iv) Count the number of files in the directory tree / usr /abc.

   v) Count the number of blank lines in a file.

   b) Write a crontab entry to execute run.sh script every 30 minutes on every Tuesday, Thursday and Saturday between 9 am to 5 pm. 10 + 5

11. Write short notes on any *three* of the following : 3 × 5

a) Directory in Unix

b) Domain Names Services (DNS)

c) Process Control Block (PCB)

d) Unix File system layout.

Name : .....

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CS/BCA/SEM-5/BCA-502/2011-12

2011

UNIX AND SHELL PROGRAMMING

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

   i) Sort–*n* emp

      a) sort by primary key

      b) numeric sorting

      c) sort by secondary key

      d) none of these.

   ii) $$ represents

      a) number of arguments specified in command line

      b) name of the executed command

      c) exit status of the last command

      d) PID of the current shell.

iii) How would you check that two numbers are equal ?

a) test $a – eq $b b) test $a = $b

c) test $a == $b d) none of these.

iv) The startup file for vi editor is

a) .profile b) .login

c) .startup d) none of these.

v) The command pr–d formats input

a) can be numbered

b) is double spaced

c) offset from the left

d) none of these.

vi) If administrator wants to see the password of user, he will search for the file

a) etc/shadow b) etc/password

c) etc/null d) none of these.

vii) The PID is generated by

a) shell

b) kernel

c) both shell & kernel

d) none of these.

viii) Address relocation is done by

a) NIS b) Linus administrator

c) Linker d) none of these.

ix) The state of the file system is contained in

a) Inode block b) Boot block

c) Super block d) Data block.

x) To see the last access time of various files in a file system the command is

a) ls – lu b) ls – l

c) ls – lat d) ls – mt.

xi) Your shell script has a name 1s. If you execute 1s

a) your script would get executed

b) the 1s command would get executed

c) whether script is executed or command is executed depends upon the value of PATH

d) both 1s and the script would get executed one after another.

xii) To copy a file "file l" to "file 2" which of the following commands will you use ?

a) cat file1 file 2

b) cat file 1 0>file2

c) cat 1> file2 0< file1

d) cat 2> file2 0<file1.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Differentiate between LILO and GRUB.

3. a) Write a single command in unix to do the following : 2

Output of who should be displayed on the screen with value of total number of users who have logged in displayed at the bottom of the list.

b) Interpret the following command : 2

grep "^[^^]" filename

c) Name the process whose pid is zero. 1

4. a) Write a command line to count the number of times a specific character, say "?" appears in a given file. 2

   b) What should be the output of the following shell script :

```
x=
[ –n $x ]
echo $?
[ –z $x ]
echo $?
```

   2

   c) What does kill $! do ? 1

5. a) What are block and character devices ? 2

   b) What are the different run levels in UNIX ? 3

6. Explain UNIX file system briefly.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Draw a neat block diagram to represent the System Kernel and describe the functions of various modules in it. 6

   b) What do you mean by physical and logical blocks ?
   A unix file system has 0·5 kB block size with 32 bit address. The inode has 12 direct, one indirect, one double indirect and one triple indirect address. What is the maximum file size it can access ? 2 + 4

   c) Why is the memory copy of inode block and super block required ? 3

8. a) What do you understand by PATH variable ? How does the kernel access a file ? 2 + 3

   b) You tried to copy a file foo from another user's directory, but you got the error message "cannot create file foo". You have written permission in your own directory. What could be the reason and how do you copy the file ? 2 + 2

   c) Which file attributes change when you copy a file from another user account ? 1

   d) Use find to remove all the files which are modified one month before from the posix directory under your parent directory. 3

   e) How is chown different from chgrp when it comes to renouncing ownership ? 2

9. a) Write a shell script to check whether a string is palindrome or not. 5

   b) Write a shell script to list all primes upto n. 5

   c) Write a shell script to list all Armstrong numbers up to 1000. 5

10. a) What is unique command ? Explain with example. 4

    b) Arrange the data of a file in ascending and descending orders. 4

    c) Write a shell script to check whether a file is readable, writeable or executable. 5

    d) Explain the command to print all characters in a file. 2

11. Write short notes on any *three* of the following : 3 × 5

a) Symbolic Link

b) Mounting of file system

c) Device files

d) At and batch command

e) IFS

f) Sticky bit

g) Standard input, standard output and standard error.

Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/BCA/SEM-5/BCA-502/2012-13

2012

UNIX AND SHELL PROGRAMMING

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

   i) To counting number of lines in a file which command is used

      a) cat b) ls

      c) wc d) chmod.

   ii) In the core of the operating system is called

      a) hardware b) kernel

      c) shell d) *X*-window.

   iii) Which one works as interface between the user & the kernel ?

      a) Hardware b) Kernel

      c) Shell d) *X*-window.

iv) To display an informative listing of the users ..... is used.

a) who b) ls

c) both (a) and (b) d) none of these.

v) To remove a directory ..... command is used.

a) rmdir b) mkdir

c) tree d) none of these.

vi) To know your current directory we use

a) cd b) chmod

c) both (a) and (b) d) pwd.

vii) The UNIX command 'cp ch * book'

a) copies all files starting with ch to the directory book

b) copies all files with three character names and starting with ch to the directory book

c) compares whether file starting with ch exists in directory book

d) none of these.

viii) Suppose the current directory is / home / user / *xyz* / prog. A possible command to change to a directory / home / user / *abc* / letter is

a) cd .. / .. / *abc* / letter

b) cd ./ ./ *abc* / letter

c) cd ./ home / user / *abc* / letter

d) none of these.

ix) The UNIX command 'rm –r project' will

a) delete the file project from the current directory

b) delete all the files from the directory project

c) recursively delete the directory project and all its sub-directories

d) none of these.

x) The hidden file in UNIX

a) have a special status bit associated with the file descriptor

b) have names starting with a dot

c) can be accessed only by the operating system kernel

d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following $3 \times 5 = 15$

2. How do you change File Access Permissions in Unix ?

3. What is i-node ? Explain fields of an i-node. 2 + 3

4. Discuss mount and unmount system calls.

5. What happens when you execute a program ? Define zombie. 3 + 2

6. Define hard link and soft link.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Describe mechanism of process creation. How a shell is created ? What are internal and external commands ? Where are the security levels available in UNIX ? 5 + 3 + 4 + 3

8. Define kill command. How you can kill the last background job ? How you can execute a low priority job before a high priority job ? What are the different environment variables in Unix ? Explain ps command. 2 + 3 + 3 + 3 + 4

9. What are piping operators ? What is redirection ? Describe different redirection operators. Write a shell script to find out prime numbers within 100 to 500. 2 + 2 + 3 + 8

10. a) What is quoting ? What are three quote tokens ?
    b) What is regular expression ? List out the components of it.
    c) What are egrep and fgrep ? Give examples.
    d) Differentiate between line editor and screen editor.

    (2 + 2) + 4 + 4 + 3

11. Write short notes on any *three* of the following : 3×5
    a) gzip and gunzip
    b) awk
    c) tar
    d) Common shells in Unix.

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Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/BCA/SEM-5/BCA-502/2013-14

2013

UNIX AND SHELL PROGRAMMING

Time Allotted : 3 Hours *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

   i) The UNIX command 'a.out\& runs the program a.out
      a) with highest priority
      b) when no other process is running on the system
      c) in the background
      d) none of these.

   ii) The cal command is used to
      a) show calendar b) use calculator
      c) do calculations d) none of these.

   iii) pwd command is used for
      a) change password of administrator
      b) change password of user
      c) view the current working directory
      d) all of these.

iv) The command used to see the user processes is

a) ps b) process

c) ls d) dir.

v) The available disk space under UNIX can be determined by

a) dir b) df

c) cp d) ls.

vi) In UNIX mounting means

a) copying all the files from one file system to another

b) moves all the files from one file system to another

c) loading a file system from backup medium like tape

d) providing a link to the file system to be mounted so that it appears as a subdirectory.

vii) The hidden file in UNIX

a) has special status bit associated with the file descriptor

b) has names starting with dot

c) can be accessed only by the operating system

d) none of these.

viii) The chmod command in UNIX

a) changes the current execution status from user mode to kernel mode

b) makes a file hidden

c) changes the access permission of a file or directory

d) none of these.

ix) Chown command in UNIX changes

a) file permission b) ownership of a file

c) priority of a process d) none of these.

x) Basename student. lst lst-the output of this command is

a) student b) student.

c) lst d) .lst

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What do you mean by Internal and External commands ?
3. What are the different run levels in UNIX ?
4. What is the utility of ls and ls-a command ?
5. What is *i*-node ? Explain different attributes of *i*-node.
6. How will your replace "You" with "us" in vi editor ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Write the command you will give to set read, write and execute permissions, group member read and execute permission and others only read permission for a file named zyx.txt. 5

b) State the importance of PID and PPID. Which process has the maximum number of child processes ? 5

c) Write a shell script to print all the odd numbers from 1 to 15. 5

8. a) Briefly explain the features of UNIX operating system. 5

   b) Briefly state with syntax and example the following loops : while, until, for. 5

   c) What do you understand by root directory ? 3

   d) What is the importance of home directory ? 2

9. a) What is a process ? 2

   b) Explain briefly foreground and background job execution in UNIX system. 3

   c) Explain with examples egrep and fgrep. 5

   d) Write briefly on the following commands :

   mount, umask, fsck, kill. 5

10. a) How can you use 'cat' command to create a new file in UNIX ? Explain with example. 3

    b) Write a shell script to check whether a file is readable, writeable or executable. 6

    c) Explain the shutdown command with at least two options. 4

    d) Can ordinary user invoke shutdown command ? Explain the significance of run level 0, 1, 6. 2

11. Write short notes on any *five* of the following : 5 × 3

    a) Cal

    b) Touch

    c) Basename

    d) UNIX external and internal commands

    e) Who

    f) Mailx.

BCA-502

UNIX AND SHELL PROGRAMMING

Time Allotted: 3 Hours | Full Marks: 70

The questions are of equal value.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP A
(Multiple Choice Type Questions)

1. Answer all questions. $10 \times 1 = 10$

(i) Double quotes protect all characters but permit

(A) variable evaluation (B) command substitution
(C) both (A) and (B) (D) piping

(ii) In Linux, to echo a string and keep the cursor on the same line, you have to use

(A) the –e option (B) the escape sequence
(C) both (A) and (B) (D) either (A) and (B)

(iii) The user startup file for Bourne shell is stored in the home directory with the name

(A) cshrc (B) .init
(C) .login (D) .startup

(iv) The Unix file system is characterized by

(A) a hierarchical structure (B) the protection of file data
(C) the ability to create and delete files (D) all of these

(v) Process switches from user modes to kernel modes is known as

(A) context switching (B) mode switching
(C) privilege changing (D) process switching

(vi) The password encryption file is stored in the file

(A) /etc/passwd (B) /etc/shadow
(C) /etc/group (D) both (A) and (B)

(vii) The alias command can be used in Unix to

(A) assign the same name to two files
(B) change the name of a file
(C) produce a listing of the login ids of all users in the system
(D) none of these

(viii) The directory file in Unix contains

(A) only file names (B) only inode numbers
(C) both of these (D) super block

(ix) The $! represents

(A) PID of last background job
(B) name of executed command
(C) number of arguments specified in command line
(D) exit status of last command

(x) What will be the output of test $x – gt $y (when x = 7.2 and y = 7)

(A) 1 (B) 0
(C) error (D) command not valid

GROUP B
(Short Answer Type Questions)

Answer any *three* questions. 3×5 = 15

2. (a) Explain the architecture of UNIX operating system. 3
   (b) What do you mean by positional parameters in shell programming? 2

3. (a) What is umask? How can file permission be defined with it? 3
   (b) What is touch command? Explain with an example? 2

4. What is inode in the UNIX file system? List down the main fields consisting a disk inode. What is the difference between disk inode and in-core-inode? 2+2+1

5. What is grep and sed command? Describe their function with example.

6. Write a shell script that will accept a pattern "printf" and a file name from the user and display all the lines containing the pattern "printf" within that file. 5

GROUP C
(Long Answer Type Questions)

Answer any *three* questions. 3×15 = 45

7. (a) Perform the following operation on the file, containing employee data (emp.lst) in text format and each field is delimited by (:) : 4×3=12
   (i) To cut the 2nd, 3rd, and 6th fields of a file and display.
   (ii) To sort on 4th field of the file numerically
   (iii) To display 3rd, 4th and 5th lines of the file.
   (iv) To replace the field delimiter (:) by (|)
   (b) Explain $#, S*, $@ special parameters of shell. 3

8. (a) What is function of test command? 3
   (b) Write a shell script which will take a word and file name. If the file exists, then it finds the word from the given file name, it will display the lines containing the word, otherwise it will display "Records not found". 5
   (c) How can you make out whether two files are copied or linked? 2
   (d) Describe the two main functions of init. What is the significance of run level 0, 1 and 6? 2+3

9. (a) A UNIX file system has 512 KB block size with 32 bit address. The inode has 10 direct, one single indirect, one double indirect and one triple indirect addresses. What is the maximum file size it can access? 7
   (b) Describe the layered architecture of UNIX operating system. Write down the services provided by the UNIX kernel the context of a process. 8

10.(a) What is the difference between process run with & and run with nohup? 2

(b) What do you mean by job scheduling in UNIX? Explain with the help of proper example. 5

(c) Explain the difference between (i)ls –l and ls –lt (ii) ls –lu and ls –lut. 4

(d) Describe init and getty process for logging the system. 4

11.(a) Write a shell script to print all prine numbers between 1 to n (must be input by user). 7

(b) Write a shell programming to generate Fibonacci series up to n number. 8

12. Write short notes on any *three* of the following: 3×5

(a) Interprocess communication

(b) UNIX File System

(c) Shell's Treatment of command line

(d) Vi editor

(e) Filter in UNIX.

MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

BCA-502

UNIX AND SHELL PROGRAMMING

Time Allotted: 3 Hours | Full Marks: 70

The questions are of equal value.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable. All symbols are of usual significance.

GROUP A
(Multiple Choice Type Questions)

1. Answer any *ten* questions. 10×1 = 10

(i) The 'logout' built in command is used to

(A) shutdown the computer
(B) logoff of the computer
(C) logout the current user
(D) to exit the current shell

(ii) The command 'umask –S'

(A) prints the current mask using symbolic notation
(B) prints the current mask using octal numbers
(C) sets the mask to 000
(D) sets the mask to 777

(iii) Which option of the kill command sends the given signal name to the specified process?

(A) –l (B) –n

(C) –s (D) –a

(iv) Which command puts a script to sleep until a signal is received?

(A) Sleep (B) Suspend

(C) Disown (D) Break

(v) The command 'ulimit'

(A) set a limit on specified resource for system users

(B) set/show process resource limit

(C) both (A) and (B)

(D) none of these

(vi) Which command wait for the specified process to complete and return the exit status?

(A) Sleep (B) Wait

(C) Delay (D) Stop

(vii) Which command prints the accumulated user and system times for processes run from the shell?

(A) Time (B) Times

(C) Both (A) and (B) (D) None of these

(viii) The expression expr –9% 2 evaluates to

(A) 0 (B) 1

(C) –1 (D) 2

(ix) Create a new file "new.txt" that is a concatenation of "file1.txt" and "file2.txt"

(A) cp file.txt file2.txt new.txt

(B) cat file1.txt file2.txt > new.txt

(C) mv file [12].txt new.txt

(D) ls file1.txt file2 txt | new.txt

(x) Which shell offers a command history feature?

(A) C shell (B) Visual shell
(C) Bourne shell (D) Korn shell

(xi) Which command is used to remove a print job from the print queue?

(A) lprm (B) lpq
(C) lpstat (D) none of these

(xii) 'chown' command changes the

(A) home directory of a user
(B) access permission of a file or directory
(C) priority of a process
(D) none of these

GROUP B
(Short Answer Type Questions)

Answer any *three* questions. 3×5 = 15

2. Differentiate between multi programming and multi tasking. What are the differences between relative and absolute path? 3+2

3. What is daemon process? What is the difference between cd and cd..? 2+3

4. What are the different ways of using chmod? 5

5. Draw the UNIX architecture. What are the different parts of it? 3+2

6. What is i-node? What does it contain? 1+4

7. What is filter? Describe the function of any two filters. 2+3

GROUP C
(Long Answer Type Questions)

Answer any *three* questions. 3×15 = 45

8. (a) Write a shell program to find prime numbers between 1 to n. 7
   (b) What do you understand by PATH variable? How does the kernel access file? 2+3
   (c) What is unique command? Explain with example. 3

9. (a) Describe the log in process briefly. 5
   (b) Describe the ps -f command in detail. 5
   (c) Describe the modes of vi editor. 5

10. (a) Write a shell program to generate fibbonaci series. 6
    (b) Write a shell program to reverse a number. 7
    (c) How to copy 4 lines and paste it to another file in vi editor? 2

11. Write short notes on any *three* of the following: 3×5
    (a) Soft link and Hard link
    (b) Mounting and unmount
    (c) Background job execution
    (d) ls command
    (e) IFS

MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : BCA-502

UNIX AND SHELL PROGRAMMING

Time Allotted : 3 Hours | *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

   i) What does kill $! Do ?
      a) kills all processes spawned by user
      b) kills all background processes
      c) kills the most recent background process
      d) kills the oldest background process.

   ii) The command for deleting a directory which is empty, is
      a) rmdir b) rm –r
      c) rm* d) rm –rd.

   iii) To see the last access time of various files in a file system the command is
      a) *ls-lu* b) *ls*-1
      c) *ls-lat* d) *ls-mt*.

iv) The command cal j 1997 would give the output as
   a) the calendar of January, June and July 1997
   b) only calendar of January 1997
   c) an error
   d) none of these.

v) The available disk space can be determined under UNIX using the command
   a) dir b) df
   c) du d) file.

vi) Echo '$SHELL' will print
   a) SHELL
   b) $SHELL
   c) value of SHELL variable
   d) none of these.

vii) $? represents
   a) no. of arguments specified in command line
   b) name of executed command
   c) exit status of last command
   d) none of these.

viii) The command cp [!0-9] ?? Prog will
   a) copy all files started with not a number to Prog directory
   b) copy all files whose file name is three characters in length started with not a number to Prog directory
   c) both of these
   d) none of these.

ix) How could you check that two strings are equal ?
   a) test $a – eq $b b) test $s – equal $b
   c) test $a = $b d) test $a = = $b.

x) Sort –n emp is
   a) sort by primary key
   b) numeric sorting
   c) sort by secondary key
   d) none of these.

xi) UNIX uses ls to list files in a directory. The corresponding command in MS environment is

a) if b) listdir

c) dir d) none of these.

xii) Which of the following files in the current directory is identified by the regular expression a?b* ?

a) afile b) aab

c) abb d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What is the difference of running a background job with nohup command and without nohup command ? What is sticky bit ? 4 + 1

3. a) What do you mean by absolute pathname and relative pathname ?

b) Is it possible that two files have same *i*-node number ? Justify. 2 + 3

4. How is a process created ? Mention briefly the role of the fork and the exec system calls in process creation.

5. Write a shell script to check whether an integer is prime or not.

6. What does the directory file contain ? What does *cd* do when used without argument ? 3 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is *i*-node ? What is the purpose of it ? In what way a programmer can use *i*-node ?

b) What will be the output of the command *cat file 1 file 1 file 1* ?

c) Explain the role of the set-user-id and sticky bit.

d) Write a shell script to print only those words of the file FILE, whose beginning and last characters are same. 5 + 1 + 2 + 7

8. a) Write a shell script to check whether a string is palindrome or not.

   b) Write a shell script to list all primes up to *n*.

   c) Write a shell script to list all Armstrong numbers up to 1000. 5 + 5 + 5

9. a) A file name MARKS consists of Name, Marks1, Marks2, Marks3 and Marks4 fields, separated by comma. Print the marks of those whose average marks are equal to or greater than 50%, in descending order of average marks, followed by alphabetical order of name in the following format :

   Sl. No. Name Avg. Marks

   b) Write a shell script to print given number in reverse order, for example, if number is 123 then it must be printed as 321. 8 + 7

10. a) Write a shell script to delete all files in root and its subdirectories having extension 'tmp', which have not been created or referred to in the last 15 days.

    b) Explain the structure of UNIX file system. 7 + 8

11. Answer any *three* of the following : 3 × 5

    a) Describe internal and external UNIX commands

    b) Describe any four shell variables.

    c) Interpret the following instructions :

    (i) ls –a*

    (ii) cp ?aa* ? ab*

    d) Explain grep with example.

MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : BCA-502

PUID : 05145 (To be mentioned in the main answer script)

UNIX AND SHELL PROGRAMMING

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the fcllowing : $10 \times 1 = 10$

   i) Which part of the UNIX operating system interacts with the hardware ?
   a) Kernel b) Shell
   c) Vi editor d) Application program.

   ii) What is the PID of the first process that is set up when the system is booted ?
   a) 1 b) 0
   c) any d) 2.

   iii) Programs and process are synonymous.
   a) True b) False.

   iv) Which command is used for preparing a file for printing ?
   a) cd b) cat
   c) print d) pr

v) pr command adds ..... lines of margin at the top and bottom.
   a) 5 b) 4
   c) 2 d) 1.

vi) Test statement cannot
   a) compare two numbers
   b) compare two strings
   c) compare two files
   d) check a file's attributes.

vii) Which of the following keywords are used in while loop ?
   a) do b) done
   c) then d) do and done.

viii) Which of the following expression is a correct wildcard pattern if we want an expression in which the last character is not numeric ?
   a) * [!0] b) * [0-9]
   c) [0-9] d) * [!0-9].

ix) What is a directory file ?
   a) A directory containing data
   b) A directory containing details of the files and subdirectories it contains
   c) A directory contains files
   d) A directory containing data and files.

x) The most common file type is
   a) Ordinary file b) Database file
   c) Data file d) None of these.

xi) Each entry of directory file has component(s) namely
   a) filename
   b) inode number
   c) filename and inode number
   d) file size.

xii) Which of the following is a feature of UNIX ?
   a) Multitasking b) Multiuser
   c) Portability d) All of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Briefly explain the tty command in UNIX.

3. Briefly explain the following commands : 3 + 2

   i) cp

   ii) cat.

4. What do mean by UNIX process life cycle ? Give a neat diagram of the UNIX process life cycle. 3 + 2

5. Write a shell script (i) to show all files having extension .sh, (ii) to show all files whose names are 3 characters long, and (iii) to show all files whose names are beginning with letters a, b, c. $1\frac{1}{2} + 1\frac{1}{2} + 2$

6. a) What are the significance of the following environment variables ?

   HOME, PATH, USER. 3

   b) Briefly explain the use of aliases in UNIX. 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What will be the output of the following ? 7×2

   i) ls *.txt

   ii) mv * ../test

   iii) cp foo foo*

   iv) cp ????? test

   v) lp note[0-1][0-9]

   vi) rm *.[!t] [!x] [!t]

   vii) cp-r/home/user/{c,java}

   b) What is character class in UNIX ? 1

8. a) A file (file 1) contains the following four patterns :
Agarwal, agrawal, Aggarwal and aggarwal.
How to search all of them using BRE character subset ? How to search metacharacters in a file ?
3 + 2

b) Briefly explain grep-E with suitable examples. 5

c) Write the commands to do the following using grep :

i) Search the string "HELLO" from the file file 1 if it occurs at the very beginning of a line,

ii) Search the string "HELLO" from the file file 1 if it occurs at the end of a line,

iii) Search the string "HELLO" from the file file 1 if it is the only word in the line. 2 + 2 + 1

9. a) Write a shell script, which receives two filenames as arguments, checks whether the two files contents are the same or not and if they are same then the second file is deleted. 7

b) Write a shell script to generate all combinations of 1, 2 and 3. 8

10. a) Briefly explain Kernel and Shell in UNIX. 3 + 3

b) How to display the system date in UNIX ? Give the command to display the present month and month name. Give the command to display the date in mm/dd/yy format. Briefly explain with suitable example the use of echo command in UNIX.
2 + 2 + 2 + 3

11. How to list the file attributes in UNIX ? What are the attributes being listed ? What do you mean by hard link and soft link ? 1 + 7 + 4 + 3