B.Sc. (IT) (Semester - 3)
Practical List
IT4026 Operating System (PRACTICAL)

Practical No : 1	**Enrollment No:**

Write a date command to do the following:

1. Display future date. (after one day/week/month/year)
2. Display in the format dd/mm/yy hh:mm:ss
3. Display date
    a. 2 years ago.
    b. 10 days ago.
    c. 50 seconds ago.
    d. Previous day.
4. Display time in GMT.
5. Show output of the following commands:
    a. date "+This is Date"
    b. date "+This is Date: %B"
6. Display time in 24 hours format HH:MM.
7. Display time in 12 hours format.
8. Display today's week day. i.e. Monday
9. Display date in format as 10 July 2024
10. Display Full Date and Time with Day, Month, Date, Time, and Year.

Write a cal command to do following:

11. Display calendar of current month.

12. Display calendar of current year.
13. Display calendar of January month of 2030 year.

Write ls command for following:

14. Display all files Include hidden files and directories.
15. Display all files including hidden files created by system.
16. Sort files and directories by their sizes, listing the largest ones first.
17. Display all file names in one column.
18. List directories themselves, rather than their contents.
19. List all file names having only one character length.
20. List filenames with their inode numbers.
21. Display long listing of file.

Perform following command by considering that you are in your home directory.

22. Check your current working directory.
23. Create a directory UTU and three sub directories named BScIT, MScIT and BCA.
24. Create directory fy, sy and ty in BScIT directory.
25. Create unix directory in sy directory.
26. Write a single command to perform 23 to 25.
27. Write a command to move back to home directory.
28. Write a command to change your current working directory to unix.
29. Write a command to go to parent directory.
30. Write a command to change your current working directory to MScIT.

31. Write a command to display files of /.
32. Write a command to remove BCA directory.
33. Write a command to display complete directory structure you created.
34. Perform command cd –. Observe your current working directory.
35. Change your current working directory to unix and create two text/regular files named as first and second.
36. Write a command to rename the file first as myfirst.
37. Write a command to copy file second as copysecond
38. Write a command to cut file second and paste it to parent directory.
39. Copy unix directory to ty directory along with its files.
40. Remove myfirst file from ty directory.
41. Remove directory unix from ty directory.

Write bc command for the following:

42. To evaluate "41/2". Answer should contain 5 decimal places.
43. To convert 82 from decimal to hexadecimal.
44. To print digits from 1 to 10 using for loop.
45. To convert 1001 from binary to decimal.

Solve following using echo command or write output/error:

46. Write output of echo ls.
47. Write output of echo “ls”
48. Write output of echo `ls`. # back quote

49. echo Welcome to the LINUX's world.
50. echo {smart, analog, black, white}watch
51. echo -e "Hello \c world."
52. echo "Hello \c world."
53. echo *
54. echo "0 && 0" | bc
55. echo "0 || 0"
56. echo "0 && 1" | bc
57. echo "0 || 1" | bc
58. echo "4*4+6"|bc*
59. echo "5*4+3"|bc
60. echo "length(56789)" | bc
61. echo "length(56789)"
62. echo "1 == 2" | bc
63. echo "10 == 10" | bc
64. echo "10 == 1 || 1 == 2" | bc
65. echo "10 == 10 || 1 == 2" | bc

Shell related commands:

66. Write a command to display current shell.
67. Write a command to run korn shell.
68. Write a command to run bourn shell.

69. Write a command exit and check your shell before and after.
70. Write a command to display login shell.
71. Write a command to display value of environment variable HOME.
72. Write a command to display value of environment variable PWD.
73. Write a command to display value of environment variable USERNAME.
74. Write a command to display value of environment variable PATH.
75. Write a command to display value of environment variable PS1, PS2, PS2, PS4.

Objective(s)	• Students will be able to learn **date** command with options and formats. • Students will be able to learn **cal** command with options. • Students will learn **echo** command with options & escape sequences. • Students will learn **bc** command with options & conditional statements. • Students will be able to get an idea of using **bc** command with piping mechanism. • Students will learn **ls** command with options. • Student will learn operations on directory and file.
Pre-requisite	✓ Use shell to run commands & usage of date command. ✓ Usage of **bc** command, use of 'banch calculator' in interactive mode. ✓ Usage of **echo** command and pipe. ✓ Usage of **ls** command, meaning of all options. ✓ Usage of **ls** & **echo** command and meaning of different meta characters.
Duration for completion	5 hours
PEO(s) to be achieved	**PEO1**: To provide sound foundation in the fundamentals of computer application along with analytical, problem-solving, design and communication skill for life-long learning in chosen field. **PEO2**: To provide quality practical skill of tools and technologies to solve industry problems.
PO(s) to be achieved	**PO6**: Ability to use the techniques, skills and modern tools as necessary for software development.
Solution must contain	Command, output and interpretation
Nature of submission	Handwritten
Reference for solving the problem	Book: i. Forouzan B. A., Gilberg R. R., UNIX and Shell Programming, Thomson ii. Das S., UNIX aoncepts and Applications, McGraw Hill
Post laboratory questions	Write syntax of following command with few useful options. ls, mv, cp, mkdir, rm, rmdir, echo, date, cat, touch, cd
Signature:	

Practical No : 2	**Enrollment No:**

1. Write a script to input name, age, gender and course and display it in proper format.
2. Write a script to display input number is positive, negative or zero.
3. Write a script to find smallest number amongst three numbers that are read from the keyboard.
4. Write a script that read a three digits number from the keyboard and check whether the number is Armstrong or not.
5. Write a script that calculate area and perimeter of a rectangle, and area and circumference of the circle.
6. Write a script that should display message like “Good Morning”, “Good Afternoon”, “Good Evening” or “Good Night” based on the time when you are executing that script.
7. Write a script to input the year of joining of an employee, name, salary and the current year through keyboard. If the years of service are greater than 3 then employee is given a bonus of Rs. 3000. Display employee information along with eligible bonus.
8. A mathematics student has three equation with him :
   $x = 20$
   $z = a^2 + 2ab$
   $c = b^2 - x - 2z$
   Write a script that accept a, b as an input from user and print the value of c.
9. Write menu driven script to perform arithmetic operations based on choice from user on floating point values.
10. Write a script to print multiplication table of input number.
11. Write a script to print the Fibonacci series.
12. Write a script to input a number and display following pattern up to inputted number.
    If inputted number is 5 then pattern will be:

```
* * * * *
* * * *
* * *
* *
*
```

13. Write a script to input a number and display following pattern up to inputted number.
    If inputted number is 5 then pattern will be:

```
    *
   * *
  * * *
 * * * *
* * * * *
```

14. Write a script to input a number and display following pattern up to inputted number. If inputted number is 4 then pattern will be:

```
        *
      *   *
    *       *
  *           *
    *       *
      *   *
        *
```

15. Write a script to input a number and display following pattern up to inputted number.
    If inputted number is 5 then pattern will be:

```
    0
   0 1
  0 1 0
 0 1 0 1
0 1 0 1 0
```

16. Write a script to input a number and display following pattern up to inputted number.

If inputted number is 5 then pattern will be:
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1

17. Write a script to input a number and display following ladder pattern.
|_
|_
|_
|_
|_
|_
18. Write a script to display command line arguments 3 in each line. If command line argument is not provided then display proper message.
19. Write a script to check exactly one command line argument provided to the script. Also check provided argument is number or string. Write appropriate message if command line arguments not provided or not exactly one.
20. Write a script to accept number as a command line argument and display it in word form. i.e 453 -> Four Five Three
21. Write a script to accept numbers from the command line argument and display sum of 1 to given number for each arguments.
i. e. 5 3 4 provided as command line arguments then output contains 15 6 10
22. Write a script that accepts number as command line argument and display reverse of it.
23. Write a script to count total number of directories and files under the current directory.
24. Write Script to see current date, time, username, and current directory.
25. Write script to determine whether given file exist or not, for file name supplied as command line argument, also check for sufficient number of command line argument.
26. Write a script that accept weekday number from command line and display the name of the week day on terminal. If user pass wrong week number or any other wrong input then display appropriate error message on terminal.
27. Write a script to find sum and product of all digits of a number.
Enter an integer number :1234
SUM of all Digits is : 10
PRODUCT of all digits: 24
28. The basic salary of an employee is pass through command line. If the dearness allowance is 40% of basic salary and house rent allowance is 20% of basic salary. Write a script that calculate the gross salary of an employee.

Objective(s)	• Student shall be able to apply knowledge of commands to develop shell script. • Student shall understand use of different operators used in shell script. • Student shall understand use of different looping constructs. • Student shall understand use of commands inside shell script and file operations. • Student shall understand use of case and select loop constructs.
Pre-requisite	✓ Purpose and syntax of all commands as well as different shell script constructs. ✓ Purpose and syntax of different shell script constructs. ✓ Usage of commands inside shell script.
Duration for completion	15 hours
PEO(s) to be achieved	**PEO1**: To provide sound foundation in the fundamentals of computer application along with analytical, problem-solving, design and communication skill for life-long learning in chosen field. **PEO2**: To provide quality practical skill of tools and technologies to solve industry problems.

PO(s) to be achieved	**PO6**: Ability to use the techniques, skills and modern tools as necessary for software development.
Solution must contain	Program, output and description
Nature of submission	Handwritten
Reference for solving the problem	Book: i. Forouzan B. A., Gilberg R. R., UNIX and Shell Programming, Thomson ii. Das S., UNIX aoncepts and Applications, McGraw Hill
Post laboratory questions	1. What is shell script? 2. How will you take input from user in shell script? 3. What is the difference between using if statement for numeric and string values? 4. What are different types of file operators? 5. What are positional parameters? 6. What is the purpose of **shift** command? 7. What is the use of **$@** and **$*** parameters? 8. What is the use of **$#** and **$0** parameters?
Signature	

Practical No : 3	**Enrollment No:**

To perform following your directory must contains 15 to 20 different files with different names like data1, data2, data3, amstrong.sh, numsign.sh, triangle.sh, ladder.sh etc…

1. Write a command to list file names having 3 characters.
2. Write a command to list file names having 5 characters.
3. Write a command to list file names as given below(a word data followed by any digit):
   data1 data2 data3 ….
4. Write a command to list file names having .sh as extension.
5. Write a command to list file names start with alphabet s.
6. Write a command to list file names start with alphabet S or s.
7. Write a command to list five character file names start with any alphabet.
8. Write a command to list file names ends with digit.
9. Write a command to list file names start with .(dot/period).
10. Write a command to list file names ends with $.
11. Write a command to list three character file names having alphabets only.
12. Write a command to list file names having 2nd character digit.
13. Write a command to list file names end with two digits.
14. Write a command to list all file names in filelist.txt file.
15. Write a command to count total number of files in current directory.
16. Write a command to copy a file without using cp command.
17. Write a command to create a file using cat command.
18. Write a command to store output of ls –l command into a file data.list.

Objective(s)	Students will be able to understand the concept of Filtering utilities.
Pre-requisite	Concepts of redirection, piping & commands like head, tail, cut, paste, uniq, sort, tr etc.
Duration for completion	3 hours

PEO(s) to be achieved	**PEO1**: To provide sound foundation in the fundamentals of computer application along with analytical, problem-solving, design and communication skill for life-long learning in chosen field. **PEO2**: To provide quality practical skill of tools and technologies to solve industry problems.
PO(s) to be achieved	**PO6**: Ability to use the techniques, skills and modern tools as necessary for software development.
Solution must contain	Command, output and description
Nature of submission	Handwritten
Reference for solving the problem	Book: i. Forouzan B. A., Gilberg R. R., UNIX and Shell Programming, Thomson ii. Das S., UNIX aoncepts and Applications, McGraw Hill
Post laboratory questions	1. What is the purpose of **tr** command? 2. List out different options of **uniq** command. 3. List out different options with purpose of **sort** command. 4. What is the purpose of cut command? 5. List the options of cut command. 6. List three uses of cat commands. 7. State the difference between head and cut command. 8. State the difference between cat and paste command. 9. What is filter?
Signature:	

Practical No : 4	**Enrollment No:**

To perform following command create text files having text data, numeric data, alphanumeric data, empty lines, spaces and special characters.

1. Write a command to display a text file content on terminal.

2. Write a command to display file content in such a way that at the end of line $ sign appears. (use file having spaces at the end of some lines)

3. Write a command to display a file data if it exist. (If file not exist nothing will be displayed)

4. Write a command to count the number of lines, words and characters from the file.

5. Write a command to store line count of the file in the variable lines.

6. Write a command to store contents of file “ABC.txt” and “PQR.txt” into file “New.txt”.

7. Write a command to write contents of all file that name start with alphabet a into file output.txt.

8. Write a command to achieve following output from text file:

    a) Display first five characters.

    b) Display first 3 lines.

    c) Display last 15 characters.

    d) Display last 7 lines.

    e) Display lines from 6 to 10.

    f) Display last to 3rd line.

    g) Display only second line.

9. Write command to translate all capital characters into small characters and vice versa in file “ABC.txt”.

10. Sort long listing of current directory by “size” column in ascending order.

11. Lists the five largest files in the current directory.

12. Extract the name of only user from file /etc/passwd.

13. Write command to count total number of words from file without using wc command.

14. Write sort command to sort long listing of current directories firstly name wise and secondly their size wise using single sort command.

15. Write command to cut second and third fields from file PQR.txt vertically.

16. Write command to concatenate two file name ABC.txt and PQR.txt vertically.

17. Write command to merge two sorted file in single file.

18. Write command to add today's date and time to the end of a given file.

Objective(s)	Students will be able to understand the concept of Filtering utilities.
Pre-requisite	Concepts of redirection, piping & commands like head, tail, cut, paste, uniq, sort, tr etc.
Duration for completion	3 hours
PEO(s) to be achieved	**PEO1**: To provide sound foundation in the fundamentals of computer application along with analytical, problem-solving, design and communication skill for life-long learning in chosen field. **PEO2**: To provide quality practical skill of tools and technologies to solve industry problems.
PO(s) to be achieved	**PO6**: Ability to use the techniques, skills and modern tools as necessary for software development.
Solution must contain	Command, output and description
Nature of submission	Handwritten
Reference for solving the problem	Book: i. Forouzan B. A., Gilberg R. R., UNIX and Shell Programming, Thomson ii. Das S., UNIX aoncepts and Applications, McGraw Hill
Post laboratory questions	10. What is the purpose of **tr** command? 11. List out different options of **uniq** command. 12. List out different options with purpose of **sort** command. 13. What is the purpose of cut command? 14. List the options of cut command. 15. List three uses of cat commands. 16. State the difference between head and cut command. 17. State the difference between cat and paste command. 18. What is filter?
Signature:	

Practical No : 5	**Enrollment No:**
Practical Problems	1: Write a **chmod** command for following rwx triplets using symbolic code & octal code either for file or directory: 1. rwxrwxrwx 2. - - - - -rw- 3. r-xr-xr-x 4. -w- -w- -w- 5. r- -r- -r- - 6. -w---x-w- 7. -wx—xr- - 8. rw-rw-rw- 9. - - - - - - - - - 10. rwxrw-r - - 2: Perform following instruction and execute commands. 1. Write command to send your current process in background. 2. Write a command to bring lastly suspended job in foreground. 3. Write two different ways to terminate a job having ID 5. 4. What will be the effect of following command? $fg $fg %% 5. What will be the output of ps command? Describe all columns.

	6. What will be the output of **jobs** command? Give detailed of all columns.
Objective(s)	• Student shall understand use of **chmod** command for granting and revoking of permissions to files as well as directories using symbolic code and octal values for user, group & others. • Student shall understand concept of converting particular permission into rwx triplets for file. • Student shall understand use of **umask** command for setting default permissions for files as well as directories & convert it into rwx triplets. • Student shall understand use of Job Scheduling commands.
Pre-requisite	✓ Usage of **chmod** command and meaning of all set of permissions. ✓ Usage and concept of job scheduling commands.
Duration for completion	2 hours
PEO(s) to be achieved	**PEO1**: To provide sound foundation in the fundamentals of computer application along with analytical, problem-solving, design and communication skill for life-long learning in chosen field. **PEO2**: To provide quality practical skill of tools and technologies to solve industry problems.
PO(s) to be achieved	**PO6**: Ability to use the techniques, skills and modern tools as necessary for software development.
CO(s) to be achieved	**CO1**: Study of LINUX/UNIX environment and its need. **CO2**: Understand and use utilities to work with LINUX/UNIX environment.
Solution must contain	Command, output and interpretation
Nature of submission	Handwritten
Reference for solving the problem	Book: i. Forouzan B. A., Gilberg R. R., UNIX and Shell Programming, Thomson ii. Das S., UNIX aoncepts and Applications, McGraw Hill
Post laboratory questions	1. What is the syntax of **chmod** command? 2. List out different symbolic codes with their meaning. 3. List out different octal values with permissions. 4. List different users' categories. 5. What are the three levels of security in LINUX? 6. What permission is needed in directory to list the content of a directory? 7. What type of permission is needed to delete a file from a directory? 8. What is the syntax of **umask** command? 9. What is the difference between use of **chmod** & **umask** command for granting and revoking permissions? 10. What is foreground job? 11. What is background job? 12. What is the meaning of "+"(plus) and "-(minus)" sign in output of "jobs" command? 13. What are the six different states of job?
Signature:	