

POKHARA UNIVERSITY

Level: Masters
Program: MECE/MscCS/MCIS
Course: Unix Shell Programming

Semester : Fall

Year :2016
Full Marks :100
Time :4 hrs

*Candidates are required to give answers in their own words as far as practicable.
The figures in the right margin indicate full marks.*

Attempt ALL questions.

- 1 (a) Explain meanings of the output messages generated by the given Unix/Linux commands : - 5 From Unit 1

	Commands entered	Outputs displayed
(i)	uname; hostname; whoami	FreeBSD roshanX roshanchi
(ii)	users wc -w	2
(iii)	w sort >out &	[1] 985 986
(iv)	type type	type is a shell builtin
(v)	time ls sort > dirlist	real 0m0.002s user 0m0.000s sys 0m0.000s

- (b) Given the following files in your current directory: 5 From Unit 1

ASCII.txt	genascii.sh	MTX1	mtx2.txt	seed.txt	x2
ascript	intro	mtx1.txt	pb.sh	sum.sh	xm1
intro2	mkmtx.sh	MTX2	phonebook	x1	xm2

what would be the output from the following commands?

- (i) echo *[^0-9]
- (ii) echo m[ktT]*
- (iii) echo *[aAsScC]*
- (iv) echo *.*
- (v) echo ???[0-9]*

- 2 (a) Describe shell's responsibilities in Unix/Linux. 5 From Unit 2
- (b) Consider the following address book as displayed by the command `sed -n l phonebook`: - 10 From Unit 2

Tony\t55-23 Vine Street, Miami\t(307) 555-5356
 Emanuel\t39 University Place, New York\t(212) 555-3456
 Lucy\t17 E. 25th Street, New York\t(212) 555-9959
 Ralph\t38 Chauncey St., Bensonhurst\t(212) 555-7741
 Fred\t17 E. 25th Street, New York\t(212) 555-0040

Now, explain what happens when the following commands are entered :-

- (i) cut -f1 phonebook >names; cut -f2 phonebook >addresses; cut -f3 phonebook >phones
- (ii) paste -d'+' names phones
- (iii) cat addresses | grep -i "street"
- (iv) sed '/Man/d
 > /Tony/s//\'Tony Tucker\'/
 > /Fred/s//Fredericks/' phonebook > newphbook
- (v) ed newphbook
 1,\$s/\$/<<new>>/g

- 3 (a) Explain environment variables and shell variables with suitable examples in context of Bash shell. 5 From Unit 3
- (b) Given the shell programs to the right column, answer the questions in the left column. 10 From Unit 3

(i)	Rewrite the program by replacing the string Hello and the command whoami with variables.	#!/bin/sh # hiyou echo "Hello, `whoami`!" exit 0
(ii)	Write down the output of the program that is executed by the command args a b c d e	#!/bin/sh # args echo \$# \$* shift; echo \$# \$* shift; echo \$# \$* shift; echo \$# \$* shift; echo \$# \$* shift; echo \$# \$*
(iii)	Make necessary correction in the program to get the product of 17 and 6 as the output.	#!/bin/sh # prod2nums a = 17; b=6 i = expr "a * b" echo i
(iv)	Edit the piece of the program to display the output <<< echo	x=1 echo <<< echo \$x >>> displays

	<i>\$x >>> displays the value of x, which is 1</i>	the value of x, which is \$x	
(v)	Explain the difference between these two program codes.	var=12345 let var=\$var+1 echo \$var	v=12345 v=\$v+1 echo \$v

- 4 (a) “Whenever any program completes execution, it returns an exit status back to the system.” Verify with an appropriate illustration. 5
- (b) In the following bash shell scripts, some of the keywords and expressions have been replaced with simple English pseudo-codes. Now, create a correct and working shell script by restoring all those pseudo-codes with appropriate shell script codes. (**Attempt either program 1 or program 2 only**) 10

```
#!/bin/bash
# program 1 : testleap.sh - tests if the current year is a leap year.
year=year portion of date
if [ [$year divided by 400] equals zero ]; then
    print "This is a leap year. February has 29 days."
else if [ [$year divided by 4] equals 0 ]; then
    if [ [$year divided by 100] not equal to 0 ]; then
        print "This is a leap year, February has 29 days."
    else
        print "This is not a leap year. February has 28 days."
    end if
else
    print "This is not a leap year. February has 28 days."
end
```

OR

```
#!/bin/bash
#program 2 : greetings - Program to print a greeting
#
hour=hour part of date
case hour
where
    Between 00 to 11 am ) print "Good morning";;
    From noon to 17 o clock ) print "Good afternoon";;
    otherwise ) print "Good evening";;
end case
```

- 5 (a) Carefully examine the shell script given below.

10

```
#!/bin/bash
# Calculate the average of a series of numbers.
SCORE="0"; AVERAGE="0"; SUM="0"; NUM="0"
while true; do
    echo -n "Enter your score [0-100%] ('q' for quit): "
    read SCORE;
    if (("SCORE" < "0")) || (("SCORE" > "100")); then
        echo "Be serious. C'mon, try again: "
    elif [ "$SCORE" == "q" ]; then
        echo "Average rating: $AVERAGE%."
        break
    else
        SUM=$((SUM + SCORE))
        NUM=$((NUM + 1))
        AVERAGE=$((SUM / NUM))
    fi
done
```

Now,

- (i) Change the **while** loop into **for** loop that accepts 10 numbers only.
Also modify corresponding codes, remove unnecessary ones or add new, if required.
- (ii) Replace logical OR (||) with logical AND (&&) and make necessary changes to retain the same logic.

- (b) Read the following shell program and follow the instructions at the end of this question.

5

```
#!/bin/sh
# adder
sum=0
for x in $@
do
    sum=`expr $sum + $x`
done
echo "The sum is $sum."
exit 0
```

Instructions: -

- (i) Change the **for** loop into any other loop and also make required changes at any part of the program.
- (ii) Make the program accept values of **x** from the user instead of supplying them as arguments.
- (iii) Also calculate and print the average value of all input values.

6	(a)	Explain the differences between <i>echo</i> and <i>printf</i> commands.	5	
	(b)	What are the outputs of the following commands? (i) <code>printf "Word1 : %s and Word 2 : %c\n" hello Hello</code> (ii) <code>printf "Number 1 is %d and Number 2 is %o\n" 20 20</code> (iii) <code>printf "%+d\n%+d\n" 10 -10</code> (iv) <code>printf ":%-6.5s:\n" abcdefg</code> (v) <code>printf "%*s%*.*s\n" 10 "test one" 10 2 "test two"</code>	10	
7		Write short notes on	15	
	(a)	Interactive and non- interactive shells		From Unit 2
	(b)	Arithmetic expansion		From Unit 3
	(c)	break and continue in loops		From Unit 5

Marks distribution: -

Unit	Credit Hour	Question	Marks	Total
1	6	1 (a), 1 (b)	5, 5	10
2	9	2 (a), 2 (b), 7 (a)	5, 10, 5	20
3	9	3 (a), 3 (b), 7 (b)	5, 10, 5	20
4	6	4 (a), 4 (b)	5, 10	15
5	9	5 (a), 5 (b), 7 (c)	5, 10, 5	20
6	6	6 (a), 6 (b)	5, 10	15
		Total		100

This question set has not been used anywhere else and neither will be used for any other purpose.

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