PRINT Name: _____ **LAB Section:** ☐☐☐

Test Version: _____   **One-Answer Multiple Choice**   **50 Questions – 10 of 10%**

☞ Read **all** the words of these instructions and **both** sides (back and front) of all pages.
☞ Use your full, unabbreviated name on the mark-sense form. Do not abbreviate your name.
☞ Put the three-digit **Test Version** above into **NO. OF QUESTIONS** and **NO. OF STUDENTS**
☞ Fill in the bubbles with pencil only, no pen. Enter your NAME, Test Version, and answers.
☞ Manage your time. Answer questions you know, first. One Answer per question.

1. *[28/116]* What would be the output of the following command line:
   ```
   echo a b c | awk '{print NF}'
   ```
   a. `a b c`   *b.* `no output`   *c.* `c`
   d. `NF`   *e.* `3`

2. *[34/116]* Which of the following options for **bash** or **sh** might be useful for debugging a shell script?
   a. `-r`   *b.* `-z`   *c.* `-c`   *d.* `-x`   *e.* `-l`

3. *[44/116]* What is the output of this sequence of three shell commands:
   ```
   umask 527 ; touch newfile ; ls -l newfile
   ```
   a. `--w-r-x--- 1 me me 0 Oct 1 1:12 newfile`
   b. `--w-r----- 1 me me 0 Oct 1 1:12 newfile`
   c. `-rwxrw---x 1 me me 0 Oct 1 1:12 newfile`
   d. `-rw-rw---- 1 me me 0 Oct 1 1:12 newfile`
   e. `-r-x-w-rwx 1 me me 0 Oct 1 1:12 newfile`

4. *[48/115]* If **foo** is a script containing the line **TERM=new ; export TERM**, what is the output of the following sequence of **bash** commands that use **foo**:
   ```
   TERM=bar ; ./foo ; echo '$TERM'
   ```
   a. `TERM`   *b.* `new`   *c.* `$TERM`   *d.* `bar`   *e.* `foo`

5. *[52/116]* If **./a/b** were a readable empty file, what would be the **bash** shell output of this two command sequence:
   ```
   PATH=/etc/:/usr:/var ; /bin/cat ./a/b
   ```
   a. `/bin/cat: ./a/b: No such file or directory`
   b. `bash: cat: command not found`
   c. no output
   d. `bash: /bin/cat: command not found`
   e. `bash: ls: command not found`

6. *[55/116]* What is the output on your screen of the following sequence of commands: **i=00 ; [$i -eq 0] ; echo $?**
   a. the number 0 or 1 followed by another 0 or 1 on a new line
   b. `0`
   c. no output
   d. `test: $i: integer expression expected`
   e. `1`

7. *[55/115]* If the current directory contains files **abc**, **bbc**, **cbc**, and **bbc** contains just the line **dbd**, what is the output of the following command:
   ```
   grep 'b*$' bbc
   ```
   a. `cbc`   *b.* no output   *c.* an error message
   d. `dbd`   *e.* `bbc`

8. *[56/115]* If **exfor** is an executable script containing the line **for myvar;do echo -n "$myvar ";done**, what is the output of the script
   ```
   ./exfor one two three
   ```
   a. `one two three`   *b.* `no output`   *c.* `three`
   d. `two three`   *e.* `one`

9. *[57/116]* Which command will help you track how many subshells deep your current shell is?
   a. `shlvl`   *b.* `echo "$SHLVL"`   *c.* `runlevel`
   d. `sh`   *e.* `bash`

10. *[64/116]* If **a=3** and **b=4** then what is the output on your screen of the following sequence of commands: **["$a" -eq 3 -o "$b" -eq 3]; echo "$?"**
    a. `number 1 or 0 followed by 1 or 0 on a new line`
    b. `0`
    c. `[: $a: string expression expected`
    d. `1`
    e. `no output`

11. *[65/116]* If **dog** is an executable script containing the line: **umask 0077** what is the output of the following sequence of commands:
    ```
    umask 0022 ;source dog ; umask
    ```
    a. `0075`   *b.* no output on screen   *c.* `0077`
    d. `0022`   *e.* `0079`

12. *[68/116]* What is the output on your screen of the following sequence of commands: **x=pig ; y=cow ; [-z $x] ; echo $?**
    a. the number 0 or 1 followed by another 0 or 1 on a new line
    b. `test: $x: integer expression expected`
    c. `0`
    d. `1`
    e. no output

13. *[68/116]* If the file **foo** in the current directory contains just two lines **dbd**, and **123**, what is the output of the following command:
    grep '[[:alnum:]]' foo
    a. **foo**   *b.* no output or an error message
    c. **123**   *d.* both lines
    e. **dbd**

14. *[69/116]* Who is the owner of file **bar** after you successfully execute this sequence of commands in your home directory:
    touch foo ; ln foo one ; ln one two ; ln two bar
    a. you own the file **bar**
    b. the file is owned by **home**
    c. the file is owned by **passwd**
    d. the file is owned by **root**
    e. you cannot execute the given commands; no file will be created

15. *[71/116]* What is the output on your screen of the following command sequence:
    i=04; test $i = 4 ; echo $?
    a. **0**
    b. no output
    c. **1**
    d. the number 0 or 1 followed by another 0 or 1 on a new line
    e. **test: $i: integer expression expected**

16. *[71/116]* If the file **foo** in the current directory contains just the line **abc123**, what is the output of the following command: **grep '^[[:alpha:]]' foo**
    a. an error message   *b.* no output   *c.* **abc123**
    d. **123**   *e.* **abc**

17. *[72/116]* What is the correct syntax to redirect both standard output and standard error into the same output file?
    a. **command 2>out >out**   *b.* **command 2>1 >out**
    c. **command >out 2>1**   *d.* **command >out 2>&1**
    e. **command 2>&1 >out**

18. *[72/115]* If there is a file **foo** in the current directory contains just the line **abcd**, what is the output of the following command:
    [-e foo] && rm foo; cat foo
    a. **cat: foo: No such file or directory**
    b. **0**
    c. no output
    d. **foo**
    e. **abcd**

19. *[73/116]* What is true about this output from **ls -il foo bar**
    24 -rwxr----- 3 root root 2 Jul 31 12:33 foo
    24 -rwxr----- 3 root root 2 Jul 31 12:33 bar
    a. **foo** and **bar** are names for different files
    b. **foo** and **bar** are two of three names for this file
    c. **foo** and **bar** are names for the same file
    d. this output is not possible
    e. **foo** and **bar** each have two names (four names total)

20. *[74/116]* If **a=123** and **b=456** then what is the output of the following sequence of **bash** commands: **if [$a = $b]; then echo $a ; fi**
    a. **bash: 123: command not found**
    b. **123**
    c. no output
    d. **test: $a: string expression expected**
    e. **test: a=123: integer expression expected**

21. *[75/116]* If the current directory contains files **abc**, **bbc**, **cbc**, and **bbc** contains just the line **bbb**, what is the output of the following command: **grep bb* bbc**
    a. **bbc**   *b.* no output   *c.* **cbc**
    d. **dbd**   *e.* an error message

22. *[75/116]* If the current directory contains files **abc**, **bbc**, **cbc**, and **bbc** contains just the line **dbd**, what is the output of the following command:
    grep "^bb*" bbc
    a. **dbd**   *b.* **cbc**   *c.* no output
    d. **bbc**   *e.* an error message

23. *[76/116]* Which line below puts the count of the number of lines in the password file into the variable **foo**?
    a. **foo=$(wc -l </etc/passwd)**
    b. **foo=$(cat -c /etc/passwd)**
    c. **foo=$(wc /etc/passwd | awk echo $1)**
    d. **foo=$(awk -F: /etc/passwd | wc -l)**
    e. **foo=$(wc -l /etc/passwd | awk "print $1")**

24. *[78/115]* If **bar** is an executable script containing the line **animal=dog** then what is the **bash** output of this sequence of three commands:
    animal=pig ; ./bar ; echo "the '$animal' ate"
    a. **the 'pig' ate**   *b.* **the '$cow' ate**
    c. **the 'dog' ate**   *d.* **the 'cow' ate**
    e. **the $cow ate**

25. *[79/116]* What is the output of this successful command line?
    cd /home/myhome ; mkdir foo ; mkdir bar ; cd
    a. **/home/myhome/foo**   *b.* no output
    c. **/home/myhome**   *d.* **/bar**
    e. **/home/myhome/bar**

26. *[80/116]* Which of these statements is true?
   a. Typing **./script** and **bash script** always give identical results.
   b. The **ls dir** command looks up the directory argument **dir** in your **$PATH**.
   c. If **./q** is an empty directory, **echo ./q/.*** produces an error message.
   d. Double quotes will stop shell glob (wildcard) patterns from expanding.
   e. If **./p** is an empty directory, **ls ./p/.*** produces an error message.

27. *[83/116]* In an empty directory, what appears on your screen after this **bash** command line?   **ls 1>/dev/null nosuchfile**
   a. **ls: nosuchfile: No such file or directory**
   b. **ls: 1>/dev/null nosuchfile: No such file or directory**
   c. **nosuchfile**
   d. **ls: /dev/null: No such file or directory**
   e. no output

28. *[84/115]* What is the output on your screen of the following sequence of commands: **a=4 ; b=4 ; [$a -le $b] ; echo $?**
   a. **1**
   b. **0**
   c. **test: $a: integer expression expected**
   d. no output
   e. the number 1 or 0 followed by another 1 or 0 on a new line

29. *[85/115]* Given the following **bash** shell command line:
       read xx yy zz
   which user keyboard input line below will assign the text **22** to the shell variable named **zz**?
   a. **11 33 22**   *b.* **xx=11 zz=22 yy=33**
   c. **22 33 11**   *d.* **11 22 33**
   e. **11;22;33**

30. *[86/116]* A shell script named **bar** is executed as follows:
       ./bar "a b" "c d e" f
   Inside the script is the line: **echo "$3"**
   What is the output on your screen from this line?
   a. **$3**   *b.* **f**   *c.* **"f"**   *d.* **c d e**   *e.* **a b**

31. *[87/116]* Which of the following regular expressions would match lines that contain no white space?
   a. **[^:space:]***   *b.* **[^[:space:]]*$**
   c. **^[^[:space:]]*$**   *d.* **[^[:space:]]***
   e. **^[[:space:]]*$**

32. *[94/115]* Which of these command lines will make file **cow** contain all of the content of file **one** followed by all of the content of file **two**?
   a. **cat one two >cow**   *b.* **mv one two >cow**
   c. **cp one two >cow**   *d.* **echo one two >cow**
   e. **cp one >cow two >cow**

33. *[96/114]* Which **bash** command sequence correctly compares the two numbers and prints **OK**?
   a. **if (! 4 < 3) ; then echo OK ; fi**
   b. **if [4 -ge 3] ; then echo OK ; fi**
   c. **if [! 4 -gt 3] ; then echo OK ; fi**
   d. **if [4 > 3] ; then echo OK ; fi**
   e. **if (3 < 4) ; then echo OK ; fi**

34. *[97/116]* What minimal permissions must you have on a directory to be able to execute successfully the command **ls .** from *inside* the directory?
   a. **r--**   *b.* **--x**   *c.* **-wx**   *d.* **r-x**   *e.* **rw-**

35. *[97/116]* Which of these commands makes a file owned by me, also writable by me?
   a. **umask 777 myfile**   *b.* **chmod x=u ./myfile**
   c. **chmod u+w myfile**   *d.* **chmod u+x ./myfile**
   e. **umask 111 myfile**

36. *[97/116]* Which of these statements is true?
   a. To make a hard link to file "**foo**" named "**bar**", file "**foo**" must exist.
   b. You can make a hard link to a directory.
   c. You only need "**r--**" permission on directory "**foo**" for "**ls -l foo**" to work.
   d. If you give me write permission on a file owned by you, I can then use **chmod** to change its permissions.
   e. The "**ln**" command takes two arguments, so the maximum number of hard links a file can have is two.

37. *[98/116]* If **/etc/passwd** is a file name, which of the following pathnames always leads to the same file?
   a. **/etc/passwd/../..**   *b.* **/etc/../../passwd**
   c. **/etc/passwd/.**   *d.* **./etc/passwd**
   e. **/etc/../etc/passwd**

38. *[98/116]* What is the output of the following sequence of **bash** commands:
       a=1 ; b=2 ; test $a -ge $b ; echo $?
   a. **1**
   b. **0**
   c. the number 1 or 0 followed by another 1 or 0 on a new line
   d. no output
   e. **test: $a: integer expression expected**

39. *[99/115]* Which of the following regular expressions would match lines that contain one or more alphanumeric characters only?
   a. **^[[:alnum:]]*$**
   b. **[[:alnum:]][[:alnum:]]***
   c. **[a-z0-9][a-z0-9]***
   d. **[[:alnum:]]***
   e. **^[[:alnum:]][[:alnum:]]*$**

40. *[100/115]* What is in file **myfile** after running this **bash** shell command line?
    ```
    echo one > myfile two three
    ```
    a. **echo two three**   *b.* **one two three**
    c. no output (empty file)   *d.* **two myfile three**
    e. **three**

41. *[102/116]* Which command sequence creates a directory into which anyone can put a file, but in which nobody can see the names of the files that are there?
    a. **mkdir protected ; cd protected ; chmod go+wx .**
    b. **mkdir protected ; chmod 777 protected**
    c. **mkdir protected ; cd protected ; chmod go-x .**
    d. **mkdir protected ; chmod 777 .**
    e. **mkdir protected ; chmod 333 protected**

42. *[102/116]* If the file **foo** in the current directory contains just the line **dbd**, what is the output of the following command: **grep '[[:alpha:]]' foo**
    a. **123**   *b.* **dbd**   *c.* an error message
    d. no output   *e.* **foo**

43. *[103/116]* Which line does **not** match the following extended Regex?
    ```
    grep -E '[pP][aA][sS]{2}w[d|ord]$'
    ```
    a. **passwd**   *b.* **pAsSwd**   *c.* **password**
    d. **PASSword**   *e.* **passwD**

44. *[103/115]* Which command below removes *only* this five-character file name containing a special character (and no others): ***test**
    a. **rm '*test'**   *b.* **rm *test**   *c.* **rm ./*test**
    d. **rm ./*test**   *e.* **rm *test**

45. *[104/116]* If **cow** is a sub-directory that contains only the file **dog**, what happens after this command: **mv cow/./../dog cow/cat**
    a. there is a second copy of the file **dog** in the file named **cat**
    b. the command fails because the name **cow/./../dog** does not exist
    c. the directory **cow** now contains only a file named **cat**
    d. the directory **cow** is now empty
    e. the command fails because the name **cat** does not exist

46. *[106/115]* Which of the following is true, given this long directory listing from **ls**:
    ```
    755 drwxr-x--x 256 wen user 1024 May 30 12:35 dir
    ```
    a. The number 256 is the octal permissions of this directory.
    b. The number 256 is the inode number of this directory.
    c. The number 755 is the count of links (names) this directory has.
    d. The number 1024 is the size of this directory.
    e. The number 1024 is the count of links (names) this directory has.

47. *[107/116]* In the output of the command **ls -a**, a dot that begins a name signifies what?
    a. The current directory.
    b. A name that is hidden.
    c. A current file.
    d. The parent directory.
    e. A name with an unprintable character.

48. *[107/115]* What is the result of this exact command line:
    ```
    echo /etc/passwd ls
    ```
    a. file "/etc/passwd" will be copied to "hello"; the names will be displayed as well
    b. the text "/etc/passwd" and "ls" will be displayed
    c. the contents of the files "/etc/passwd" and "hello" will be displayed
    d. all the files under "/etc/passwd" with the name "hello" will be displayed
    e. a list of file names matching "/etc/passwd" and "hello" will be displayed

49. *[110/116]* What would you type to change the permissions on a file to **rwxr-xr--**?
    a. **chmod 754 file**   *b.* **chmod 244 file**
    c. **chmod 311 file**   *d.* **chmod 744 file**
    e. **chmod 211 file**

50. *[110/116]* Which command line would show the inode number of a file?
    a. **cat -ia file**   *b.* **cat -la file**   *c.* **ls -la file**
    d. **ps -la file**   *e.* **ls -ia file**