

PRINT Name: _____ LAB Section:

Test Version: 461 One-Answer Multiple Choice 204 Questions – 15 of 15%

- ⇒ 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 both **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.
- ⇒ The answer to the questions below about reading/doing all these test instructions is: **Jes**

1. **Did you read all the words of the test instructions on page one?**
 - a. **Taip** (Yes - Lithuanian)
 - b. **Sim** (Yes - Portuguese)
 - c. **Jes** (Yes - Esperanto)
 - d. **Igen** (Yes - Hungarian)
 - e. **Tak** (Yes - Polish)
2. **My three-digit Lab Section number is:**
 - a. My lab room number, e.g. T303, T230, P305, T321
 - b. My lecture room number, e.g. T119
 - c. The timetable section number of my weekly 2-hour lab period.
 - d. My lecture section number, e.g. 010 or 020.
 - e. The Test Version number printed in the top left corner.
3. If **/bin/bat** is a program that outputs **foo** and **/usr/bin/bat** is a program that outputs **hi** what would be the output on your screen of this two command sequence: **PATH=/usr:/usr/bin:/bin ; bat**
 - a. **bash: bat: command not found**
 - b. **foo**
 - c. **hi** followed by **foo**
 - d. **foo** followed by **hi**
 - e. **hi**
4. If your terminal type is **xterm**, what is the output of this command line?
echo '\$TERM'
 - a. **xterm**
 - b. no output on screen
 - c. **'\$TERM'**
 - d. **'xterm'**
 - e. **\$TERM**
5. How many arguments are passed to the command by the shell:
<bar bar -b"-a '-r' >bar" bar >out
 - a. 2
 - b. 6
 - c. 3
 - d. 5
 - e. 4
6. What is in file **c** after this command line:
echo A >a ; ln a b ; echo B >b ; ln a c ; rm a b
 - a. **A** followed by **B**
 - b. no such file (nonexistent)
 - c. **A**
 - d. **B**
 - e. nothing (empty file)

7. What is the output on your screen after this command line:
echo hi >out | wc -l
 - a. no output
 - b. 0
 - c. 2
 - d. 3
 - e. 1
8. How do you execute the program **foo** in the current directory?
 - a. **foo/**
 - b. **\$HOME/foo**
 - c. **/foo**
 - d. **foo/.**
 - e. **./foo**
9. If I have a directory named **a/b**, which action would increase its *link count* by exactly one?
 - a. create a directory named **a/b/c**
 - b. create a hard link to directory **b** named **b2**
 - c. create a file named **a/b2**
 - d. create a file named **a/b/c**
 - e. create a directory named **a/b2**
10. How many arguments are passed to the command by the shell:
<foo foo " a 'b c' d " e ' f " g " ' >foo h
 - a. 4
 - b. 6
 - c. 5
 - d. 2
 - e. 3
11. If **/bin/pig** is a program that outputs **hi** and **/usr/bin/pig** is a program that outputs **foo** what would be the output on your screen of this two command sequence: **PATH=/etc:/usr/bin:/bin ; pig**
 - a. **bash: pig: command not found**
 - b. **foo**
 - c. **foo** followed by **hi**
 - d. **hi**
 - e. **hi** followed by **foo**
12. If you are in **/bin** and **ls -l** shows a symbolic link **foo -> dir/bar** then dereference the absolute path of **foo** with no symbolic links:
 - a. **/bin/dir/bar/foo**
 - b. **/dir/bar**
 - c. **/bin/dir/bar**
 - d. **/bin/foo/dir/bar**
 - e. **/foo/dir/bar**
13. What is the output on your screen after this two command sequence:
PATH=/bin/cat:/bin/sh:/bin/ls ; ls nosuchfile
 - a. **ls: nosuchfile: No such file or directory**
 - b. **bash: /bin/ls: command not found**
 - c. **bash: /bin/sh: No such file or directory**
 - d. **bash: ls: command not found**
 - e. **ls: /bin/ls: command not found**
14. Which command line always prints just the two characters **\$x** on the screen?
 - a. **echo "\$\$x"**
 - b. **echo "\$x"**
 - c. **echo \$\$x**
 - d. **echo '\$x'**
 - e. **echo \$x**

15. If `/bin/foo` is a program that outputs `dad` and `/usr/bin/foo` is a program that outputs `mom` what would be the output on your screen of this two command sequence: `PATH=/usr:/etc:/bin:/usr/bin ; foo`
- `mom` followed by `dad`
 - `mom`
 - `dad` followed by `mom`
 - `dad`
 - `bash: foo: command not found`
16. What is in file `c` after this command line:
`echo B >b ; ln b a ; echo A >a ; ln a c ; rm a b`
- no such file (nonexistent)
 - nothing (empty file)
 - `B`
 - `A` followed by `B`
 - `A`
17. If `/bin/foo` is a program that outputs `hi` and `/usr/bin/foo` is a program that outputs `mom` what would be the output on your screen of this two command sequence: `PATH=/etc:/usr/bin:/bin ; foo`
- `bash: foo: command not found`
 - `mom` followed by `hi`
 - `mom`
 - `hi`
 - `hi` followed by `mom`
18. What is the link count of file `f` after these successful commands?
`rm f ; touch f ; ln f b ; cp f g
cp b a ; ln a d ; ln b c ; cp c g`
- 1
 - 5
 - 3
 - 2
 - 4
19. What is the link count of file `foo` after these successful commands?
`rm foo ; touch foo ; ln foo bar
cp bar x ; ln x y ; ln bar z`
- 1
 - 4
 - 3
 - 5
 - 2
20. What command will recursively show disk usage in directories?
- `find`
 - `ls`
 - `du`
 - `tree`
 - `df`
21. What is the output on your screen of this unquoted command line:
`mkdir a ; touch b a/b1 a/b2 ; find a -name b*`
- no output
 - `b a/b1 a/b2`
 - `b1 b2`
 - `b`
 - `a/b1 a/b2`
22. How many arguments are passed to the command by the shell:
`<cow cow "-x" -y '-z' >cow cow`
- 3
 - 4
 - 2
 - 6
 - 5

23. What is the output on your screen after these command lines:
`echo one >x ; ln x y ; echo two >>y
sort x >y ; cat y`
- `two`
 - `one`
 - no output
 - `two` followed by `one`
 - `one` followed by `two`
24. What displays on your screen given this command:
`date >date ; pwd >pwd ; head date | tail pwd`
- nothing displays because `tail` ignores the pipe
 - only the `pwd` displays because `tail` ignores the pipe
 - `head` displays the `date` and `tail` displays the `pwd`
 - `tail` reads the pipe and the `pwd` and displays both together
 - only the `date` displays because `tail` ignores the pipe
25. What is the output on your screen after this command line:
`echo hi >a ; cp a b | wc -c`
- 1
 - 3
 - no output
 - 0
 - 2
26. How many files are touched or created? `touch '1 "2 3 '4' " '5`
- 3
 - 4
 - 5
 - 1
 - 2
27. What is the link count of directory `dir` after these successful commands?
`mkdir dir ; cd dir ; touch one ; mkdir two`
- 5
 - 1
 - 3
 - 4
 - 2
28. Given this `ls -il` long listing:
`123 drwxr-xr-x 456 me me 789 Jan 1 1:00 dir`
How many subdirectories lie immediately under `dir`?
- 787
 - 456
 - 789
 - 123
 - 454
29. What is the link count of file `f` after these successful commands?
`rm f ; touch f ; cp f x
ln f a ; ln x y ; ln a z ; ln x b`
- 4
 - 5
 - 2
 - 3
 - 6
30. What is the link count of directory `a` after these successful commands?
`mkdir a ; mkdir a/b ; mkdir a/c ; mkdir a/b/c`
- 5
 - 3
 - 2
 - 4
 - 1
31. Which of the following is true, given this long directory listing:
`drwxr-x--x 128 me me 32 Jan 1 1:00 dir`
- The number 32 is the inode number of this directory.
 - The number 128 is the inode number of this directory.
 - The number 32 is the count of links (names) this directory has.
 - The number 128 is the size of this directory.
 - The number 32 is the size of this directory.

32. In an empty directory, what is the output on your screen after this command line:
`echo hi >a ; ls | wc -w`
 a. 1 b. no output c. 2
 d. a e. 0
33. If the file `bat` contained the word `foo`, what would be the output on your screen of this two command sequence:
`PATH=/etc/passwd:/bin/ls:/bin/cat ; /bin/ls bat`
 a. no output on screen
 b. `bat`
 c. `foo`
 d. `/bin/ls: bat: No such file or directory`
 e. `bash: /bin/ls: command not found`
34. If files occupy one disk block, how many disk blocks will the system free up if I remove these four file names:
`111 -rw-r--r-- 2 me me 100 Jan 1 1:00 a`
`222 -rw-r--r-- 1 me me 100 Jan 1 1:00 b`
`333 -rw-r--r-- 2 me me 100 Jan 1 1:00 c`
`333 -rw-r--r-- 2 me me 100 Jan 1 1:00 d`
 a. 3 b. 4 c. 0 d. 2 e. 1
35. How many arguments are passed to the command by the shell:
`<foo foo " a 'b c' d " e ' f " g " ' >foo`
 a. 4 b. 5 c. 3 d. 6 e. 2
36. What is the link count of directory `dir` after these successful commands?
`mkdir dir ; touch foo ; cd dir ; ln ../foo bar`
 a. 1 b. 5 c. 2 d. 4 e. 3
37. How many arguments are passed to the command by the shell:
`echo "cow "y " bat 'man x' " pig'a "hop' a b`
 a. 11 b. 4 c. 7 d. 5 e. 6
38. If files occupy one disk block, how many disk blocks will the system free up if I remove these four file names:
`111 -rw-r--r-- 2 me me 1 Jan 1 1:00 a`
`111 -rw-r--r-- 2 me me 1 Jan 1 1:00 b`
`222 -rw-r--r-- 3 me me 1 Jan 1 1:00 c`
`222 -rw-r--r-- 3 me me 1 Jan 1 1:00 d`
 a. 1 b. 2 c. 4 d. 0 e. 3
39. If files occupy one disk block, how many disk blocks will the system free up if I remove these four file names:
`111 -rw-r--r-- 2 me me 100 Jan 1 1:00 a`
`111 -rw-r--r-- 2 me me 100 Jan 1 1:00 b`
`222 -rw-r--r-- 3 me me 100 Jan 1 1:00 c`
`222 -rw-r--r-- 3 me me 100 Jan 1 1:00 d`
 a. 1 b. 4 c. 0 d. 3 e. 2

40. How many arguments are passed to the command by the shell:
`echo 'It's a bird! No! It's a plane!'`
 a. 2 b. 1 c. 5 d. 4 e. 3
41. If `/bin/prg` is a program that outputs `hi` and `/usr/bin/prg` is a program that outputs `foo` what would be the output on your screen of this two command sequence: `PATH=/etc:/usr/bin:/bin ; prg`
 a. `hi`
 b. `hi` followed by `foo`
 c. `bash: prg: command not found`
 d. `foo`
 e. `foo` followed by `hi`
42. You enter this `cp a/b c/` and get `cp: a: No such file or directory` because:
 a. directory `c` does not exist
 b. the command `cp` is not in your search PATH
 c. pathname `a` exists but is a file, not a directory
 d. you forgot to specify the destination file name after `c/`
 e. directory `a` does not exist
43. Which command line makes pathnames `/usr/local/bin` and `/usr/bin` lead to the same directory?
 a. `ln . /usr/local` b. `touch /usr/local`
 c. `rmdir /usr/local` d. `mkdir /usr/local`
 e. `ln -s . /usr/local`
44. If you are in `/bin` and `ls -l` shows a symbolic link `bar -> ../dir/foo` then dereference the absolute path of `bar` with no symbolic links:
 a. `/bin/dir/foo` b. `/dir/foo`
 c. `/bin/bar/dir/foo` d. `/bin/dir/foo/bar`
 e. `/bar/..dir/foo`
45. What is usually in the environment variable `$HOME`?
 a. the relative path of the system `/home` directory
 b. the relative path of your login home directory
 c. the relative path of the ROOT directory
 d. the absolute path of your login home directory
 e. the absolute path of the system `/home` directory
46. The correct syntax to assign to a shell variable is:
 a. `V = foo bar` b. `V="foo bar"`
 c. `V = "foo bar"` d. `"V=foo bar"`
 e. `V=foo bar`
47. How many arguments are passed to the command by the shell:
`<bar bar -b "-a" '-r' >bar bar bar`
 a. 3 b. 7 c. 4 d. 5 e. 6

48. File **a** contains 2 lines. File **b** contains 3 lines. How many lines are in file **d** (not in **c**) after this command line:
`ln a d ; ln d c ; ln c e ; cat a a b b c c d d e e >c`
 a. 2 b. 10 c. 18 d. 21 e. 6
49. What is the link count of file **f** after these successful commands?
`cp f x ; ln f a ; ln x y ; ln a z ; ln a b`
 a. 6 b. 2 c. 3 d. 4 e. 5
50. If files occupy one disk block, how many disk blocks will the system free up if I remove these four file names:

```
111 -rw-r--r-- 1 me me 100 Jan 1 1:00 a
222 -rw-r--r-- 1 me me 100 Jan 1 1:00 b
333 -rw-r--r-- 1 me me 100 Jan 1 1:00 c
444 -rw-r--r-- 1 me me 100 Jan 1 1:00 d
```

 a. 4 b. 1 c. 0 d. 3 e. 2
51. What is the output of this command line if run in an empty directory:
`touch A a ; echo * ">*"`
 a. A a >A a b. * >* c. A a
 d. No output e. A a >*
52. What is the link count of directory **d** after these successful commands?
`mkdir d ; cd d ; touch f ; ln f a ; ln f b`
 a. 4 b. 3 c. 1 d. 5 e. 2
53. How many files are touched or created?
`touch 1 "2 3" ' ' 4 5`
 a. 6 b. 7 c. 4 d. 5 e. 3
54. If I have a directory named **/1/2**, which action would increase its *link count* by exactly one?
 a. create a directory named **/1/2**
 b. create one file named **/1/2/3**
 c. create a directory named **/1/22**
 d. create one file named **/1/22**
 e. create a directory named **/1/2/3**
55. If files occupy one disk block, how many disk blocks will the system free up if I remove these four file names:

```
111 -rw-r--r-- 1 me me 100 Jan 1 1:00 a
222 -rw-r--r-- 3 me me 100 Jan 1 1:00 b
222 -rw-r--r-- 3 me me 100 Jan 1 1:00 c
222 -rw-r--r-- 3 me me 100 Jan 1 1:00 d
```

 a. 1 b. 0 c. 3 d. 2 e. 4
56. To change to the parent directory, do this:
 a. `cd ..` b. `cd` c. `cd .`
 d. `pwd` e. `pwd ..`

57. File **a** contains 3 lines. File **b** contains 4 lines. How many lines are output on your screen by this command line: `sort a | echo b`
 a. 3 followed by 4 b. 3 c. 1
 d. 4 e. 3 followed by 1
58. How many files are touched or created? `touch 1 "2 3 ' 4 '" 5`
 a. 2 b. 3 c. 5 d. 1 e. 4
59. If file **foo** occupies one disk block, how many disk blocks are in use after this sequence of commands:
`cp foo bar ; ln bar one ; cp one two ; cp one xxx`
 a. 3 b. 2 c. 4 d. 5 e. 1
60. Which command removes *only* this four-character name containing a special character: `*xyz`
 a. `rm '*xyz` b. `rm '*xyz''` c. `rm "*xyz"`
 d. `rm "*"xyz"` e. `rm *xyz`
61. File **a** contains 2 lines. File **b** contains 3 lines. How many lines are in file **c** after this command line: `ln a d ; ln d c ; cat a b >c`
 a. 5 b. 3 c. 2 d. 4 e. 0
62. In an empty directory, how many words are in file **a** after this:
`echo It's redirected >b isn't it\? ; ls >a`
 a. 2 b. 1 c. 3 d. 0 e. 4
63. If directory **/a** contains these seven two-character names: **aa, ab, ac, ad, a?, a*, a.**, then which command removes *only* the single two-character name **a?** from the directory?
 a. `rm /a/a?` b. `rm /a/a*` c. `rm /a/a\?`
 d. `rm /a/a[*]` e. `rm /a?`
64. If files occupy one disk block, how many disk blocks will the system free up if I remove these four file names:

```
111 -rw-r--r-- 3 me me 100 Jan 1 1:00 a
111 -rw-r--r-- 3 me me 100 Jan 1 1:00 b
222 -rw-r--r-- 3 me me 100 Jan 1 1:00 c
222 -rw-r--r-- 3 me me 100 Jan 1 1:00 d
```

 a. 4 b. 3 c. 0 d. 1 e. 2
65. The output of the `whoami` command is:
 a. a list of users logged in to the system
 b. the current directory
 c. a list of accounts in the password file
 d. your userid
 e. your HOME directory

66. If `/bin/xxx` is a program that outputs **one** and `/usr/bin/xxx` is a program that outputs **two**, what would be the output on your screen of this two command sequence: `PATH=/bin/xxx:/usr/bin/xxx:/etc/passwd ; xxx`
- two
 - two followed by one
 - one followed by two
 - one
 - `bash: xxx: command not found`
67. Which one of these names is usually a shell environment variable?
- FOOBAR
 - FooBar
 - foobar
 - fooBar
 - FooBar
68. How many arguments are passed to the command by the shell:
`<bat bat -b "-a -r" >bat bat bat`
- 5
 - 7
 - 6
 - 4
 - 3
69. What is the link count of file **a** after these successful commands?
`ln a d ; cp a f ; ln d c ; ln f g ; ln c e`
- 1
 - 2
 - 4
 - 5
 - 3
70. If files occupy one disk block, how many disk blocks will the system free up if I remove these four file names:
111 -rw-r--r-- 2 me me 100 Jan 1 1:00 a
222 -rw-r--r-- 2 me me 100 Jan 1 1:00 b
333 -rw-r--r-- 2 me me 100 Jan 1 1:00 c
444 -rw-r--r-- 2 me me 100 Jan 1 1:00 d
- 2
 - 0
 - 3
 - 4
 - 1
71. What is the link count of file **f** after these successful commands?
`rm f ; touch f ; ln f a ; ln a b
cp f c ; ln c x ; rm b ; mv a b`
- 4
 - 1
 - 2
 - 0
 - 3
72. What is the output of this command line if run in an empty directory:
`touch A a ; echo * >"*" ; ls`
- * A a
 - A a >*
 - No output
 - A a >A a
 - * >*
73. How many arguments are passed to the command by the shell:
`echo ' one two ' three ' four ' 5'6'`
- 4
 - 9
 - 1
 - 5
 - 6
74. If you are in `/etc` and `ls -l` shows a symbolic link `bar -> foo` then dereference the absolute path of `bar` with no symbolic links:
- /foo
 - /etc/foo/bar
 - /bar/foo
 - /etc/bar/foo
 - /etc/foo

75. What is true about this output from `ls -il foo bar`?
- ```
15 -rwxrwxrwx 2 bin bin 3 Jul 31 12:33 foo
15 -rwxrwxrwx 3 bin bin 3 Jul 31 12:33 bar
```
- `foo` and `bar` each have three names (six names total)
  - `foo` and `bar` are names for different files
  - this output is not possible
  - `foo` and `bar` are two of three names for the same file
  - `foo` and `bar` are names for the same file
76. How many arguments are passed to the command by the shell:  
`<f z " a 'b c' d " 1 2 ' g " h " ' >z`
- 2
  - 4
  - 3
  - 6
  - 5
77. What is the output on your screen after these command lines:  
`echo one >x ; ln x y ; echo ten >y  
echo two >x ; cat y`
- no output on screen
  - one followed by ten and two
  - two
  - ten
  - one
78. If `/bin/xxx` is a program that outputs **one** and `/usr/bin/xxx` is a program that outputs **two**, what would be the output on your screen of this two command sequence: `PATH=/etc:/usr/bin:/usr:/bin ; /bin/xxx`
- two
  - one followed by two
  - one
  - two followed by one
  - `bash: /bin/xxx: command not found`
79. What is the link count of file **f** after these successful commands?  
`rm f ; touch f ; ln f bar  
cp bar x ; ln x y ; ln bar z ; ln z a`
- 3
  - 1
  - 2
  - 5
  - 4
80. If file **one** occupies one disk block, how many disk blocks are in use after this sequence of commands:  
`cp one foo ; ln foo two ; ln two bar ; ln one cow`
- 1
  - 2
  - 5
  - 3
  - 4
81. How many arguments are passed to the command by the shell:  
`<wc wc " 1 '2 3' 4 " 5 6 ' 7 " 8 " ' >wc 9`
- 2
  - 5
  - 3
  - 4
  - 6
82. How many arguments are passed to the command by the shell:  
`echo 'And it's not hard, it's just logical.'`
- 7
  - 5
  - 4
  - 6
  - 3

83. What is the link count of file **f** after these successful commands?  
`rm f ; touch f ; cp f x`  
`ln f a ; ln x y ; ln a z ; ln z q`  
 a. 5            b. 6            c. 2            d. 4            e. 3
84. If **foo** were a readable empty file, what would be the output on your screen of this two command sequence:  
`PATH=/etc/passwd:/bin/ls:/bin/cat ; /bin/cat foo`  
 a. **bash: cat: command not found**  
 b. **/bin/cat: foo: No such file or directory**  
 c. **bash: ls: command not found**  
 d. no output on screen  
 e. **bash: /bin/cat: command not found**
85. Which command removes *only* this five-character name containing a special character: **date**?  
 a. `rm date\?`            b. `rm date\*`            c. `rm ./date\?`  
 d. `rm date/?`            e. `rm ./date?`
86. What is the output on your screen after this two-command sequence if run in a directory containing 8 files with names that are all the numbers from 1 to 8 inclusive: `cow="*" ; echo "$cow"`  
 a. `*`  
 b. `$cow`  
 c. `'$cow'`  
 d. the file names 1 through 8  
 e. the file names 1 through 8, surrounded by quotes
87. Which command line below shows only lines 6-10 of file **foo**?  
 a. `head -6 foo | tail -10`            b. `head -10 foo | tail -5`  
 c. `tail -10 foo | head -6`            d. `head -10 foo | tail -6`  
 e. `tail -15 foo | head -5`
88. What is the link count of directory **z** after these successful commands?  
`mkdir z ; cd z ; touch a b ; mkdir c d e`  
 a. 6            b. 4            c. 3            d. 5            e. 7
89. File **a** contains 2 lines. File **b** contains 3 lines. How many lines are in file **c** after this command line: `ln a d ; ln d e ; ln b f >c`  
 a. 5            b. 0            c. 2            d. 3            e. 4
90. What is the link count of directory **z** after these successful commands?  
`mkdir z ; cd z ; touch a ; ln a b ; ln a c`  
 a. 1            b. 5            c. 2            d. 3            e. 4
91. What is the link count of file **foo** after these successful commands?  
`rm foo ; touch foo ; ln foo bar`  
`cp bar x ; ln x y ; ln bar z ; ln z a`  
 a. 4            b. 1            c. 2            d. 3            e. 5

92. Which command removes *only* this four-character name containing a special character: **?xyz**  
 a. `rm '?xyz'`            b. `rm ?xyz`            c. `rm ?'xyz'`  
 d. `rm ''?xyz`            e. `rm '?xyz'`
93. What is the link count of file **foo** after these successful commands?  
`rm foo ; touch foo ; ln foo bar`  
`cp bar a ; ln a b ; ln bar c ; cp c a`  
 a. 1            b. 2            c. 5            d. 4            e. 3
94. If `/bin/foo` is a program that outputs **mom** and `/usr/bin/foo` is a program that outputs **dad**, what would be the output on your screen of this two command sequence: `PATH=/dev:/usr/bin:/usr:/bin:/etc ; /bin/foo`  
 a. **mom**  
 b. **mom** followed by **dad**  
 c. **bash: /bin/foo: command not found**  
 d. **dad** followed by **mom**  
 e. **dad**
95. In an empty directory, what is the output on your screen after this command line:  
`echo hi >a ; mv a b ; ln b c ; ls >wc -l`  
 a. `a`            b. `2`            c. `1`  
 d. `0`            e. no output
96. What is the link count of file **f** after these successful commands?  
`rm f ; touch f ; ln f bar`  
`cp bar x ; ln x y ; ln bar z`  
 a. 3            b. 1            c. 5            d. 2            e. 4
97. What is the link count of directory **d** after these successful commands?  
`mkdir d ; mkdir d/a ; mkdir d/b ; mkdir d/b/c`  
 a. 2            b. 1            c. 5            d. 4            e. 3
98. If files occupy one disk block, how many disk blocks will the system free up if I remove these four file names:  
`111 -rw-r--r-- 1 me me 100 Jan 1 1:00 a`  
`222 -rw-r--r-- 2 me me 100 Jan 1 1:00 b`  
`333 -rw-r--r-- 2 me me 100 Jan 1 1:00 c`  
`444 -rw-r--r-- 1 me me 100 Jan 1 1:00 d`  
 a. 4            b. 3            c. 2            d. 1            e. 0
99. What is the link count of directory **z** after these successful commands?  
`mkdir z ; mkdir z/a z/a/b z/a/c z/a/d`  
 a. 4            b. 2            c. 5            d. 1            e. 3
100. What is the link count of directory **d** after these successful commands?  
`mkdir d ; mkdir d/a d/b ; touch d/c d/e`  
 a. 3            b. 2            c. 4            d. 5            e. 1

101. Rewrite as a simplified absolute path:  
`/home/me/../../you/../../../../etc/../../home/me/../../you/../../me/../../foo`  
 a. `/home/me/foo`                      b. `/foo`  
 c. `/etc/foo`                              d. `/home/foo`  
 e. `/home/you/foo`
102. What is the link count of directory **d** after these successful commands?  
`mkdir d ; cd d ; touch a ; mkdir b c`  
 a. 3                      b. 6                      c. 4                      d. 2                      e. 5
103. File **a** contains 2 lines. File **b** contains 3 lines. How many lines are in file **c** after this command line: `sort a b >c ; cat a >>b ; cat c b >c a`  
 a. 7                      b. 5                      c. 12                      d. 0                      e. 8
104. What is the link count of directory **d** after these successful commands?  
`mkdir d ; touch f ; cd d ; ln ../f x`  
 a. 3                      b. 5                      c. 4                      d. 1                      e. 2
105. Which command usually goes in your `.bash_profile` file?  
 a. `cat .bashrc`                      b. `.bashrc source`  
 c. `source ./bashrc`                      d. `.bash_profile source`  
 e. `source ./bash_profile`
106. What is the link count of directory **foo** after these successful commands?  
`mkdir foo ; cd foo ; touch a b c`  
 a. 5                      b. 4                      c. 1                      d. 2                      e. 3
107. What is the output on your screen after this two-command sequence if run in a directory containing 8 files with names that are all the numbers from 1 to 8 inclusive: `cow="*" ; echo "$cow"`  
 a. `*`  
 b. the file names 1 through 8  
 c. `'$cow'`  
 d. the file names 1 through 8, surrounded by quotes  
 e. `$cow`
108. If file **foo** occupies one disk block, how many disk blocks are in use after this sequence of commands:  
`cp foo bar ; ln bar one ; cp one two ; ln one pig`  
 a. 5                      b. 3                      c. 2                      d. 1                      e. 4
109. If directory **dir** contains only these five two-character names: **a?**, **11**, **?1**, **1\***, **.1**, then which command removes *only* the single two-character name **?1** from the directory?  
 a. `rm dir/*1`                      b. `rm dir/\??`                      c. `rm dir/?1`  
 d. `rm dir/1*`                      e. `rm dir/??`

110. What is in file **out** after this command line:  
`echo me >a ; ln a b ; echo hi >b ; ln a out ; rm a b`  
 a. **me**                                      b. **me** followed by **hi**  
 c. nothing (empty file)                      d. no such file (nonexistent)  
 e. **hi**
111. What is the link count of directory **z** after these successful commands?  
`mkdir z ; mkdir z/a ; touch z/b z/c z/d`  
 a. 2                      b. 5                      c. 1                      d. 4                      e. 3
112. How many files are touched or created? `touch 1 "2 3" '4' 5`  
 a. 3                      b. 6                      c. 5                      d. 4                      e. 2
113. Which of the following is true, given this long directory listing:  
`drwxr-x--x 128 me me 32 Jan 1 1:00 dir`  
 a. The number 128 is the count of links (names) this directory has.  
 b. The number 128 is the size of this directory.  
 c. The number 32 is the count of links (names) this directory has.  
 d. The number 128 is the inode number of this directory.  
 e. The number 32 is the inode number of this directory.
114. In an empty directory, what is in file **count** after this command line:  
`ls ??? | wc -w >count`  
 a. nothing (empty file)                      b. 1  
 c. 1 1 1                                      d. 0  
 e. 1 1 2
115. If directory **/a** contains these seven two-character names: **aa**, **ab**, **ac**, **ad**, **a\***, **a?**, **??**, then which command removes *only* the single two-character name **a?** from the directory?  
 a. `rm /a/a?`                      b. `rm "/a?"`                      c. `rm '/a/a?'`  
 d. `rm /a\?`                              e. `rm /a/?\?`
116. What is the link count of file **f** after these successful commands?  
`rm f ; touch f ; ln f b ; cp f c`  
`cp b x ; ln x y ; ln b z ; ln z a`  
 a. 1                      b. 3                      c. 2                      d. 4                      e. 5
117. What is the output on your screen after this command line:  
`echo 1 >x ; ln x y ; echo 2 >>y ; sort x`  
 a. 1 followed by 2                      b. 1                      c. no output  
 d. 2                                      e. 2 followed by 1
118. If your **PATH** variable contains **/bin:/usr/bin**, what is the output of this command line: `echo '$PATH'`  
 a. `'/bin:/usr/bin'`  
 b. `$PATH`  
 c. `'$PATH'`  
 d. `echo: $PATH: No such file or directory`  
 e. `/bin:/usr/bin`





135. What is the link count of directory **x** after these successful commands?  
`mkdir x ; mkdir x/y ; mkdir x/z ; mkdir x/y/z`  
 a. 3            b. 4            c. 2            d. 5            e. 1
136. Rewrite as a simplified absolute path:  
`../../../../var/./a/../../../../var/b/../../../../etc/./bar/./foo`  
 a. /etc/bar/foo            b. /etc/foo            c. /var/b/foo  
 d. /var/foo            e. /var/a/foo
137. If `/bin/foo` is a program that outputs **one** and `/usr/bin/foo` is a program that outputs **two**, what would be the output on your screen of this two command sequence: `PATH=/etc:/usr/bin:/usr:/bin:/dev ; foo`  
 a. **one**  
 b. **one** followed by **two**  
 c. **two** followed by **one**  
 d. `bash: foo: command not found`  
 e. **two**
138. How many arguments are passed to the command by the shell:  
`echo " one '2 three' 4 "five 6 ' 7 "8 ' >out`  
 a. 5            b. 4            c. 3            d. 6            e. 2
139. What is the link count of directory **d** after these successful commands?  
`mkdir d ; mkdir d/a ; touch d/b`  
 a. 5            b. 3            c. 4            d. 2            e. 1
140. Create a symbolic link under `/usr` named **bar** that has target **xy**:  
 a. `ln -s 'xy' /bar/usr`  
 b. `ln -s 'xy' '/usr/bar'`  
 c. `ln -s /usr/bar '/usr/xy'`  
 d. `ln -s /usr/bar 'xy'`  
 e. `ln -s '/usr/xy' /usr/bar`
141. How many arguments are passed to the command by the shell:  
`<foo foo -x " " -z -r" " >foo 'foo foo'`  
 a. 5            b. 6            c. 8            d. 7            e. 9
142. How many files are touched or created?  
`touch '1 "2 3 '4'" ' 5`  
 a. 4            b. 2            c. 5            d. 1            e. 3
143. What is the link count of file **foo** after these successful commands?  
`rm foo ; touch foo ; ln foo bar`  
`cp bar x ; ln x y ; ln y z`  
 a. 4            b. 2            c. 0            d. 1            e. 3
144. File **a** contains 2 lines. File **b** contains 3 lines. How many lines are in file **c** after this command line: `ln a d ; ln d c ; cp c b ; sort a b d >c`  
 a. 4            b. 0            c. 6            d. 5            e. 2

145. In an empty directory, what is the output on your screen of this command line:  
`echo hi >foo ; cp foo bar | wc -l`  
 a. 2            b. 1            c. 3  
 d. no output            e. 0
146. What is true about this output from `ls -il foo bar`  
`15 -r-x----- 2 me me 3 Jan 1 1:00 foo`  
`15 -rwxrwxrwx 2 me me 3 Jan 1 1:00 bar`  
 a. **foo** and **bar** each have three names (six names total)  
 b. this output is not possible  
 c. **foo** and **bar** are two of three names for the same file  
 d. **foo** and **bar** are names for the same file  
 e. **foo** and **bar** are names for different files
147. What displays on your screen given this command:  
`ls >ls ; wc ls >wc ; sort ls | cat wc`  
 a. **sort** displays the **ls** and **cat** displays the **wc**  
 b. only the **wc** displays because **cat** ignores the pipe  
 c. only the **ls** displays because **cat** ignores the pipe  
 d. **cat** reads the pipe and the **wc** and displays both together  
 e. nothing displays because **cat** ignores the pipe
148. If `/bin/bat` is a program that outputs **foo** and `/usr/bin/bat` is a program that outputs **bar** what would be the output on your screen of this two command sequence: `PATH=/usr:/usr/bin:/bin ; bat`  
 a. **foo** followed by **bar**  
 b. `bash: bat: command not found`  
 c. **bar**  
 d. **bar** followed by **foo**  
 e. **foo**
149. What is the link count of directory **d** after these successful commands?  
`mkdir d ; mkdir d/a ; mkdir d/a/b ; mkdir d/a/c`  
 a. 3            b. 5            c. 1            d. 2            e. 4
150. If `/bin/pig` is a program that outputs **xx** and `/usr/bin/pig` is a program that outputs **foo** what would be the output on your screen of this two command sequence: `PATH=/home:/bin:/dev:/usr/bin ; pig`  
 a. **foo** followed by **xx**  
 b. **xx**  
 c. `bash: pig: command not found`  
 d. **foo**  
 e. **xx** followed by **foo**
151. How many arguments are passed to the command by the shell:  
`<pig pig -x " " -z -r" " >pig pig pig`  
 a. 6            b. 9            c. 5            d. 8            e. 7

152. Which command line would show the index (inode) number of a file?  
 a. `ls -i file`            b. `ls -l file`            c. `find -i file`  
 d. `cat -i file`            e. `cat -l file`
153. File **a** contains 2 lines. File **b** contains 3 lines. How many lines are in file **c** after this command line:  
`ln a e ; ln b d ; ln d c ; cp d e ; sort a b e d >c`  
 a. 12            b. 4            c. 7            d. 10            e. 6
154. If you want a user-defined alias in all your **bash** shells, what do you do?  
 a. define the alias in my file `$HOME/.bashrc`  
 b. put the alias into the `/etc/group` file for next log in  
 c. create the alias and then type "save" to save it to all shells  
 d. put the alias into the `grub.conf` file for next log in  
 e. put the alias into the `/etc/passwd` file for next log in
155. In an empty directory, how many files are created by this command line:  
`touch 1 "2 3" '4' 5`  
 a. 5            b. 3            c. 7            d. 6            e. 4
156. What is the resulting link count of empty directory **dir** after these successful commands? `cd dir ; touch foo ; ln foo one ; ln foo two`  
 a. 1            b. 3            c. 5            d. 4            e. 2
157. If files occupy one disk block, how many disk blocks will the system free up if I remove these four file names:  

```
111 -rw-r--r-- 1 me me 100 Jan 1 1:00 a
222 -rw-r--r-- 1 me me 100 Jan 1 1:00 b
333 -rw-r--r-- 1 me me 100 Jan 1 1:00 c
444 -rw-r--r-- 2 me me 100 Jan 1 1:00 d
```

 a. 0            b. 4            c. 1            d. 2            e. 3
158. Which command shows the name of the current computer:  
 a. `hostname`            b. `find`            c. `comname`  
 d. `history`            e. `whoami`
159. What is in file **c** after this command line:  
`echo foo >a ; ln a b ; echo bar >>b ; ln a c ; rm a`  
 a. `foo`            b. `bar`  
 c. no such file (nonexistent)            d. `foo` followed by `bar`  
 e. nothing (empty file)
160. If `/bin/foo` is a program that outputs **one** and `/usr/bin/foo` is a program that outputs **two**, what would be the output on your screen of this two command sequence: `PATH=/dev:/usr/bin:/usr:/bin:/etc ; /bin/foo`  
 a. `bash: /bin/foo: command not found`  
 b. **one** followed by **two**  
 c. **one**  
 d. **two** followed by **one**  
 e. **two**

161. If you are in `/bin` and `ls -l` shows a symbolic link **foo** -> `/bar` then dereference the absolute path of **foo** with no symbolic links:  
 a. `/foo/bar`            b. `/bar`            c. `/bin/bar`  
 d. `/bin/foo/bar`            e. `/bin/bar/foo`
162. Rewrite as a simplified absolute path:  
`/usr/./bin/../../lib/../../../../etc/./usr/./lib/./bin/./bar`  
 a. `/etc/bar`            b. `/usr/bar`            c. `/usr/lib/bar`  
 d. `/bar`            e. `/usr/bin/bar`
163. Which command line outputs inode/filename pairs for names in the current directory, sorted by inode number?  
 a. `ls -node * > sort -n`            b. `sort -n | ls -ai`  
 c. `ls .* | sort -node`            d. `ls -ai | sort -n`  
 e. `ls -i * > sort -n`
164. If you are in `/etc` and `ls -l` shows a symbolic link **bar** -> `../foo` then dereference the absolute path of **bar** with no symbolic links:  
 a. `/bar/foo`            b. `/foo`            c. `/etc/foo/bar`  
 d. `/etc/bar/foo`            e. `/etc/foo`
165. How many arguments are passed to the command by the shell:  
`echo 'It's "1 2" isn't it? I can't decide.`  
 a. 4            b. 6            c. 5            d. 3            e. 2
166. Which of the following **PATH** statements makes the most sense?  
 a. `PATH=/bin:/usr/bin:/etc/passwd`  
 b. `PATH=/bin/bash:/usr/bin:/bin`  
 c. `PATH=/bin/ls:/etc/passwd:/usr/bin`  
 d. `PATH=/bin:/usr/bin`  
 e. `PATH=/bin:/etc/passwd:/usr/bin`
167. What is the output on your screen after this command line:  
`echo one >x ; ln x y ; echo two >>y ; sort x`  
 a. **one**            b. no output  
 c. **two**            d. **one** followed by **two**  
 e. **two** followed by **one**
168. What is the link count of file **foo** after these successful commands?  
`rm foo ; touch foo ; ln foo bar ; ln bar x`  
`cp bar a ; ln a b ; ln x c ; cp c d`  
 a. 4            b. 2            c. 3            d. 5            e. 1
169. Dereference the following symlink **xyz** into its equivalent absolute path:  
`ln -s ../../a/./b/./bar /tmp/a/b/xyz`  
 a. `/tmp/bar`            b. `/tmp/b/bar`            c. `/tmp/a/b/bar`  
 d. `/tmp/b/xyz`            e. `/tmp/a/bar`

170. Which command line shows just the count of words in the file?
- `wc file | awk '{print 2}'`
  - `wc file | awk '{print #2}'`
  - `wc file | awk '{print $2}'`
  - `wc file | awk '[print $2]'`
  - `wc file | awk '[print #2]'`
171. What is the output on your screen after these command lines:  
`echo one >x ; ln x y ; echo two >y`  
`echo ten >x ; cat y`
- `two`
  - `ten`
  - `one`
  - `one` followed by `two` and `ten`
  - no output on screen
172. Which command line allows programs in the current directory to execute without preceding the names with `./`? (P.S. Security Risk! Don't do this!)
- `$PATH=/usr/bin:./bin`
  - `PATH=/bin:/usr/bin:.`
  - `PATH=./$HOME:/usr/bin`
  - `$PATH=.:$HOME:/usr/bin`
  - `PATH=/usr/bin/.:$HOME`
173. File `a` contains 2 lines. File `b` contains 3 lines. How many lines are output on your screen by this command line: `cat b | cat a`
- 3
  - 3 followed by 2
  - 2 followed by 3
  - 5
  - 2
174. If your `PATH` contained only the file names `/bin/sh`, `/bin/cat`, and `/bin/ls`, then what would be the output on your screen of this command:  
`cat /etc/passwd`
- `cat: bash: no such file or directory`
  - `bash: cat: command not found`
  - `bash: /bin/sh: command not found`
  - `bash: /bin/cat: no such file or directory`
  - `cat: /etc/passwd: command not found`
175. What is usually in the environment variable `$SHELL`?
- the relative path of the `/home/shell` directory
  - the relative path of the system `/shell` directory
  - the relative path of your login shell
  - the absolute path of your login shell
  - the absolute path of the system `/shell` directory

176. If `/bin/xxx` is a program that outputs `one` and `/usr/bin/xxx` is a program that outputs `two`, what would be the output on your screen of this two command sequence: `PATH=/usr:/usr/bin:/etc:/bin ; xxx`
- `one`
  - `two`
  - `one` followed by `two`
  - `two` followed by `one`
  - `bash: xxx: command not found`
177. What is true about this output from `ls -il foo bar`
- ```
35 -rw-rw-r-- 2 me me 3 Jan 1 1:00 foo
36 -rw-rw-r-- 2 me me 3 Jan 1 1:00 bar
```
- this output is not possible
 - `foo` and `bar` each have two names (four names total)
 - `foo` and `bar` are two of three names for this file
 - `foo` and `bar` are names for the same file
 - `foo` and `bar` each have three names (six names total)
178. What is usually in the environment variable `$PATH`?
- the absolute path of the system `/path` directory
 - a colon-separated list of directories containing command names
 - the absolute path of your login shell
 - the absolute path of your login home directory
 - a colon-separated list of your `passwd` file fields
179. What is the link count of directory `dir` after these successful commands?
`mkdir dir ; cd dir ; touch a b c ; mkdir d e`
- 5
 - 7
 - 2
 - 4
 - 3
180. If the file `bat` contained the word `foo`, what would be the output on your screen of this two command sequence:
`PATH=/bin/cat:/bin/who:/bin/ls ; cat bat`
- no output on screen
 - `foo`
 - `bash: cat: command not found`
 - `bat`
 - `cat: bat: No such file or directory`
181. How many arguments are passed to the command by the shell:
`echo " 1 2 " three ' 4 ' five"6"`
- 1
 - 5
 - 3
 - 4
 - 9
182. What is the output on your screen after this command line:
`mkdir foo ; rmdir foo | wc -c`
- 3
 - 1
 - 0
 - 4
 - no output

201. How many arguments are passed to the command by the shell:
`echo " 1 '2 3' 4 "5 6 ' 7 "8 ' >out`
 a. 3 b. 4 c. 6 d. 5 e. 2
202. File **a** contains 2 lines. File **b** contains 3 lines. How many lines are in file **c** after this command line: `ln a d ; ln b e ; cp d e >c`
 a. 0 b. 4 c. 2 d. 3 e. 5
203. If the file **pig** contained the word **bar**, what would be the output on your screen of this two command sequence:
`PATH=/etc/passwd:/bin/ls:/bin/who ; /bin/cat pig`
 a. `/bin/cat: pig: No such file or directory`
 b. no output on screen
 c. `pig`
 d. `bar`
 e. `bash: /bin/cat: command not found`
204. **Did you read all the words of the test instructions on page one?**
 a. **Taip** (*Yes - Lithuanian*) b. **Tak** (*Yes - Polish*)
 c. **Sim** (*Yes - Portuguese*) d. **Jes** (*Yes - Esperanto*)
 e. **Igen** (*Yes - Hungarian*)

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