This file contains two practice tests. The first test (Test Version 583) contains questions about hard links.
The second test (Test Version 896) contains questions about quoting and redirection.

* Test Version 583 (61 questions)
* Test Version 806 (200 questions)

PRINT Name: _____ **Lab Section:** | | | |

Test Version: 583 **One-Answer Multiple Choice** **61 Questions - 25 of 25%**

1. Read **all** the instructions and **both** sides (back and front) of all pages.
2. Put the **Test Version** above into **NO. OF QUESTIONS** and **NO. OF STUDENTS**
3. Answer the questions you know, first. One Answer Only per question.
4. Manage your time when answering questions on this test!

(Office use only: 58 54 11 55 25 42 49 3 50 46 18 57 36 20 13 8 1 34 27 44 47 41 14 28 45 22 29 5 53 10 21 9 2 30 52 60 31 23 59 38 35 48 51 7 16 15 56 4 19 17 43 26 6 32 12 37 61 40 39 24 33)

1. Which of the following is true, given this long directory listing:
   `drwxr-x--x 71 user staff 4096 May 30 12:35 dir`
   a. The number 71 is the inode number of this directory.
   b. The number 4096 is the inode number of this directory.
   c. The number 71 is the count of links (names) this directory has.
   d. The number 4096 is the count of links (names) this directory has.
   e. The number 71 is the size of this directory.
2. Which of the following is true, given this long directory listing:
   `drwxr-x--x 256 ian user 512 May 30 12:35 dir`
   a. The number 256 is the octal permissions of this directory.
   b. The number 256 is the size of this directory.
   c. The number 512 is the count of links (names) this directory has.
   d. The number 512 is the size of this directory.
   e. The number 256 is the inode number of this directory.
3. If you type the command **`echo 'missing quote ,`**
   which key sequence will interrupt it and take you back to the command prompt?
   a. **`[CTRL-U]`** *b.* **`[CTRL-D]`** *c.* **`[CTRL-C]`**
   d. **`[CTRL-L]`** *e.* **`[CTRL-R]`**
4. Which of the following is true, given this long directory listing:
   `drwxr-x--x 456 ian user 123 May 30 12:35 dir`
   a. The number 123 is the count of links (names) this directory has.
   b. The number 456 is the inode number of this directory.
   c. The number 456 is the size of this directory.
   d. The number 456 is the octal permissions of this directory.
   e. The number 123 is the size in bytes of this directory.
5. What is the link count of directory **`foo`** after this set of successful commands?
   `mkdir foo ; cd foo ; touch a b c`
   a. 3 *b.* 5 *c.* 2 *d.* 4 *e.* 1

6. What is true about this output from **`ls -ild foo bar`**?
   `816 -rwxr-xr-x 2 root root 3 Jan 24 01:03 foo`
   `816 drwxr-xr-x 2 root root 3 Jan 24 01:03 bar`
   a. **`foo`** and **`bar`** are two of three names for this file
   b. this output is not possible
   c. **`foo`** and **`bar`** are names for different files
   d. **`foo`** and **`bar`** each have three names (six names total)
   e. **`foo`** and **`bar`** are names for the same file
7. Which command line lists all possible utilities available for sorting files?
   a. **`man | grep sort`** *b.* **`grep sort /etc/passwd`**
   c. **`grep /etc/passwd sort`** *d.* **`man sort`**
   e. **`man -k sort`**
8. How can you ask the **`bash`** (Linux) shell to complete commands or file names for you?
   a. Type the first part of the command or file name and press the **`[TAB]`** key.
   b. Type the first part of the command or file name and press the **`[ALT]-[F1]`** key.
   c. Type the first part of the command or file name and press the **`[CTRL]-[C]`** key.
   d. Type the first part of the command or file name and press the **`[ALT]`** key.
   e. Type the first part of the command or file name and press the **`[CTRL]-[D]`** key.
9. Which command line would show the inode number of a file?
   a. **`ls -l file`** *b.* **`cat -l file`** *c.* **`find -i file`**
   d. **`cat -i file`** *e.* **`ls -i file`**
10. Which command line below does not show any lines from inside the file **`dog`**?
    a. **`more dog`** *b.* **`tail dog`** *c.* **`ls dog`**
    d. **`head dog`** *e.* **`less dog`**
11. What is the link count of directory **`d`** after this set of successful commands?
    `mkdir d ; cd d ; touch f ; ln f x ; ln f y`
    a. 5 *b.* 2 *c.* 4 *d.* 3 *e.* 1
12. Which of the following is true, given this long directory listing:
    `drwxr-x--x 71 ian user 512 May 30 12:35 dir`
    a. The number 512 is the count of links (names) this directory has.
    b. The number 71 is the count of links (names) this directory has.
    c. The number 71 is the size of this directory.
    d. The number 71 is the inode number of this directory.
    e. The number 512 is the inode number of this directory.

13. What is true about this output from **`ls -il foo bar`**
```
72 -rwxrwxrwx 2 bin  bin  3 Oct 30 09:23 foo
72 -r--r--r-- 2 bin  bin  3 Oct 30 09:23 bar
```
a. **`foo`** and **`bar`** are names for different files
b. **`foo`** and **`bar`** each have two names (four names total)
c. this output is not possible
d. **`foo`** and **`bar`** are names for the same file
e. **`foo`** and **`bar`** are two of three names for this file

14. What is the link count of directory **`d`** after this set of successful commands?
```
mkdir d ; touch f ; cd d ; ln ../f x
```
a. 3 *b.* 1 *c.* 2 *d.* 4 *e.* 5

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

16. 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 ten
```
a. 3 blocks *b.* 2 blocks *c.* 4 blocks
d. 1 block *e.* 5 blocks

17. Given this long listing:
```
drwxr-xr-x 448 me me 296 Dec 4 9:12 dir
```
How many subdirectories lie immediately under **`dir`**?
a. there is not enough information shown to answer the question
b. 448
c. 446
d. 296
e. 294

18. What is true about this output from **`ls -il foo bar`**
```
23 -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 two of three names for this file
b. this output is not possible
c. **`foo`** and **`bar`** each have two names (four names total)
d. **`foo`** and **`bar`** are names for the same file
e. **`foo`** and **`bar`** are names for different files

19. What is the link count of file **`f`** after this set of successful commands?
```
rm f ; touch f ; cp f x
ln f a ; ln x y ; ln a z ; ln x b
```
a. 4 *b.* 2 *c.* 3 *d.* 6 *e.* 5

20. Which command displays the contents of the Unix **`passwd`** file one page at a time?
a. **`cat /etc/passwd`** *b.* **`more /etc/passwd`**
c. **`page /etc/passwd`** *d.* **`info /etc/passwd`**
e. **`head /etc/passwd`**

21. Which command line below does not show any lines from inside the file **`pig`**?
a. **`ls pig`** *b.* **`tail pig`** *c.* **`head pig`**
d. **`less pig`** *e.* **`more pig`**

22. What is true about this output from **`ls -ild foo bar`**
```
96 -rwxr-xr-x 2 root root 3 Jan 24 01:03 foo
96 -rwxr-xr-x 3 root root 3 Jan 24 01:03 bar
```
a. **`foo`** and **`bar`** are names for the same file
b. **`foo`** and **`bar`** each have three names (six names total)
c. this output is not possible
d. **`foo`** and **`bar`** are two of five names for this file
e. **`foo`** and **`bar`** are names for different files

23. To shut down your Fedora system in an orderly fashion:
a. select "System|Shut down"
b. logout from each terminal and the machine will shut down
c. type the three key **`[CONTROL]-[ALT]-[DEL]`**
d. type the three key **`[CONTROL]-[ALT]-[F1]`**
e. select VMware "VM|Stop this virtual machine"

24. What is the link count of file **`foo`** after this set of successful commands?
```
rm foo ; touch foo ; ln foo bar
cp bar x ; ln x y ; ln bar z ; ln z a
```
a. 5 *b.* 3 *c.* 4 *d.* 1 *e.* 2

25. Which command line below does not show any lines from inside the file **`bat`**?
a. **`head bat`** *b.* **`tail bat`** *c.* **`more bat`**
d. **`less bat`** *e.* **`ls bat`**

26. What is the link count of directory **`dir`** after this set of successful commands?
```
mkdir dir ; cd dir ; touch one ; mkdir two
```
a. 5 *b.* 4 *c.* 3 *d.* 1 *e.* 2

27. What is the link count of file **`foo`** after this set of successful commands?
```
rm foo ; touch foo ; ln foo bar
cp bar x ; ln x y ; ln bar z
```
a. 5 *b.* 3 *c.* 2 *d.* 4 *e.* 1

28. If I have a directory owned by me named **`/a/b/c/7`**, which action would increase its *link count* by exactly one?
a. create a directory named **`/a/b/c/7/d2`**
b. create a directory named **`/a/b/c/7e`**
c. create one file named **`/a/b/c/7/d2`**
d. create a directory named **`/a/b/c/d/e`**
e. create one file named **`/a/b/c/7de`**

29. Which of the following is true, given this long directory listing:
    drwxr-x--x 123 ian user 456 May 30 12:35 dir
    a. The number 123 is the inode number of this directory.
    b. The number 456 is the size of this directory.
    c. The number 123 is the size of this directory.
    d. The number 456 is the count of links (names) this directory has.
    e. The number 123 is the octal permissions of this directory.

30. If my current working directory is **/home**, and my home directory is **/home/xx**, which command copies the password file into my home directory under the name **foo**?
    a. **cp ../../etc/passwd /xx/foo**
    b. **cp xx/../etc/passwd ../home/xx/foo**
    c. **cp ../home/xx/../etc/passwd ./xx/./foo**
    d. **cp ../etc/passwd ../xx/foo**
    e. **cp xx/../../etc/passwd xx/foo**

31. What is the link count of directory **dir** after this set of successful commands?
    mkdir dir ; cd dir ; touch foo ; mkdir a b c
    a. 1 *b.* 4 *c.* 5 *d.* 3 *e.* 2

32. If file **foo** occupies two disk blocks, how many disk blocks are in use after this sequence of commands:
    cp foo bar ; ln bar one ; cp one two ; ln one ten
    a. 10 blocks *b.* 8 blocks *c.* 2 blocks
    d. 4 blocks *e.* 6 blocks

33. Given this long listing:
    drwxr-xr-x 2048 bin bin 4096 Jan 2 14:22 dir
    How many subdirectories lie immediately under **dir**?
    a. 4094
    b. 2046
    c. there is not enough information shown to answer the question
    d. 2048
    e. 4096

34. What is the link count of file **foo** after this set of successful commands?
    rm foo ; touch foo ; ln foo bar
    cp bar x ; ln x y ; ln y z
    a. 4 *b.* 1 *c.* 3 *d.* 0 *e.* 2

35. Which of the following is true, given this long directory listing:
    755 drwxr-x--x 512 ian user 256 May 30 12:35 dir
    a. The number 512 is the count of links (names) this directory has.
    b. The number 256 is the inode number of this directory.
    c. The number 256 is the count of links (names) this directory has.
    d. The number 512 is the size of this directory.
    e. The number 755 is the octal permissions of this directory.

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

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

38. What is the link count of directory **dir** after this set of successful commands?
    mkdir dir ; mkdir dir/foo ; touch dir/bar
    a. 3 *b.* 4 *c.* 5 *d.* 2 *e.* 1

39. Which statement is true, given this long directory listing from **ls**:
    drwxr-x--x 256 ian user 512 May 30 12:35 dir
    a. The number 512 is the count of links (names) this directory has.
    b. The number 256 is the octal permissions of this directory.
    c. The number 256 is the inode number of this directory.
    d. The number 256 is the size of this directory.
    e. The number 512 is the size of this directory.

40. What is true about this output from **ls -il foo bar**?
    861 -rw-r--r-- 2 root root 3 Jan 24 01:03 foo
    861 -rwxr-xr-x 2 bin bin 3 Nov 12 12:55 bar
    a. this output is not possible
    b. **foo** and **bar** are names for the same file
    c. **foo** and **bar** are names for different files
    d. **foo** and **bar** each have three names (six names total)
    e. **foo** and **bar** are two of three names for this file

41. What is true about this output from **ls -il foo bar**
    35 -rw-rw-r-- 2 bin bin 3 Jan 24 01:03 foo
    36 -rw-rw-r-- 2 bin bin 3 Jan 24 01:03 bar
    a. **foo** and **bar** each have two names (four names total)
    b. **foo** and **bar** are two of three names for this file
    c. **foo** and **bar** each have three names (six names total)
    d. this output is not possible
    e. **foo** and **bar** are names for the same file

42. Which command line below never shows any lines from inside the file **cow**?
    a. **head cow** *b.* **grep pattern cow**
    c. **sort cow** *d.* **wc cow**
    e. **tail cow**

43. Which of the following is true, given this long directory listing:
    755 drwxr-x--x 256 ian user 512 May 30 12:35 dir
    a. The number 256 is the octal permissions of this directory.
    b. The number 512 is the size of this directory.
    c. The number 256 is the inode number of this directory.
    d. The number 755 is the count of links (names) this directory has.
    e. The number 512 is the count of links (names) this directory has.

44. If I have a directory owned by me named **/x/y/z**, which action would increase its *link count* by exactly one?
    a. create one file named **/x/y/z/x**
    b. create a directory named **/x/y/z/.**
    c. create a directory named **/x/y/z2**
    d. create one file named **/x/y/z2**
    e. create a directory named **/x/y/z/x**

45. What is the link count of directory **a** after this set of successful commands?
    mkdir a ; mkdir a/b ; mkdir a/c ; mkdir a/b/c
    a. 5 *b.* 3 *c.* 1 *d.* 2 *e.* 4

46. What is the Unix user name for the Super-User account?
    a. **alterego** *b.* **administrator** *c.* **root**
    d. **superuser** *e.* **master**

47. Which of the following is true, given this long directory listing:
    drwxr-x--x 71 ian user 4096 May 30 12:35 dir
    a. The number 71 is the size of this directory.
    b. The number 4096 is the count of links (names) this directory has.
    c. The number 4096 is the inode number of this directory.
    d. The number 71 is the count of links (names) this directory has.
    e. The number 71 is the inode number of this directory.

48. If I have a directory owned by me named **/1/2**, which action would increase its *link count* by exactly one?
    a. create a directory named **/1/2/3** *b.* create one file named **/1/22**
    c. create one file named **/1/2/3** *d.* create a directory named **/1/22**
    e. create a directory named **/1/2**

49. What is the link count of directory **d** after this set of successful commands?
    mkdir d ; mkdir d/a ; touch d/b
    a. 1 *b.* 5 *c.* 3 *d.* 2 *e.* 4

50. What is the link count of directory **d** after this set of successful commands?
    mkdir d ; cd d ; touch a ; mkdir b c d
    a. 3 *b.* 6 *c.* 4 *d.* 2 *e.* 5

51. What would you see if you typed this command: **cat /users**
    a. The contents of your subdirectory named **users**
    b. The contents of your directory named **users**
    c. The contents of the file **users** located in the parent directory
    d. The contents of the file **users** located in the root directory
    e. The contents of the file **users** located in your home directory

52. What is the link count of directory **x** after this set of successful commands?
    mkdir x ; mkdir x/y ; mkdir x/z ; mkdir x/y/z
    a. 1 *b.* 4 *c.* 5 *d.* 3 *e.* 2

53. If I have a directory owned by me named **/a/b/c/d**, which action would increase its *link count* by exactly one?
    a. create one file named **/a/b/c/d2**
    b. create one file named **/a/b/c/d/e**
    c. create a directory named **/a/b/c/d**
    d. create a directory named **/a/b/c/d2**
    e. create a directory named **/a/b/c/d/e**

54. What is the resulting link count of empty directory **dir** after this set of successful commands? **cd dir ; touch foo ; ln foo one ; ln foo two**
    a. 2 *b.* 5 *c.* 4 *d.* 3 *e.* 1

55. If you type the command **sleep 60 ,**
    which key sequence will interrupt it and take you back to the command prompt?
    a. **[CTRL-D]** *b.* **[CTRL-U]** *c.* **[CTRL-C]**
    d. **[CTRL-L]** *e.* **[CTRL-R]**

56. What is true about this output from **ls -il foo bar**?
    816 -rw-r--r-- 2 root root 3 Jan 24 01:03 foo
    817 -rw-r--r-- 2 root root 3 Jan 24 01:03 bar
    a. **foo** and **bar** each have three names (six names total)
    b. **foo** and **bar** are names for the same file
    c. this output is not possible
    d. **foo** and **bar** are names for different files
    e. **foo** and **bar** are two of three names for this file

57. Who is the owner of file **bar** after you execute this sequence of commands in your home directory: **ln /etc/passwd x ; ln x y ; cp y z ; ln y bar**
    a. you own the file **bar**
    b. the file is owned by **passwd**
    c. the file is owned by **root**
    d. the file is owned by **home**
    e. you cannot execute the given commands; no file will be created

58. What is true about this output from **`ls -il foo bar`**?
```
871 -r-------- 3 bin  bin  2 Apr 22 10:15 foo
872 -r-------- 3 bin  bin  2 Apr 22 10:15 bar
```
a. this output is not possible
b. **`foo`** and **`bar`** each have three names (six names total)
c. **`foo`** and **`bar`** are two of three names for this file
d. **`foo`** and **`bar`** each have two names (four names total)
e. **`foo`** and **`bar`** are names for the same file

59. What is true about this output from **`ls -il foo bar`**?
```
871 -r-------- 2 bin  bin  3 Nov 12 12:55 foo
871 -r-------- 2 bin  bin  3 Nov 12 12:55 bar
```
a. **`foo`** and **`bar`** are names for different files
b. **`foo`** and **`bar`** each have three names (six names total)
c. **`foo`** and **`bar`** are two of three names for this file
d. **`foo`** and **`bar`** are names for the same file
e. this output is not possible

60. What is the link count of directory **`dir`** after this set of successful commands?
```
mkdir dir ; touch foo ; cd dir ; ln ../foo bar
```
a. 2 *b.* 3 *c.* 4 *d.* 5 *e.* 1

61. What is true about this output from **`ls -il foo bar`**
```
15 -r-x-----x 2 bin  bin  3 Oct 30 09:23 foo
15 -r-x-----x 2 bin  bin  3 Oct 30 09:23 bar
```
a. this output is not possible
b. **`foo`** and **`bar`** each have three names (six names total)
c. **`foo`** and **`bar`** are names for the same file
d. **`foo`** and **`bar`** are two of three names for this file
e. **`foo`** and **`bar`** are names for different files

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PRINT Name: _____ **Lab Section:** | | | |

Test Version: 806 **One-Answer Multiple Choice 200 Questions - 25 of 25%**

1. Read **all** the instructions and **both** sides (back and front) of all pages.
2. Put the **Test Version** above into **NO. OF QUESTIONS** and **NO. OF STUDENTS**
3. Answer the questions you know, first. One Answer Only per question.
4. Manage your time when answering questions on this test!

(Office use only: 180 189 62 152 99 46 182 60 17 85 176 199 165 44 123 106 129 175 193 97 113 142 9 187 174 110 1 153 96 84 26 186 42 198 115 171 2 25 194 103 14 18 116 166 104 168 169 148 162 77 15 79 95 54 88 177 50 102 139 126 74 23 82 43 128 195 29 101 130 83 33 158 75 179 145 22 112 80 90 100 93 36 52 12 134 61 59 31 143 108 138 91 41 65 156 124 11 56 131 167 21 34 27 48 107 71 125 72 30 192 94 70 151 57 35 147 200 164 32 127 161 38 120 98 5 87 53 76 58 81 190 109 163 144 16 20 137 155 3 170 66 39 188 86 133 154 69 184 185 118 6 157 68 78 67 4 122 73 117 45 178 196 146 92 10 40 119 197 132 63 172 135 159 89 64 114 136 8 37 28 150 47 183 191 55 140 13 149 19 24 105 181 173 160 121 111 7 141 51 49)

1. Which command pipeline outputs the count of the number of pathnames (including all subdirectories) that lie under the current directory?
   a. **`dir / | wc`** *b.* **`ls . | wc`** *c.* **`ls / | wc`**
   d. **`find . | wc`** *e.* **`file . | wc`**
2. Which of the following commands will leave **`file1`** non-empty?
   a. **`sort file1 > file1`** *b.* **`head file1 > file1`**
   c. **`tail file1 > file1`** *d.* **`wc file1 > file1`**
   e. **`cat file1 > file1`**
3. In an empty directory, what is the output on your screen after this command line:
   `ls 1>/dev/null nosuchfile`
   a. **`nosuchfile`**
   b. **`ls: nosuchfile: No such file or directory`**
   c. **`ls: /dev/null: No such file or directory`**
   d. **`ls: 1>/dev/null nosuchfile: No such file or directory`**
   e. no output
4. Which command below removes *only* this five-character file name containing a special character (and no others): **`date?`**
   a. **`rm date/?`** *b.* **`rm date\*`** *c.* **`rm ./date\?`**
   d. **`rm ./date?`** *e.* **`rm date\\?`**
5. What is the output of this command line in an empty directory:
   `touch .1 .2 .3 4 5 6 ; echo .*`
   a. **`.*`**
   b. **`4 5 6`**
   c. **`.1 .2 .3 4 5 6`**
   d. an error message from **`echo`** saying **`.*`** does not exist
   e. **`. .. .1 .2 .3`**

6. If file **`foo`** contains 9 lines, each of which is the one-digit line number of the line in the file (**`1`** through **`9`**), what is the output on your screen of this command:
   `cat foo foo | cat | tail -4 | head -1`
   a. **`8`** *b.* **`9`** *c.* **`7`** *d.* **`5`** *e.* **`6`**
7. Which of the command lines below can generate a non-empty file?
   a. **`head -1 file >file`**
   b. **`sort -r file >file`**
   c. **`ls -l file >file`**
   d. **`cat file >file`**
   e. **`grep pattern file >file`**
8. In a directory containing one file named **`dog`**, what is the output on your screen after this command line: **`1>/dev/null ls *`**
   a. no output
   b. **`dog`**
   c. **`ls: *: No such file or directory`**
   d. **`*`**
   e. **`bash: 1>/dev/null: command not found`**
9. How many arguments does the shell pass to this **`echo`** command:
   `echo " one ’2 three’ 4 "five 6 ’ 7 "8 ’ >out`
   a. **`2`** *b.* **`6`** *c.* **`5`** *d.* **`4`** *e.* **`3`**
10. What is contained in file **`c`** after this command line:
    `echo foo >a ; ln a b ; echo bar >>b ; ln a c ; rm a`
    a. no such file (nonexistent) *b.* **`bar`**
    c. **`foo`** *d.* **`foo`** followed by **`bar`**
    e. nothing (empty file)
11. Which command line shows the file in **`/bin`** with the largest checksum?
    a. **`sum /bin | sort -nr | head -1`**
    b. **`cat /bin | sum | sort -nr | head -1`**
    c. **`ls /bin/* | sum | sort -nr | head -1`**
    d. **`sum /bin/* | sort -nr | head -1`**
    e. **`cat /bin/* | sum | sort -nr | head -1`**
12. Which of these statements is true?
    a. To make a hard link to file "**`foo`**" named "**`bar`**", file "**`foo`**" must exist.
    b. If you give me write permission on a file owned by you, I can then use **`chmod`** to change its permissions.
    c. You only need "**`r--`**" permission on directory "**`foo`**" for "**`ls -l foo`**" to work.
    d. You can make a hard link to a directory.
    e. The "**`ln`**" command takes two arguments, so the maximum number of hard links a file can have is two.

13. Which command line below outputs only lines 11-15 of the Unix password file?
    a. **tail -15 /etc/passwd | head -10**
    b. **head -10 /etc/passwd | tail -15 /etc/passwd**
    c. **head -15 /etc/passwd | tail -5 /etc/passwd**
    d. **head -15 /etc/passwd | tail -5**
    e. **tail -10 /etc/passwd | head -15 /etc/passwd**

14. If file **/a** contains 7 lines, and file **/b** contains 5 lines, then how many lines are in file **/c** after this command line:
    cat /a /b >/c ; sort /c >/c ; sort /c /a /b >/c
    a. **12** *b.* **5** *c.* **0** *d.* **24** *e.* **7**

15. What is the output on your screen after this command line:
    mkdir foo ; rmdir foo | wc -c
    a. **3** *b.* **1** *c.* no output
    d. **0** *e.* **4**

16. What is the output of this command line in an empty directory:
    touch 1 2 3 .a .b .c ; echo .??*
    a. **.??***
    b. **. .. .a .b .c**
    c. an error message from **echo** saying **.??*** does not exist
    d. **.a .b .c**
    e. **. .. 1 2 3 .a .b .c**

17. What is the output on your screen of this command line:
    echo pig >one ; echo cow | head -2 one
    a. **cow** followed by **pig** *b.* an error message
    c. **pig** followed by **cow** *d.* **pig**
    e. **cow**

18. Which command line shows the current date?
    a. **bash date** *b.* **bash >date ; cat date**
    c. **echo date | bash** *d.* **date | bash**
    e. **bash <date**

19. Which of the following will *not* cause **file1** to become an empty file?
    a. **tail file1 > file1** *b.* **sort file1 > file1**
    c. **wc file1 > file1** *d.* **cat file1 > file1**
    e. **head file1 > file1**

20. What is the output of this command line in an empty directory: **echo ***
    a. *****
    b. **. ..**
    c. no output on screen
    d. an error message from **echo** saying ***** does not exist
    e. **.**

21. What is the output on your screen after these command lines:
    echo one >x ; cp x y ; echo two >>y
    sort x >y ; cat y
    a. **one** *b.* **one** followed by **two**
    c. no output *d.* **two**
    e. **two** followed by **one**

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

23. How many arguments are passed to the command by the shell on this command line: **<bar bar -b"-a '-r' >bar" bar >out**
    a. **2** *b.* **5** *c.* **6** *d.* **3** *e.* **4**

24. Which of the following VI/VIM key sequences will move the entire line on which the cursor resides to after the line that follows it (i.e. it would move line 5 to be line 6 and line 6 would become line 5)?
    a. **:dp** *b.* **ddp** *c.* **DDP** *d.* **ddP** *e.* **DDp**

25. Which command line shows just the count of lines in the file?
    a. **wc file | awk '{print #1}'**
    b. **wc file | awk '[print #1]'**
    c. **wc file | awk '{print 1}'**
    d. **wc file | awk '{print $1}'**
    e. **wc file | awk '[print $1]'**

26. What is the output on your screen after these command lines:
    echo 1 >x ; cp x y ; echo 2 >>y
    sort x >y ; cat y
    a. **1** followed by **2** *b.* **2** *c.* **1**
    d. **2** followed by **1** *e.* no output

27. Given an existing file of yours named **foo**, what is the output on your screen of this command line: **echo hi >foo ; sort foo >foo ; wc foo**
    a. no output *b.* **0 0 0 foo** *c.* **1 1 3 foo**
    d. **2 2 4 foo** *e.* **1 1 2 foo**

28. Which command below removes *only* this five-character file name containing a special character (and no others): **yy?yy**
    a. **rm yy/?yy** *b.* **rm yy\\?yy** *c.* **rm yy\?yy**
    d. **rm yy//?yy** *e.* **rm yy?yy**

29. What is the output of this command line in an empty directory: **cat ***
    a. **.**
    b. **. ..**
    c. *****
    d. an error message from **cat** saying ***** does not exist
    e. no output on screen

30. What command shows all the lines in file **foo** that contain the string **bar**?
a. **grep foo bar** *b.* **grep cat foo bar**
c. **grep bar >foo** *d.* **cat foo > grep bar**
e. **grep bar <foo**

31. How many lines are in file **out** after this command line:
echo hi >dog >out >cat
a. **0** *b.* **1** *c.* **3** *d.* **2** *e.* **4**

32. Which of the command lines below can generate a non-empty file?
a. **sort -r foo >foo** *b.* **tail -5 foo >foo**
c. **wc -wc foo >foo** *d.* **grep -v foo foo >foo**
e. **tr abc ABC <foo >foo**

33. If file **/a** contains 30 lines, and file **/b** contains 50 lines, then how many lines are in file **/c** after this command line:
cat /a /b >/c ; sort /c >/c ; sort /c /a /b >/c
a. **80** *b.* **50** *c.* **160** *d.* **0** *e.* **30**

34. Which of these statements is true?
a. Only single quotes are strong enough to stop glob (wildcard) patterns from expanding.
b. If **/x** is an empty directory, **sort /x/*** produces an error message.
c. Only double quotes are strong enough to stop glob (wildcard) patterns from expanding.
d. If **/y** is an empty directory, **echo /y/*** produces an error message.
e. Only backslashes are strong enough to stop glob (wildcard) patterns from expanding.

35. 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
```
a. **two** *b.* **two** followed by **one**
c. **one** followed by **two** *d.* no output
e. **one**

36. Which command line displays the contents of the Unix **passwd** file one page at a time?
a. **cat /etc/passwd >more** *b.* **more | /etc/passwd**
c. **more < /etc/passwd** *d.* **/etc/passwd >more**
e. **/etc/passwd | more**

37. Given an existing file of yours named **wc**, what is the output on your screen of this command line: **echo hi >wc ; sort wc >wc ; cat wc**
a. no output *b.* **1 1 2 wc** *c.* **1 1 3 wc**
d. **2 2 4 wc** *e.* **0 0 0 wc**

38. How many lines are in file **out** after this command line:
echo hi >dog >cat >out
a. **4** *b.* **0** *c.* **3** *d.* **2** *e.* **1**

39. Which of these command line will make **file3** contain all of the content of **file1** followed by all of the content of **file2**?
a. **echo file1 file2 >file3**
b. **ln file1 file2 >file3**
c. **cat file1 file2 >file3**
d. **mv file1 file2 >file3**
e. **cp file1 file2 >file3**

40. What is the output of this command line in an empty directory:
touch .a .b .c ; echo [.]*
a. an error message from **echo** saying **[.]*** does not exist
b. no output
c. **[.]***
d. **. .. .a .b .c**
e. **.a .b .c**

41. How many arguments does the shell pass to this **echo** command:
echo " 1 '2 3' 4 "5 6 ' 7 "8 ' >out
a. **2** *b.* **3** *c.* **5** *d.* **6** *e.* **4**

42. How many arguments does the shell pass to this **echo** command:
echo "cow "y " bat 'man x' " pig'a "hop' a b
a. **11** *b.* **5** *c.* **7** *d.* **4** *e.* **6**

43. 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
```
a. no output on screen *b.* **two**
c. **one** *d.* **ten**
e. **one** followed by **two** and **ten**

44. Which command line below outputs only lines 5-10 of the file named **foo**?
a. **tail -10 foo | head -6** *b.* **tail -15 foo | head -5**
c. **head -15 foo | tail -5** *d.* **head -5 foo | tail -10**
e. **head -10 foo | tail -6**

45. What is the output of this command line in an empty directory:
touch 1 .1 23 .23 456 ; echo [12]*
a. **1 23**
b. **1 .1 23 .23**
c. **1 .1 23 .23 456**
d. **[12]***
e. an error message from **echo** saying **[ab]*** does not exist

46. Which command line displays all the names in the current directory that are exactly three digits long (and no others)?
a. **echo [?][?][?]** *b.* **echo [3][3][3]**
c. **echo ???** *d.* **echo [0-9][0-9][0-9]**
e. **echo [1-3][1-3][1-3]**

47. Which command line displays all the non-hidden names in the current directory that contain the letter **x** (and no others)?
a. **echo *x*** *b.* **echo [x]** *c.* **echo x***
d. **echo *x** *e.* **echo ?x?**

48. What would you type to change the permissions on a file to **rw-r-xr--**?
a. **chmod 654 file** *b.* **chmod 351 file**
c. **chmod 212 file** *d.* **chmod 530 file**
e. **chmod 221 file**

49. Which command below removes only this file name containing a special character:
abc*
a. **rm abc*** *b.* **rm abc*** *c.* **rm abc***
d. **rm abc/*** *e.* **rm abc//***

50. In an empty directory, how many words are in file **cow** after this command line:
touch dog dog cat ; ls >cow
a. **1** *b.* **2** *c.* **0** *d.* **4** *e.* **3**

51. How many arguments does the shell pass to this **echo** command:
echo " 1 2 " three ’ 4 ’ five"6"
a. **3** *b.* **1** *c.* **9** *d.* **4** *e.* **5**

52. In an empty directory, how many words are in file **out** after this command line:
touch a ; ls >out
a. **3** *b.* **0** *c.* **2** *d.* **1** *e.* **4**

53. What is the output of this command line if run in an empty directory:
touch A a ; echo * >"*" ; ls
a. No output *b.* *** A a** *c.* **A a >A a**
d. *** >*** *e.* **A a >***

54. If file **ten** contains ten lines, and file **twenty** contains twenty lines, then how many lines are output on your screen by this command line:
cat twenty | sort ten
a. **0** *b.* **10** *c.* **20** *d.* **30** *e.* **60**

55. What is in the file **cow** after this command line:
echo a >b ; echo b >a ; mv b a >cow
a. no such file (nonexistent) *b.* nothing (empty file)
c. **a** followed by **b** *d.* **b**
e. **a**

56. Which command line tells you the recursive count of all pathnames under the current directory and all subdirectories?
a. **wc "$PWD"** *b.* **wc *** *c.* **find | wc**
d. **wc .** *e.* **ls | wc**

57. If file **foo** contains 9 lines, each of which is the one-digit line number of the line in the file (**1** through **9**), what is the output on your screen of this command:
sort foo foo | tail -4 | head -1
a. **4 4** *b.* **8** *c.* **6** *d.* **6 6** *e.* **1 1**

58. What is the output of this command line in an empty directory:
touch .a .b .c ; echo .??*
a. **.a .b .c**
b. no output
c. **.??***
d. **. .. .a .b .c**
e. an error message from **echo** saying **.??*** does not exist

59. What is the output on your screen of this command line:
umask 762 ; touch newfile ; ls -l newfile
a. **--------wx 1 me me 0 Oct 1 1:12 newfile**
b. **-------r-- 1 me me 0 Oct 1 1:12 newfile**
c. **-rwxrw--w- 1 me me 0 Oct 1 1:12 newfile**
d. **------xr-x 1 me me 0 Oct 1 1:12 newfile**
e. **-rw-rw--w- 1 me me 0 Oct 1 1:12 newfile**

60. What is the output on your screen of this command line:
echo cow >foo ; echo dog | head -1 foo
a. **cow** *b.* **foo**
c. **dog** *d.* **dog** followed by **cow**
e. **cow** followed by **dog**

61. In an empty directory, how many files are created by this command line:
touch a "b c" ’ ’ d e
a. **4** *b.* **3** *c.* **6** *d.* **7** *e.* **5**

62. How many arguments does the shell pass to this **echo** command:
echo ’It’s a bird! No! It’s a plane!’
a. **3** *b.* **4** *c.* **2** *d.* **5** *e.* **1**

63. In an empty directory, what is in file **out** after this command line:
ls nosuchfile | wc -l >out
a. nothing (empty file) *b.* **11**
c. **10** *d.* **0**
e. **1**

64. If file **/a** contains 40 lines, and file **/b** contains 60 lines, then how many lines are output on your screen by this command line:
sort /a /b | cat /a | cat /b
a. **60** *b.* **200** *c.* **160** *d.* **100** *e.* **40**

65. What is the output on your screen of this command line:
```
echo pig >one ; echo bat | tail one
```
a. an error message *b.* **pig** followed by **bat**
c. **bat** *d.* **bat** followed by **pig**
e. **pig**

66. Which of these command line will make file **foo** contain all of the content of file **a** followed by all of the content of file **b**?
a. `cat a >foo ; cat b >>foo`
b. `cp a >foo ; cp b >>foo`
c. `mv a b >foo`
d. `echo a b >foo`
e. `cp a b >foo`

67. How many lines are in the file **out** after this command line:
```
echo hi >x ; echo ho >>x ; cat x x x >out
```
a. **0** *b.* **3** *c.* **1** *d.* **2** *e.* **6**

68. What is the output of this command line in an empty directory:
```
touch .a .b .c ; echo .*
```
a. an error message from **echo** saying **.*** does not exist
b. no output
c. `. .. .a .b .c`
d. `.a .b .c`
e. `.*`

69. What is the output on your screen of this command line:
```
echo wc >wc ; wc wc >wc ; cat wc
```
a. **wc** *b.* **1 1 2 wc** *c.* no output
d. **1 1 3 wc** *e.* **0 0 0 wc**

70. What command shows all the lines in file **/etc/group** that contain the string **idallen**?
a. `grep idallen >/etc/group`
b. `cat /etc/group | wc idallen`
c. `grep idallen </etc/group`
d. `cat /etc/group > grep idallen`
e. `grep /etc/group idallen`

71. If directory **/a** contains these seven two-character file names: **aa**, **ab**, **ac**, **ad**, **a?**, **a***, **a.**, then which command below will remove only the single two-character name **a?** from the directory (and no others)?
a. **rm /a/a[*]** *b.* **rm /a/a\?** *c.* **rm /a/a?**
d. **rm /a?** *e.* **rm /a/a***

72. Which command below removes *only* this four-character file name containing a special character (and no others): **abc***
a. **rm abc//*** *b.* **rm abc*** *c.* **rm abc***
d. **rm abc/*** *e.* **rm abc***

73. In an empty directory, how many lines are in file **foo** after this command line:
```
ls nosuchfile . .. 2>foo
```
a. **3** *b.* **0** *c.* **1** *d.* **4** *e.* **2**

74. Which command pipeline outputs the count of the number of pathnames (including all subdirectories) that lie under the /etc directory?
a. **dir /etc | count** *b.* **find /etc | wc**
c. **man /etc ; wc** *d.* **ls /etc | wc**
e. **ls /etc ; wc**

75. What would you type to change the permissions on a file to **-wxr-x--x**?
a. **chmod 214 file** *b.* **chmod 321 file**
c. **chmod 311 file** *d.* **chmod 351 file**
e. **chmod 654 file**

76. How many arguments does the shell pass to this **echo** command:
```
echo 'It's a bird! It's a plane!'
```
a. **2** *b.* **1** *c.* **3** *d.* **5** *e.* **4**

77. What is the output on your screen after these command lines:
```
echo 1 >x ; ln x y ; echo 2 >y
chmod 077 y ; cat x
```
a. **1** followed by **2** *b.* **2**
c. an error message *d.* **1**
e. no output on screen

78. In an empty directory, how many words are in file **pig** after this command line:
```
touch pig pig ; ls >pig
```
a. **0** *b.* **4** *c.* **1** *d.* **3** *e.* **2**

79. What is in the file **x** after this command line:
```
echo foo >a ; rm b ; echo bar >>b ; cp a b >x
```
a. **bar** *b.* no such file (nonexistent)
c. **foo** *d.* **foo** followed by **bar**
e. nothing (empty file)

80. What is the output of this command line in an empty directory:
```
touch .12 .345 .6789 ; echo .??*
```
a. no output
b. an error message from **echo** saying **.??*** does not exist
c. `.??*`
d. `.12 .345 .6789`
e. `. .. .12 .345 .6789`

81. What is the correct syntax to redirect both standard output and standard error into the same output file?
a. **sum 2>1 >out foo** *b.* **sum foo 1>out 2>1**
c. **sum >out foo 2>&1** *d.* **sum 1>out 2>out foo**
e. **sum 2>&1 foo >out**

82. If directory **dir** contains these four three-character file names: **.aa**, **.ab**, **.a?**, **.a***, then what is the output on your screen of this command line:
```
echo dir/???
```
a. **dir/.aa dir/.ab**
b. **dir/???**
c. no output
d. **dir/.a?**
e. **dir/.aa dir/.ab dir/.a? dir/.a***

83. If file **foo** contains 99 lines, each of which is the two-digit line number of the line in the file (**01** through **99**), what is the output on your screen of this command:
```
sort -r foo foo | tail -4 | head -1
```
a. **02** *b.* **96** *c.* **96 96**
d. **98** *e.* **04 04**

84. How many arguments are passed to the command by the shell on this command line: **<cow cow "-x" -y '-z' >cow cow**
a. **2** *b.* **5** *c.* **4** *d.* **6** *e.* **3**

85. What is the output on your screen of this command line:
```
umask 457 ; mkdir newdir ; ls -ld newdir
```
a. **d-w--w---- 2 me me 512 Oct 1 1:12 newdir**
b. **dr--r-xrwx 2 me me 512 Oct 1 1:12 newdir**
c. **dr-xr-xrwx 2 me me 512 Oct 1 1:12 newdir**
d. **d-wx-w-rwx 2 me me 512 Oct 1 1:12 newdir**
e. **d-wx-w---- 2 me me 512 Oct 1 1:12 newdir**

86. In a directory containing one file named **dog**, what is the output on your screen after this command line: **2>/dev/null ls nosuchfile**
a. **ls: nosuchfile: No such file or directory**
b. **nosuchfile**
c. **bash: 2>/dev/null: command not found**
d. no output
e. **dog**

87. If the current directory contains 5 visible files and 10 visible sub-directories, what is the output on your screen of this command: **echo */.**
a. 5 file names *b.* 15 pathnames
c. ***/.** *d.* 10 directory names
e. no output

88. If directory **/a** contains these seven two-character file names: **aa**, **ab**, **ac**, **ad**, **a?**, **a***, **a.**, then which command below will remove only the single two-character name **a*** from the directory (and no others)?
a. **rm /a*** *b.* **rm /a/a*** *c.* **rm /a/a?**
d. **rm "/a/a*"** *e.* **rm /a/***

89. What will appear on your screen if you execute this sequence of commands in your home directory:
```
ln /etc/passwd foo ; ln foo bar
echo hi >bar ; cat bar
```
a. the conents of the password file followed by **hi**
b. an error message and then the contents of the password file
c. an error message and then **hi**
d. **bar**
e. **hi**

90. What is the output of this command line in an empty directory:
```
touch x .a .ab .cde .fghi ; echo .??*
```
a. **.ab .cde .fghi**
b. **. .. .a .ab .cde .fghi**
c. **.??***
d. **.cde .fghi**
e. an error message from **echo** saying **.??*** does not exist

91. What is the output on your screen of this command line:
```
umask 674 ; touch newfile ; ls -l newfile
```
a. **--w--wxr-x 1 me me 0 Feb 20 07:55 newfile**
b. **-rw-rw-r-- 1 me me 0 Feb 20 07:55 newfile**
c. **-rw-rwxr-- 1 me me 0 Feb 20 07:55 newfile**
d. **--------w- 1 me me 0 Feb 20 07:55 newfile**
e. **---x----wx 1 me me 0 Feb 20 07:55 newfile**

92. What is in the file named **file** after this command line:
```
echo a >c ; echo b >>c ; mv c d >file
```
a. no such file (nonexistent file) *b.* **a** followed by **b**
c. nothing (empty file) *d.* **a**
e. **b**

93. If file **/a** contains 30 lines, and file **/b** contains 50 lines, then how many lines are output on your screen by this command line: **cat /a | sort /b**
a. **30** *b.* **20** *c.* **50** *d.* **0** *e.* **80**

94. In an empty directory, what is the output on your screen after this command line:
```
ls out 2>/dev/null
```
a. **ls: out: No such file or directory**
b. no output
c. **out**
d. **ls: out 2>/dev/null: No such file or directory**
e. **ls: /dev/null: No such file or directory**

95. Which command below removes *only* this four-character file name containing a special character (and no others): ***xyz**
a. **rm ''*xyz** *b.* **rm *xyz** *c.* **rm ''*xyz''**
d. **rm *"xyz"** *e.* **rm "*xyz"**

96. What is the output on your screen of this command line:
```
echo bat >pig ; echo one | tail pig
```
a. an error message *b.* **bat**
c. **one** followed by **bat** *d.* **bat** followed by **one**
e. **one**

97. How many arguments are passed to the command by the shell on this command line: **<cow cow "-x "-y 'z' >cow cow**
a. **7** *b.* **5** *c.* **3** *d.* **4** *e.* **6**

98. If file **twenty** contains twenty lines, and file **thirty** contains thirty lines, then how many lines are output on your screen by this command line:
```
tail thirty | cat twenty
```
a. **20** *b.* **0** *c.* **30** *d.* **21** *e.* **50**

99. What is the output on your screen of this command line:
```
echo wc >wc ; wc wc >wc ; head wc
```
a. **1 1 3 wc** *b.* no output *c.* **wc**
d. **1 1 2 wc** *e.* **0 0 0 wc**

100. Which command line 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-x .**
b. **mkdir protected ; chmod 777 .**
c. **mkdir protected ; chmod 777 protected**
d. **mkdir protected ; chmod 333 protected**
e. **mkdir protected ; cd protected ; chmod go+wx .**

101. How many arguments does the shell pass to this **echo** command:
```
echo 'It's "1 2" isn't it? I can't decide.
```
a. **4** *b.* **5** *c.* **2** *d.* **6** *e.* **3**

102. If directory **cow** contains only these four three-character file names: **.AA**, **.A1**, **.BB**, **.B.**, then what is the output on your screen of this command line:
```
echo cow/*
```
a. **cow/.AA cow/.A1 cow/.BB cow/.B.**
b. **cow/.AA cow/.A1 cow/.BB**
c. **cow/.B.**
d. **cow/***
e. no output

103. How many lines are in the file **bar** after this command line:
```
echo hi >x ; echo ho >>x ; cat x >bar
```
a. **4** *b.* **1** *c.* **6** *d.* **0** *e.* **2**

104. If file **foo** contains 9 lines, each of which is the one-digit line number of the line in the file (**1** through **9**), what is the output on your screen of this command:
```
cat foo foo | sort | tail -4 | head -1
```
a. **1** *b.* no output *c.* **6**
d. **8** *e.* **4**

105. What is the output of this command line in an empty directory:
```
touch a .a bc .bc def ; echo [ab]*
```
a. **a bc**
b. **[ab]***
c. no output
d. an error message from **echo** saying **[ab]*** does not exist
e. **a .a bc .bc**

106. In an empty directory, how many arguments are passed to the **rm** command in this command line: **date >a1 ; touch a2 ba ca >all ; rm a***
a. **2** *b.* **4** *c.* none *d.* **1** *e.* **3**

107. What is the output on your screen of this command line:
```
echo cat >out ; echo dog | sort out
```
a. **cat** followed by **dog** *b.* **dog** followed by **cat**
c. **dog** *d.* **cat**
e. **out**

108. In an empty directory, how many arguments are passed to the **rm** command in this command line: **touch a a1 a2 ba ca ; rm a***
a. **2** *b.* none *c.* **3** *d.* **4** *e.* **1**

109. If directory **/a** contains these seven two-character file names: **aa**, **ab**, **ac**, **ad**, **a***, **a?**, **??**, then which command below will remove only the single two-character name **a?** from the directory (and no others)?
a. **rm /a/?\?** *b.* **rm /a\?** *c.* **rm '/a/a?'**
d. **rm "/a?"** *e.* **rm /a/a?**

110. Which of the following statements is true about this command line:
```
>foo file bar haven
```
a. The command **file** sees two arguments.
b. The command **foo** sees three arguments.
c. The command **foo** sees only two arguments
d. Error: The command name is missing from the command line.
e. The command **file** sees three arguments.

111. What is the output of this command line if run in an empty directory:
```
touch A a ; echo * ">*"
```
a. **A a >A a** *b.* **A a >*** *c.* *** >***
d. No output *e.* **A a**

112. In an empty directory, how many arguments are passed to the **cat** command in this command line: **touch a1 a2 ba ca ; cat a***
a. **1** *b.* **4** *c.* none *d.* **2** *e.* **3**

113. Which command below is the best way to find a line containing an asterisk (*****) in the file named **foo**?
a. **grep '*' foo** *b.* **grep foo [*]**
c. **grep ./* foo** *d.* **grep foo "*"**
e. **grep * foo**

114. If file **x** contains ten lines, and file **y** contains twenty lines, then how many lines are in file **cat** after this command line:

```
sort x y >z ; tail -5 x >x ; sort x y z >cat
```

a. **0** *b.* **60** *c.* **50** *d.* **55** *e.* **40**

115. If directory **dir** contains only these five two-character file names: **a?**, **11**, **?1**, **1***, **.1**, then which command below will remove *only* the single two-character name **?1** from the directory?

a. **rm dir/?1** *b.* **rm dir/??** *c.* **rm dir/\??**
d. **rm dir/*1** *e.* **rm dir/1***

116. What would you type to change the permissions on a file to **rw-r--r--**?

a. **chmod 644 file** *b.* **chmod 244 file**
c. **chmod 344 file** *d.* **chmod 211 file**
e. **chmod 311 file**

117. Which of these statements is true?

a. you can only remove a file name if the file is writable by you
b. you can change the permissions of any file to which you can write
c. you may be able to rename a file even if you do not own the file
d. you can only remove a file name if the file is owned by you
e. you can only make links to files owned by you

118. Which command counts the number of Unix permission groups you are in?

a. **umask | wc** *b.* **wc groups**
c. **id | wc** *d.* **groups | wc**
e. **echo groups | wc**

119. If directory **/a** contains these seven two-character file names: **aa**, **ab**, **ac**, **ad**, **a?**, **a***, **a.**, then which command below will remove only the single two-character name **a*** from the directory (and no others)?

a. **rm /a*** *b.* **rm /a/a*** *c.* **rm /a/***
d. **rm /a/a*** *e.* **rm /a/a?**

120. What is the output on your screen of this command line:

```
echo hi >hi ; head hi >hi ; wc hi
```

a. no output *b.* **2 2 4 hi** *c.* **1 1 3 hi**
d. **1 1 2 hi** *e.* **0 0 0 hi**

121. Which command below removes only this file name containing a special character:

```
?xyz
```

a. **rm '?xyz'** *b.* **rm ''?xyz** *c.* **rm ?xyz**
d. **rm ''?xyz''** *e.* **rm ?'xyz'**

122. If file **/a** contains 20 lines, and file **/b** contains 30 lines, then how many lines are in file **/c** after this command line:

```
sort /a /b >/c ; cat /a >>/b ; sort /c /b /a >/c
```

a. **120** *b.* **50** *c.* **80** *d.* **70** *e.* **0**

123. What is the output on your screen after this command line:

```
echo hi >ls ; cat ls > wc
```

a. **1 1 3** *b.* no output on screen
c. **1 1 2** *d.* **hi**
e. **ls**

124. What is the output of this command line in an empty directory: **ls ***

a. an error message from **ls** saying ***** does not exist
b. *****
c. **. ..**
d. **.**
e. no output on screen

125. Given my directory **dir** and my file **dir/c** owned by me, which permissions allow me to access and change or create new content (data) in the file **dir/c** but not delete the file?

a. Permissions **100** on directory **dir** and **200** on file **dir/c**.
b. Permissions **600** on directory **dir** and **700** on file **dir/c**.
c. Permissions **100** on directory **dir** and **100** on file **dir/c**.
d. Permissions **200** on directory **dir** and **200** on file **dir/c**.
e. Permissions **400** on directory **dir** and **400** on file **dir/c**.

126. What is in the file **bar** after this command line:

```
echo hi >x ; echo ho >x ; mv x y >bar
```

a. nothing (empty file) *b.* **hi** followed by **ho**
c. **ho** *d.* **hi**
e. no such file (nonexistent)

127. If file **foo** contains 99 lines, each of which is the two-digit line number of the line in the file (**01** through **99**), what is the output on your screen of this command:

```
sort foo foo | tail -4 | head -1
```

a. **96 96** *b.* **98** *c.* **04 04**
d. **01 01** *e.* **96**

128. In an empty directory, how many lines are in file **out** after this command line:

```
ls . .. nosuchfile 2>out
```

a. **0** *b.* **2** *c.* **3** *d.* **4** *e.* **1**

129. If file **x** contains ten lines, and file **y** contains twenty lines, then how many lines are in file **cat** after this command line:

```
sort x y >z ; tail -5 y >y ; sort x y z >cat
```

a. **45** *b.* **40** *c.* **60** *d.* **0** *e.* **50**

130. In an empty directory, what is in file **count** after this command line:

```
ls ??? | wc -w >count
```

a. **1 1 2** *b.* **1**
c. nothing (empty file) *d.* **0**
e. **1 1 1**

131. Which of the following statements is true about this command line:
```
<dir/c cat dir/d
```
a. The command is always invalid.
b. The command **cat** sees only one argument.
c. The command **cat** sees two arguments.
d. The command **dir/c** sees two arguments.
e. The command **dir/c** sees only one argument

132. What is the output on your screen after these command lines:
```
echo 1 >a ; ln a b ; echo 2 >b
chmod 266 b ; cat a
```
a. **1** *b.* an error message
c. **1** followed by **2** *d.* no output on screen
e. **2**

133. Which command below sorts *only* this five-character file name containing a special character (and no others): **xx?xx**
a. `sort ""xx?xx""` *b.* `sort xx/?xx`
c. `sort "xx?xx"` *d.* `sort ''xx?xx''`
e. `sort xx?xx`

134. What would you type to change the permissions on a file to **--x-wx-w-**?
a. `chmod 322 file` *b.* `chmod 122 file`
c. `chmod 121 file` *d.* `chmod 132 file`
e. `chmod 654 file`

135. How many arguments does the shell pass to this **echo** command:
```
echo " 1 2 "three ' 4 ' five"6"
```
a. **3** *b.* **1** *c.* **4** *d.* **5** *e.* **9**

136. How many arguments does the shell pass to this **echo** command:
```
echo 'And it's not hard, it's just logical.'
```
a. **4** *b.* **3** *c.* **5** *d.* **6** *e.* **7**

137. What is the output on your screen of this command line:
```
umask 574 ; mkdir newdir ; ls -ld newdir
```
a. `dr-xrwxr-- 1 me me 0 Oct 1 07:55 newdir`
b. `d-w-----wx 1 me me 0 Oct 1 07:55 newdir`
c. `d-w-----w- 1 me me 0 Oct 1 07:55 newdir`
d. `d-w-rwx-wx 1 me me 0 Oct 1 07:55 newdir`
e. `dr--rw-r-- 1 me me 0 Oct 1 07:55 newdir`

138. Which command below removes *only* this four-character file name containing a special character (and no others): ***xyz**
a. `rm *'xyz'` *b.* `rm ''*xyz` *c.* `rm ''*xyz''`
d. `rm *xyz` *e.* `rm '*xyz'`

139. Given my directory **dir** and my file **dir/bar** owned by me, which permissions allow me to delete the file **dir/bar** from the directory, but not change the content (data) in the file?
a. Permissions **100** on directory **dir** and **500** on file **dir/bar**.
b. Permissions **500** on directory **dir** and **500** on file **dir/bar**.
c. Permissions **300** on directory **dir** and **200** on file **dir/bar**.
d. Permissions **100** on directory **dir** and **300** on file **dir/bar**.
e. Permissions **300** on directory **dir** and **400** on file **dir/bar**.

140. Which command line displays the contents of the Unix **passwd** file one page at a time?
a. `/etc/passwd >less` *b.* `less </etc/passwd`
c. `/etc/passwd | less` *d.* `less | /etc/passwd`
e. `cat /etc/passwd >less`

141. In an empty directory, what is the output on your screen after this command line:
```
touch a ; ls >wc -l
```
a. **2** *b.* **3** *c.* **0**
d. no output *e.* **1**

142. If file **/a** contains 3 lines, and file **/b** contains 5 lines, then how many lines are output on your screen by this command line: `cat /a | sort /b`
a. **2** *b.* **8** *c.* **0** *d.* **3** *e.* **5**

143. Which of the following command lines removes all the names in the current directory that are exactly three letters (alphabetic) long (and nothing else)?
a. `rm [3][3][3]`
b. `rm [azAZ][azAZ][azAZ]`
c. `rm ???`
d. `rm [a-zA-Z,a-zA-Z,a-zA-Z]`
e. `rm [a-zA-Z][a-zA-Z][a-zA-Z]`

144. What is in file **out** after this command line: `echo a >out b c`
a. nothing (empty file) *b.* **b c**
c. **echo a** *d.* **a**
e. **a b c**

145. What is the output on your screen of this command line:
```
umask 162 ; touch newfile ; ls -l newfile
```
a. `-rw---x-w- 1 me me 0 Oct 1 01:12 newfile`
b. `---xrw--w- 1 me me 0 Oct 1 01:12 newfile`
c. `-rw----r-- 1 me me 0 Oct 1 01:12 newfile`
d. `-rw---xr-x 1 me me 0 Oct 1 01:12 newfile`
e. `----rw--w- 1 me me 0 Oct 1 01:12 newfile`

146. Which command below removes *only* this four-character file name containing a special character (and no others): ***dog**
a. `rm .\/*dog` *b.* `rm /*dog` *c.* `rm ?dog`
d. `rm ./\*dog` *e.* `rm \\*dog`

147. In an empty directory, how many arguments are passed to the **cat** command in this command line: **touch a1 a2 ac ba .a ; cat a***
a. none *b.* **4** *c.* **2** *d.* **1** *e.* **3**

148. Which of the command lines below can generate a non-empty file?
a. **sort -r foo >foo** *b.* **grep -v foo foo >foo**
c. **tail -5 foo >foo** *d.* **tr abc ABC <foo >foo**
e. **ls foo >foo**

149. Which of the command lines below can generate a non-empty file?
a. **head -5 foo >foo** *b.* **sort foo >foo**
c. **tail foo >foo** *d.* **wc -l foo >foo**
e. **cat foo foo foo >foo**

150. What is the output on your screen after this command line:
echo hi >a ; cp a b | wc -c
a. **1** *b.* **0** *c.* **3**
d. no output *e.* **2**

151. Given my directory **dir** and my file **dir/foo** owned by me, which permissions allow me to access and change or create new content (data) in the file **dir/foo** but not delete the file?
a. Permissions **500** on directory **dir** and **600** on file **dir/foo**.
b. Permissions **300** on directory **dir** and **200** on file **dir/foo**.
c. Permissions **100** on directory **dir** and **100** on file **dir/foo**.
d. Permissions **600** on directory **dir** and **700** on file **dir/foo**.
e. Permissions **400** on directory **dir** and **400** on file **dir/foo**.

152. Which command below removes *only* this four-character file name containing a special character (and no others): **?abc**
a. **rm /?abc** *b.* **rm "?abc"** *c.* **rm ""?abc""**
d. **rm ''?abc''** *e.* **rm -r ?abc**

153. In an empty directory, how many arguments are passed to the **cat** command in this command line: **date >a1 ; touch a2 ba ca ; cat a***
a. **2** *b.* **1** *c.* **3** *d.* **4** *e.* none

154. In an empty directory, how many words are in file **out** after this command line:
touch 1 2 3 2 1 ; ls >out
a. **4** *b.* **3** *c.* **6** *d.* **0** *e.* **5**

155. In an empty directory, what is the output on your screen after this command line:
touch a ; ls | wc -l
a. **0** *b.* **1** *c.* **3**
d. no output *e.* **2**

156. Given my directory **dir** and my file **dir/c** owned by me, which permissions allow me to delete the file **dir/c** from the directory, but not change the content (data) in the file?
a. Permissions **500** on directory **dir** and **400** on file **dir/c**.
b. Permissions **300** on directory **dir** and **500** on file **dir/c**.
c. Permissions **100** on directory **dir** and **200** on file **dir/c**.
d. Permissions **300** on directory **dir** and **300** on file **dir/c**.
e. Permissions **100** on directory **dir** and **100** on file **dir/c**.

157. What is the output on your screen after this command line:
echo xx >z ; ls z > wc
a. **2** *b.* no output *c.* **1 1 3**
d. **1 1 2** *e.* **3**

158. In an empty directory, how many arguments are passed to the **wc** command in this command line: **date >o1 ; touch a1 b2 out >o1 ; wc o***
a. **4** *b.* **3** *c.* **1** *d.* **5** *e.* **2**

159. What is the output on your screen after this command line:
echo 1 >x ; ln x y ; echo 2 >>y ; sort x
a. **1** *b.* **1** followed by **2** *c.* no output
d. **2** *e.* **2** followed by **1**

160. If file **a** contains 20 lines, and file **b** contains 30 lines, then how many lines are in file **out** after this command line:
cat a b >c ; head c >c ; sort a b c >out
a. **30** *b.* **60** *c.* **50** *d.* **100** *e.* **0**

161. Which command pipeline outputs the count of the number of manual page titles that contain the keyword "sort"?
a. **wc man sort** *b.* **wc -k sort**
c. **man sort ; wc** *d.* **man -k sort | wc**
e. **man sort | wc**

162. Which of these commands makes a file owned by me, also executable by me?
a. **chmod u+x ./myfile** *b.* **umask 777 myfile**
c. **chmod x=u ./myfile** *d.* **chmod x+u myfile**
e. **umask 111 myfile**

163. What would you type to change the permissions on a file to **r-----rw-**?
a. **chmod 322 file** *b.* **chmod 654 file**
c. **chmod 122 file** *d.* **chmod 102 file**
e. **chmod 406 file**

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

165. How many arguments are passed to the command by the shell on this command line: `<bat bat -b "-a -r" >bat bat bat`
a. `5` *b.* `4` *c.* `6` *d.* `3` *e.* `7`

166. If file `/a` contains 3 lines, and file `/b` contains 5 lines, then how many lines are in file `/c` after this command line:
```
cat /a /b >/c ; sort /c >/c ; sort /c /a /b >/c
```
a. `5` *b.* `16` *c.* `3` *d.* `0` *e.* `8`

167. What is the output on your screen after this command line:
```
echo hi >a ; ls a > wc
```
a. `3` *b.* `2` *c.* `1  1  3`
d. no output *e.* `1  1  2`

168. Which of these commands makes a file owned by me, also readable by me?
a. `umask 300 ./myfile` *b.* `chmod r+u myfile`
c. `umask 400 myfile` *d.* `chmod u+r ./myfile`
e. `chmod r=u ./myfile`

169. What is the output on your screen of this command line:
```
echo wc >wc ; wc wc >wc ; sort wc
```
a. `wc` *b.* `1 1 2 wc` *c.* no output
d. `1 1 3 wc` *e.* `0 0 0 wc`

170. In an empty directory, what is the output on your screen after this command line:
```
ls 2>/dev/null nosuchfile
```
a. `ls: /dev/null: No such file or directory`
b. `ls: nosuchfile: No such file or directory`
c. no output
d. `ls: 2>/dev/null nosuchfile: No such file or directory`
e. `nosuchfile`

171. Which command line outputs inode/filename pairs for names in the current directory, sorted by inode number?
a. `ls -i * > sort -n` *b.* `ls -ai | sort -n`
c. `sort -n | ls -ai` *d.* `ls ./* | sort -node`
e. `ls -node * > sort -n`

172. What is the output on your screen of this command line:
```
umask 475 ; mkdir newdir ; ls -ld newdir
```
a. `d-wxrwx-w- 2 it it 400 Jul 3 8:00 newdir`
b. `d-wx----w- 2 it it 400 Jul 3 8:00 newdir`
c. `dr-xrwxr-x 2 it it 400 Jul 3 8:00 newdir`
d. `dr--rwxr-x 2 it it 400 Jul 3 8:00 newdir`
e. `d-w-----w- 2 it it 400 Jul 3 8:00 newdir`

173. Which command below removes *only* this four-character file name containing a special character (and no others): `cat?`
a. `rm \cat?` *b.* `rm cat/?` *c.* `rm ""cat?""`
d. `rm "cat?"` *e.* `rm ''cat?''`

174. What is in the file `out` after this command line:
```
echo hi >x ; echo ho >>x ; cp x y >out
```
a. nothing (empty file) *b.* `hi`
c. `ho` *d.* `hi` followed by `ho`
e. no such file (nonexistent)

175. In an empty directory, what is the output on your screen after this command line:
```
ls nosuchfile 2>out
```
a. `nosuchfile not found` *b.* no output
c. `nosuchfile` *d.* `2 not found`
e. `nosuchfile 2 not found`

176. 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
```
a. `one` *b.* `one` followed by `ten` and `two`
c. `ten` *d.* `two`
e. no output on screen

177. What is the output on your screen of this command line:
```
umask 547 ; mkdir newdir ; ls -ld newdir
```
a. `dr--r--rw- 1 me me 0 Feb 20 07:55 newdir`
b. `d-w--w---- 1 me me 0 Feb 20 07:55 newdir`
c. `d-w--wxrwx 1 me me 0 Feb 20 07:55 newdir`
d. `dr-xr--rwx 1 me me 0 Feb 20 07:55 newdir`
e. `d-w--wx--- 1 me me 0 Feb 20 07:55 newdir`

178. How many arguments are passed to the command by the shell on this command line: `<bar bar -b "-a" '-r' >bar bar bar`
a. `7` *b.* `5` *c.* `4` *d.* `3` *e.* `6`

179. If directory `dir` contains these three four-character file names: `.123`, `.124`, `.???`, then what is the output on your screen of this command line:
```
echo dir/????
```
a. `echo: dir/????: No such file or directory`
b. `dir/.123 dir/.124`
c. `dir/????`
d. `dir/.123 dir/.124 dir/.???`
e. no output

180. How many lines are in the file `bar` after this command line:
```
echo hi >x ; echo ho >>x ; cat x x >bar
```
a. `2` *b.* `6` *c.* `1` *d.* `4` *e.* `0`

181. Which command below is the best way to find a line containing an asterisk (`*`) in the file named `foo`?
a. `grep * foo` *b.* `grep foo "*"`
c. `grep '*' <foo` *d.* `grep <foo [*]`
e. `grep ./* foo`

182. If file **foo** contains 9 lines, each of which is the one-digit line number of the line in the file (**1** through **9**), what is the output on your screen of this command:
```
cat foo foo | sort -r | head -4 | tail -1
```
a. **8** *b.* **7** *c.* **9** *d.* **5** *e.* **6**

183. Which of the command lines below can generate a non-empty file?
a. **head -1 file >file**
b. **sort -r file file >file**
c. **touch file >file**
d. **ls -ls file >file**
e. **grep pattern file >file**

184. Which of the following statements is true about this command line:
```
>dir/c cat dir/d
```
a. The command **dir/c** sees only one argument
b. The command **cat** sees only one argument.
c. The command **cat** sees two arguments.
d. The command is always invalid.
e. The command **dir/c** sees two arguments.

185. If file **twenty** contains twenty lines, and file **thirty** contains thirty lines then how many lines are output on your screen by this command line:
```
tail twenty | cat thirty
```
a. **20** *b.* **50** *c.* **0** *d.* **40** *e.* **30**

186. What is the possible output on your screen of this command line:
```
echo wc >date ; sort date >date ; cat date
```
a. **1 6 28 date**
b. no output on screen
c. **1 6 29 date**
d. **Fri Mar 16 12:00:00 EST 2012**
e. **wc**

187. How many arguments are passed to the command by the shell on this command line: **<pig pig -x " " -z -r" " >pig pig pig**
a. **8** *b.* **6** *c.* **5** *d.* **7** *e.* **9**

188. Which command below is the best way to find a line containing a question mark (**?**) in the file **/etc/passwd**?
a. **grep ./? /etc/passwd** *b.* **grep '?' /etc/passwd**
c. **grep ? >/etc/passwd** *d.* **grep ? /etc/passwd**
e. **grep /etc/passwd ./?**

189. How many arguments does the shell pass to this **echo** command:
```
echo ' one two ' three ' four ' 5'6'
```
a. **5** *b.* **1** *c.* **4** *d.* **6** *e.* **9**

190. How many arguments does the shell pass to this **echo** command:
```
echo one two three >four five
```
a. **5** *b.* **3** *c.* **6** *d.* **4** *e.* **2**

191. What is the output of this command line in an empty directory:
```
touch 1 2 3 .a .ab .abc ; echo [.]*
```
a. an error message from **echo** saying **[.]*** does not exist
b. **.a .ab .abc**
c. no output
d. **[.]***
e. **. .. .a .ab .abc**

192. Which of the command lines below can generate a non-empty file?
a. **cat foo >foo** *b.* **sort -r foo >foo**
c. **tail -5 foo >foo** *d.* **ls -i foo >foo**
e. **grep foo foo >foo**

193. Which command line outputs inode/filename pairs for names in the current directory, sorted by inode number?
a. **ls -a | sort -i** *b.* **sort -n | ls -ai**
c. **ls -i -a | sort -n** *d.* **sort ls -ia**
e. **ls -ia > sort -n**

194. Which command below removes *only* this four-character file name containing a special character (and no others): **xyz?**
a. **rm xyz\?** *b.* **rm -r xyz?** *c.* **rm xyz//?**
d. **rm xyz/?** *e.* **rm xyz\\?**

195. What is the output on your screen after this command line:
```
echo one >x ; ln x y ; echo two >>y ; sort x
```
a. **two** *b.* no output
c. **one** followed by **two** *d.* **one**
e. **two** followed by **one**

196. What is the output on your screen after these command lines:
```
echo 1 >x ; ln x y ; echo 2 >>y
head -1 x >y ; cat y
```
a. **1** followed by **2** *b.* no output *c.* **2**
d. **2** followed by **1** *e.* **1**

197. Given this successful command line (note the dot argument):
```
cd /home/foo ; mkdir bar ; cd bar ; chmod -x .
```
Which of the following subsequent commands will execute without any "permission denied" errors?
a. **ls /home/foo/bar** *b.* **ls /home/foo/bar/..**
c. **ls /home/foo/bar/.** *d.* **ls .**
e. **ls ..**

198. What is true about this command line: **`date >ls ; ls -ls ls >wc`**
   a. The **`ls`** command receives the output of **`date`** on standard input.
   b. The shell finds and executes three different commands.
   c. The file **`wc`** has one line in it.
   d. The **`ls`** command is executed more than once.
   e. The **`wc`** command counts the output of the **`ls`** command.

199. If file **`foo`** contains 9 lines, each of which is the one-digit line number of the line in the file (**`1`** through **`9`**), what is the output on your screen of this command:
```
sort foo foo | tail -5 | head -1
```
   a. **`9`** *b.* **`7`** *c.* **`1 1`** *d.* **`1`** *e.* **`5 5`**

200. If file **`foo`** contains 9 lines, each of which is the one-digit line number of the line in the file (**`1`** through **`9`**), what is the output on your screen of this command:
```
cat foo foo | sort | uniq | tail -4 | head -1
```
   a. **`6`** *b.* **`4`** *c.* **`5`** *d.* **`1`** *e.* **`6 6`**

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