PRINT Name: _____ **LAB Section:** | | | |

Test Version: 210 **One-Answer Multiple Choice** **324 Questions − 35 of 35%**

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

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1. Given the following, can user **kirk** in group **starfleet** modify **./file1**?
```
dr-xr--r-x 2 root starfleet 4096 Oct 7 14:00 .
-rw-rw-r-- 1 kirk starfleet 123  Oct 4 14:05 file1
```
a. No, because the directory is not accessible to **kirk**
b. No, because **kirk** has no write permission on the directory
c. No, because execute permissions are not set for **kirk** on **file1**
d. Yes, because **kirk** has write permissions on **file1**
e. Yes, because **kirk** owns **file1**

2. 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 -3 | head -1
```
a. **2 2** *b.* **1** *c.* **8 8** *d.* **8** *e.* **9**

3. On a disk with seven partitions, give the correct partition names after you delete partition **sda2**:
a. **sda1 sda2 sda3 sda4 sda6 sda7**
b. **sda1 sda2 sda3 sda4 sda5 sda6**
c. **sda1 sda2 sda3 sda4 sda6**
d. **sda1 sda2 sda3 sda4 sda5**
e. **sda1 sda3 sda4 sda5 sda6 sda7**

4. Given the following, can user **kirk** in group **starfleet** copy **./file1** to **file2**?
```
drwxr-xrwx 2 root starfleet 4096 Oct 7 14:00 .
-r-xr-xr-x 1 kirk starfleet 123  Oct 4 14:05 file1
```
a. Yes, because **kirk** has read permissions on **file1**
b. No, because the directory has no write permissions for **kirk**
c. Yes, because **kirk** owns **file1**
d. No, because the directory is not accessible to **kirk**
e. No, because **file1** has no write permissions for **kirk**

5. What is in file **out** after this command line: **echo 1 2 >out 3 4**
a. nothing (empty file) *b.* **echo 1 2**
c. **1 2 3 4** *d.* **1 2**
e. **3 4**

6. Which option to **ls** displays the directory itself and not its contents?
a. **-a** *b.* **-R** *c.* **-i** *d.* **-l** *e.* **-d**

7. If **sub** is a sub-directory that contains only the file **foo**, what happens after this command: **mv sub/foo sub/././bar**
a. the command fails because the name **bar** does not exist
b. there is a second copy of the file **foo** in the file named **bar**
c. the directory **sub** now contains only a file named **bar**
d. the command fails because the name **sub/././bar** does not exist
e. the directory **sub** is now empty

8. 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. **two** followed by **one**
b. **one** followed by **two**
c. **bash: /bin/foo: command not found**
d. **one**
e. **two**

9. Pick the correct order of operations:
a. **mkswap, fdisk, swapon** *b.* **mkswap, swapon, fdisk**
c. **swapon, fdisk, mkswap** *d.* **fdisk, mkswap, swapon**
e. **swapon, mkswap, fdisk**

10. What is the output on your screen after this command line:
```
mkdir dir ; touch dir/.aa dir/.bb ; echo dir/*
```
a. **dir/. dir/.. dir/.aa dir/.bb**
b. **dir/***
c. **dir/.aa dir/.bb**
d. **dir/**
e. no output on screen

11. 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**
a. **bash: foo: command not found**
b. **hi**
c. **mom**
d. **mom** followed by **hi**
e. **hi** followed by **mom**

12. What is usually contained in the environment variable **$SHELL**?
    a. the absolute path of the system **/shell** directory
    b. the absolute path of your login shell
    c. the relative path of your login shell
    d. the relative path of the system **/shell** directory
    e. the relative path of the **/home/shell** directory

13. Which signal cannot be caught or ignored by a process and causes an immediate process end?
    a. **KILL** *b.* **END** *c.* **TERM** *d.* **HUP** *e.* **STOP**

14. If file **foo** contains 3 lines, and file **bar** contains 4 lines, then how many lines are output on your screen by this command line: **cat foo | echo bar**
    a. **3** *b.* **3** followed by **1** *c.* **1**
    d. **4** *e.* **3** followed by **4**

15. 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. **/foo** *b.* **/bar/foo** *c.* **/etc/foo/bar**
    d. **/etc/foo** *e.* **/etc/bar/foo**

16. If **foo** is a sub-directory that contains only the file **bar**, what happens after this command: **mv ./foo/bar foo/../moo**
    a. the command fails because the name **foo/../moo** does not exist
    b. the command fails because the name **moo** does not exist
    c. there is a second copy of the file **bar** in the file named **moo**
    d. the directory **foo** now contains only a file named **moo**
    e. the directory **foo** is now empty

17. If my current directory is **/bin**, which of these pathnames is equivalent to the file name **/bin/rm**?
    a. **./bin/rm** *b.* **../../bin/./rm**
    c. **/root/bin/rm** *d.* **rm/.**
    e. **../bin/rm/.**

18. What GRUB line do you modify to boot a machine single-user?
    a. **boot** *b.* **title** *c.* **kernel**
    d. **grub** *e.* **initrd**

19. Which is the best choice for an extended partition size that will hold exactly three 100MB logical partitions?
    a. 320MB *b.* 400MB *c.* 300MB
    d. 290MB *e.* 100MB

20. How does system logging work under Unix/Linux?
    a. processes copy logs from your **$HOME** directory to the **/var/spool** directory
    b. processes write log entries directly into the system log directory
    c. processes send messages to a central **syslog** program that writes log files
    d. processes send messages to the **init** process that inherits orphan processes
    e. processes write log files into each user's **$HOME** directory

21. Which command correctly mounts a first disk partition on directory *dir*?
    a. **mount /mnt/sda1** *dir*
    b. **mount -t ext3 /mnt/sda1** *dir*
    c. **mount -t ext2** *dir* **/dev/sda1**
    d. **mount** *dir* **/dev/sda1**
    e. **mount /dev/sda1** *dir*

22. What command will recursively find all pathnames (anywhere) owned by UID 99:
    a. **find / -user 99** *b.* **ls -name 99 /**
    c. **usermod -name 99 /** *d.* **grep -name 99 /**
    e. **ls -R 99 /**

23. Which of these is a likely kernel version number?
    a. **#1 SMP Sat Nov 7 21:25:57 EST 2009**
    b. **Linux**
    c. **83 Linux**
    d. **139285**
    e. **2.6.31.5-127.fc12.i686.PAE**

24. What command sets group administrator users?
    a. **passwd** *b.* **usermod** *c.* **groupedit**
    d. **modgroup** *e.* **gpasswd**

25. To bring a background shell job into the foreground, type:
    a. **kill %1** *b.* **[Ctrl-D]** *c.* **fg**
    d. **bg** *e.* **[Ctrl-Z]**

26. Under what directory are system log files usually stored?
    a. **/grub/boot/** *b.* **/boot/grub** *c.* **/log/var/**
    d. **/etc/log/** *e.* **/var/log/**

27. 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** followed by **foo**
    b. **foo**
    c. **foo** followed by **hi**
    d. **hi**
    e. **bash: prg: command not found**

28. On a disk with eight partitions, give the correct partition names after you delete partition **sda2**:
    a. **sda1 sda2 sda3 sda4 sda5 sda6**
    b. **sda1 sda3 sda4 sda5 sda6 sda7 sda8**
    c. **sda1 sda2 sda3 sda4 sda5 sda7 sda8**
    d. **sda1 sda2 sda3 sda4 sda6 sda7 sda8**
    e. **sda1 sda2 sda3 sda4 sda5 sda6 sda7**

29. Which command can unmount a single mounted file system?
a. **unmount** *b.* **swapoff** *c.* **chkconfig**
d. **umount** *e.* **telinit**

30. 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
```
a. **5** *b.* **2** *c.* **1** *d.* **4** *e.* **3**

31. What command shows all partition names and System IDs on the fifth disk:
a. **fdisk -l /dev/sde** *b.* **mkfs -l /dev/sd5e**
c. **mount -l /dev/sd5e** *d.* **find -l /dev/sde**
e. **find -l /dev/sd5**

32. What syntax puts a command into the "background"?
a. **command #** *b.* **command @** *c.* **command &**
d. **command $** *e.* **command %**

33. What is usually contained in the environment variable **$HOME**?
a. the relative path of the ROOT directory
b. the absolute path of the system **/home** directory
c. the relative path of your login home directory
d. the absolute path of your login home directory
e. the relative path of the system **/home** directory

34. What is in file **foo** after this command line:
```
echo hi >a ; ln a b ; echo me >b ; ln a foo ; rm a b
```
a. nothing (empty file) *b.* **hi** followed by **me**
c. no such file (nonexistent) *d.* **me**
e. **hi**

35. Given user **foo** in group **foo** and user **bar** in group **bar**, which command line enables a file to be read by both **foo** and **bar**:
a. chown foo:bar file ; chmod 077 file
b. chown foo:foo file ; chmod bar:bar file
c. chown foo file ; chown bar file ; chmod 440 file
d. chown bar file ; chown foo file ; chmod 333 file
e. chown foo:bar file ; chmod 440 file

36. What is true about this output from **ls -il foo bar**
```
23 -rwxrwxrwx 2 bin bin 3 Jul 31 12:33 foo
99 -rwxrwxrwx 2 bin bin 3 Jul 31 12:33 bar
```
a. **foo** and **bar** each have three names (six names total)
b. this output is not possible
c. **foo** and **bar** are names for different files
d. **foo** and **bar** are names for the same file
e. **foo** and **bar** are two of three names for the same file

37. 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
```
a. **0** *b.* **2** *c.* **3** *d.* **1** *e.* **4**

38. If file **a** contains 2 lines, and file **b** contains 3 lines, then how many lines are output on your screen by this command line: **sort a | head b**
a. **2** *b.* **0** *c.* no output
d. **5** *e.* **3**

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

40. File **a** contains 2 lines. File **b** contains 3 lines. How many lines are in file **e** after this command line:
```
ln a d ; cp a f ; ln d c ; ln c e ; cat a b d f > e
```
a. 9 *b.* 2 *c.* 5 *d.* 6 *e.* 3

41. What is true about this output from **ls -il foo bar**
```
99 -r-x------ 2 bin bin 3 Jul 31 12:33 foo
99 -r-x------ 2 bin bin 3 Jul 31 12:33 bar
```
a. **foo** and **bar** are names for the same file
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 different files
e. **foo** and **bar** each have three names (six names total)

42. Which command line below allows programs in the current directory to execute without preceding the names with **./**?
a. **$PATH=.:$HOME:/usr/bin** *b.* **PATH=/usr/bin:.:/bin**
c. **PATH=./$HOME:/usr/bin** *d.* **PATH=/usr/bin/.:$HOME**
e. **$PATH=/usr/bin:./bin**

43. What is true about this output from **ls -il foo bar**
```
15 -r-x------ 2 bin bin 3 Jul 31 12:33 foo
99 -r-x------ 2 bin bin 3 Jul 31 12:33 bar
```
a. this output is not possible
b. **foo** and **bar** are two of three names for the same file
c. **foo** and **bar** each have three names (six names total)
d. **foo** and **bar** are names for different files
e. **foo** and **bar** are names for the same file

44. 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. **bar**
b. **/bin/cat: pig: No such file or directory**
c. **bash: /bin/cat: command not found**
d. **pig**
e. no output on screen

45. What is the link count of directory **z** after this set of successful commands?
```
mkdir z ; cd z ; touch a b ; mkdir c d e
```
a. 5 *b.* 3 *c.* 4 *d.* 7 *e.* 6

46. In an empty directory, how many words are in file **b** after this:
```
echo 1 2 3 >a ; ls >b
```
a. 1 *b.* 5 *c.* 2 *d.* 4 *e.* 3

47. What command will show the type of file system inside an unmounted *partition*?
a. **mount | grep '***partition***'** *b.* **file** *partition*
c. **fdisk -s** *partition* *d.* **file -s** *partition*
e. **fdisk -l** *partition*

48. What is the purpose of a "swap" partition?
a. to keep user home directories
b. to store extra files when the ROOT disk gets full
c. to run programs larger than the available memory
d. to keep a back-up copy of user home directories
e. to allow swapping a new disk for one with bad sectors

49. 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/bar/dir/foo** *b.* **/bin/dir/foo**
c. **/bin/dir/foo/bar** *d.* **/bar/../dir/foo**
e. **/dir/foo**

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

51. 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. **/bin/ls: bat: No such file or directory**
b. **bat**
c. **foo**
d. no output on screen
e. **bash: /bin/ls: command not found**

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

53. If the file **pig** 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 pig
```
a. **/bin/ls: pig: No such file or directory**
b. **bash: /bin/ls: command not found**
c. **pig**
d. **foo**
e. no output on screen

54. The **minimum** permissions you need to remove a file from a directory are:
a. **wx** permissions on the directory, no permissions on the file
b. **wx** permissions on the directory and **w** permissions on the file
c. **w** permissions on the directory and **w** permissions on the file
d. **x** permissions on the directory and **w** permissions on the file
e. **w** permissions on the directory, no permissions on the file

55. The shadow password file is used:
a. to reduce the size of the main password file for faster access
b. to keep a back-up of the main password file in case of corruption
c. to store secondary passwords for times when you forget your main one
d. to hide encrypted passwords from viewing by ordinary users
e. to allow passwords to exist on partitions other than the ROOT

56. The **minimum** permissions you need to rename a file in a directory are:
a. **w** permissions on the directory, no permissions on the file
b. **x** permissions on the directory and **w** permissions on the file
c. **w** permissions on the directory and **w** permissions on the file
d. **wx** permissions on the directory and **w** permissions on the file
e. **wx** permissions on the directory, no permissions on the file

57. Which command line does a full log-in as the root user?
a. **root --login** *b.* **su --login**
c. **login -root** *d.* **su login=root**
e. **login --root**

58. What GRUB line do you modify to boot a machine single-user?
a. **initrd** *b.* **kernel** *c.* **grub**
d. **boot** *e.* **timeout**

59. 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'**

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

61. Who can change the permissions of the following directory?
    dr-xrwxrwx 17 foo bar 4096 Apr 15 16:40 .
    a. anyone except user **foo**
    b. only users in group **bar**
    c. user **foo** and any user in group **bar**
    d. only user **foo**
    e. any users

62. What command line would create a file system on the second *logical* partition?
    a. **fdisk /dev/sda6** *b.* **fdisk /dev/sda2**
    c. **mkfs /dev/sda6** *d.* **mkfs /dev/sda2**
    e. **mount /dev/sda2**

63. GRUB boot menu entries are a paragraph of several lines. The keyword on the first line of the paragraph is always:
    a. **initrd** *b.* **boot** *c.* **kernel**
    d. **timeout** *e.* **title**

64. Which of these is the Unix/Linux device name of your third disk?
    a. **sd3** *b.* **hd0,3** *c.* **hd2**
    d. **sdc** *e.* **sda3**

65. What command finds files by name quickly using a database?
    a. **find** *b.* **wget** *c.* **locate**
    d. **ls** *e.* **grep**

66. In an empty directory, what is the output on your screen after this command line:
    date >.foo >.bar ; ls *
    a. no output
    b. *****
    c. an error message from **ls** saying ***** does not exist
    d. **. .. .foo .bar**
    e. **.foo .bar**

67. What command will show lines containing the name **root** inside all four account files under **/etc**:
    a. **fdisk -l 'root' /etc/{passwd,shadow,group,gpasswd}**
    b. **du 'root' /etc/{passwd,shadow,group,gpasswd}**
    c. **find 'root' /etc/{passwd,shadow,group,gpasswd}**
    d. **grep 'root' /etc/{passwd,shadow,group,gpasswd}**
    e. **ls 'root' /etc/{passwd,shadow,group,gpasswd}**

68. What command will change permissions on a directory to make the names in it readable by group members, but prevent group access to anything in the directory. Do not change any other permissions.
    a. **umask 030** *dir* *b.* **umask 040** *dir* *c.* **chmod g=r** *dir*
    d. **chmod 040** *dir* *e.* **chown g=r** *dir*

69. Given the following, can user **bird** in group **sesame** modify **./foo**?
    dr-xr--r-x 2 root sesame 4096 Oct 7 14:00 .
    -rw-rw-r-- 1 bird sesame 123 Oct 4 14:05 foo
    a. No, because execute permissions are not set for **bird** on **foo**
    b. No, because **bird** has no write permission on the directory
    c. Yes; permissions don't apply because **bird** owns **foo**
    d. Yes, because **bird** has write permissions on **foo**
    e. No, because the directory is not accessible to **bird**

70. When a user named **foo** runs a command in a **setuid** executable file owned by **bar**, in a directory owned by **root**, the file executes with the permissions of:
    a. **foo** *b.* **bar** *c.* **root and bar**
    d. **root** *e.* **root and foo**

71. 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=/bin/foo:/usr/bin/foo:/usr ; foo**
    a. **mom**
    b. **dad**
    c. **mom** followed by **dad**
    d. **dad** followed by **mom**
    e. **bash: foo: command not found**

72. If the file **foo** contained the word **mom**, what would be the output on your screen of this two command sequence:
    PATH=/etc/passwd:/bin/ls:/bin/cat ; /bin/ls foo
    a. **bash: /bin/ls: command not found**
    b. **/bin/ls: foo: No such file or directory**
    c. **mom**
    d. **foo**
    e. no output on screen

73. Pick the correct order of operations:
    a. **fdisk, mkfs, mount** *b.* **mount, mkfs, fdisk**
    c. **mount, fdisk, mkfs** *d.* **mkfs, fdisk, mount**
    e. **fdisk, mount, mkfs**

74. To change the owner of a file to **me**, type:
    a. **chown me file** *b.* **umask :me file**
    c. **chown :me file** *d.* **newuser me file**
    e. **newuser file me**

75. Given the following, can user **bird** in group **sesame** copy **./foo** to **bar**?
```
drwx-wx--x 2 root sesame 4096 Oct 7 14:00 .
--wxrwxrwx 1 bird sesame 123  Oct 4 14:05 foo
```
a. No, because the directory has no write permissions for **bird**
b. No, because **foo** has no read permissions for **bird**
c. Yes, because **bird** has write permissions on **foo**
d. No, because the directory is not readable by **bird**
e. Yes; permissions don't apply because **bird** owns **foo**

76. Given the following, can user **bird** in group **sesame** modify **./foo**?
```
dr-xr-xr-x 2 root sesame 4096 Oct 7 14:00 .
-rw-r-xr-x 1 bird sesame 123  Oct 4 14:05 foo
```
a. No, because **bird** has no write permission on the directory
b. Yes, because **bird** has write permissions on **foo**
c. No, because the directory is not accessible to **bird**
d. No, because execute permissions are not set for **bird** on **foo**
e. Yes; permissions don't apply because **bird** owns **foo**

77. If file **a** contains 2 lines, and file **b** contains 3 lines, then how many lines are in file **c** after this command line:
```
cat a b >c ; cat a >>b ; sort c b >c a
```
a. **7** *b.* **0** *c.* **5** *d.* **12** *e.* **8**

78. If your **PATH** variable contains **/bin:/usr/bin**, what is the output of this command line: **echo '$PATH'**
a. **echo: $PATH: No such file or directory**
b. **/bin:/usr/bin**
c. **'/bin:/usr/bin'**
d. **'$PATH'**
e. **$PATH**

79. In an empty directory, what is the output on your screen after this command line:
```
touch .foo .bar ; ls *
```
a. **.foo .bar**
b. no output on screen
c. **. .. .foo .bar**
d. *****
e. an error message from **ls** saying ***** does not exist

80. 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. **/dir/bar** *b.* **/bin/dir/bar/foo**
c. **/bin/foo/dir/bar** *d.* **/foo/dir/bar**
e. **/bin/dir/bar**

81. 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"**

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

83. Which command mounts a disk partition on directory **foo**?
a. **mount /dev/sda1 /mnt/foo**
b. **mount /mnt/foo /dev/sda1**
c. **mount /mnt/sda1 /foo/dev**
d. **mount /mnt/sda1 /dev/foo**
e. **mount /dev/foo /mnt/sda1**

84. 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. **2** *b.* **5** *c.* **3** *d.* **1** *e.* **4**

85. What is a Unix/Linux "hidden" file name?
a. contains a period (dot ".") *b.* ends with a period (dot ".")
c. has permissions **000** *d.* begins with a period (dot ".")
e. has permissions **777**

86. If you delete an account with **userdel**, does it delete the user's home directory?
a. not enough information to answer
b. **userdel** cannot delete home directories
c. no, unless the home directory is under **/home**
d. yes, if you use a special option
e. yes, only if the home directory is under **/home**

87. Name three types of partitions:
a. primary, enhanced, linear *b.* primary, enhanced, logical
c. primary, extended, logical *d.* primary, extended, linear
e. basic, extended, logical

88. 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. **1** *b.* **2** *c.* **5** *d.* **4** *e.* **3**

89. Given the following, can user **ian** in group **iangrp** append to **foobar**?
```
drwxrw-rwx 2 root iangrp 4096 Apr 23 11:30 .
-rw-rw-r-- 1  ian iangrp 1024 Apr 23 11:30 foobar
```
a. Yes, because **ian** owns **foobar**
b. Unable to determine based on the information presented
c. Yes, because **ian** has write permissions on **foobar**
d. No, because the directory is not accessible to **ian**
e. No, because execute permissions are not set for **ian** on **foobar**

90. Which command line displays the mounted **/home** file system?
a. **mount | grep '/home'** *b.* **mount /home | grep**
c. **grep '/home' mount** *d.* **grep mount '/home'**
e. **grep '/home' | mount**

91. Which command line makes pathnames **/usr/local/bin** and **/usr/bin** lead to the same directory?
a. **ln -s . /usr/local** *b.* **ln . /usr/local**
c. **mkdir /usr/local** *d.* **rmdir /usr/local**
e. **touch /usr/local**

92. 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. 6 *b.* 18 *c.* 10 *d.* 21 *e.* 2

93. What command line modifies and moves (in one command line) the home directory **foo** to **bar** for the existing user **bob**?
a. **usermod -d -m /home/bob bar**
b. **usermod -dm /home/bar bob**
c. **usermod -m -d /home/bar bob**
d. **usermod -d -m /home/bar bob**
e. **usermod -m -d /home/foo /home/bar**

94. If you use **ls -l** on a file owned by a deleted user, the user/owner field is:
a. the name **"deleted"**
b. the number zero
c. a number instead of an account name
d. an account name in parentheses, e.g. **(luke)**
e. the name **"removed"**

95. What is in file **foo** after this command line: **echo 1 2 >foo 3 4**
a. **echo 1 2** *b.* **1 2**
c. nothing (empty file) *d.* **3 4**
e. **1 2 3 4**

96. 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** followed by **dad**
b. **dad** followed by **mom**
c. **mom**
d. **bash: /bin/foo: command not found**
e. **dad**

97. What option keyword do you add in GRUB to boot a machine single-user?
a. **single** *b.* **boot** *c.* **initrd**
d. **rhgb** *e.* **kernel**

98. 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
a. **cat: /etc/passwd: command not found**
b. **cat: bash: no such file or directory**
c. **bash: cat: command not found**
d. **bash: /bin/cat: no such file or directory**
e. **bash: /bin/sh: command not found**

99. The *difference* between the system (**root**) crontab and all the user (personal) crontabs is:
a. the personal crontab has the date and time in it
b. the personal crontab only runs commands once
c. the system crontab has the date and time in it
d. the system crontab also has the userid in it
e. the personal crontab also has the userid in it

100. If **dir** is a sub-directory that contains only the file **bar**, what happens after this command: **mv dir/bar dir/foo**
a. an empty file named **foo** is created
b. there is a second copy of the file **bar** in the file named **foo**
c. there is only the file named **foo** in the directory now
d. the command fails because the name **foo** does not exist
e. the command fails because **bar** is not a directory

101. What command line shows only your own processes, not all processes?
a. **crontab** *b.* **showall** *c.* **dmesg**
d. **ps lxww** *e.* **psmine**

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

103. Under what directory are system log files usually stored?
a. **/etc/log** *b.* **/grub/boot** *c.* **/var/log**
d. **/log/var** *e.* **/boot/grub**

104. What type and permissions result from this command line:
```
umask 362 ; touch newfile ; ls -l newfile
```
a. `--wx---r--` *b.* `-r-----r--` *c.* `-r----xr-x`
d. `--wxr-x-w-` *e.* `--wxrw--w-`

105. If my current working directory is **`/bin`**, which command copies the passwd file into existing directory **`/bin/dir`** under the name **`bar`**?
a. **`cp ./../etc/passwd ../dir/bar`**
b. **`cp ../../etc/./passwd /dir/bar`**
c. **`cp dir/../../etc/passwd ./dir/bar`**
d. **`cp ../bin/./dir/../etc/passwd ./dir/./bar`**
e. **`cp ./../dir/../etc/passwd ../bin/dir/bar`**

106. Rewrite **`/home/me/../you/../../etc/../home/me/../you/../me/../foo`** as a simplified absolute path:
a. **`/foo`** *b.* **`/home/me/foo`**
c. **`/home/you/foo`** *d.* **`/home/foo`**
e. **`/etc/foo`**

107. What command changes a user's password?
a. **`mkpasswd`** *b.* **`password`** *c.* **`chsh`**
d. **`chpasswd`** *e.* **`passwd`**

108. In an empty directory, how many words are in file **`c`** after this:
```
touch a ; echo 1 2 3 >b ; ls >c
```
a. 2 *b.* 1 *c.* 4 *d.* 5 *e.* 3

109. Which is a list of signals in increasing order of strength?
a. **`TERM KILL HUP`** *b.* **`HUP TERM KILL`**
c. **`HUP KILL TERM`** *d.* **`KILL HUP TERM`**
e. **`TERM HUP KILL`**

110. What is true about this output from **`ls -il foo bar`**
```
23 -r-x------ 2 bin bin 3 Jul 31 12:33 foo
23 -r-x------ 2 bin bin 3 Jul 31 12:33 bar
```
a. this output is not possible
b. **`foo`** and **`bar`** are two of three names for the same file
c. **`foo`** and **`bar`** are names for the same file
d. **`foo`** and **`bar`** each have three names (six names total)
e. **`foo`** and **`bar`** are names for different files

111. A Unix/Linux "tarball" is:
a. a single-file that contains individual uncompressed files
b. a single compressed file containing one uncompressed file
c. a single-file that contains individual compressed files
d. a multi-file directory containing individual compressed files
e. a multi-file directory containing individual uncompressed files

112. What command will recursively show disk usage in directories?
a. **`ls`** *b.* **`fdisk`** *c.* **`find`**
d. **`df`** *e.* **`du`**

113. Regarding the **`-t type`** option, e.g. **`-t ext3`**:
a. you can usually omit the type when using **`mount`**
b. you must give the type when using **`fdisk`**
c. you can usually omit the type when using **`mkfs`**
d. you must give the type when using **`swapon`**
e. you must give the type when using **`mkswap`**

114. Which one of these names is usually a shell environment variable?
a. **`FooBar`** *b.* **`foobar`** *c.* **`FOOBAR`**
d. **`fooBar`** *e.* **`Foobar`**

115. If my current working directory is **`/mnt`**, which command copies the group file into existing directory **`/mnt/xxx`** under the name **`yyy`**?
a. **`cp ./xxx/../etc/group ../mnt/xxx/yyy`**
b. **`cp xxx/../../etc/group ./xxx/yyy`**
c. **`cp ../../etc/./group /xxx/yyy`**
d. **`cp ../mnt/./xxx/../etc/group ./xxx/./yyy`**
e. **`cp ./../etc/group ../xxx/yyy`**

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

117. If I have a directory named **`a/b`**, which action would increase its *link count* by exactly one?
a. create a directory named **`a/b2`**
b. create a hard link to directory **`b`** named **`b2`**
c. create a file named **`a/b/c`**
d. create a file named **`a/b2`**
e. create a directory named **`a/b/c`**

118. What command creates an **`ext3`** file system on the third partition of the first disk?
a. **`mkfs ext3 /dev/sd3a`** *b.* **`mkfs -t ext3 /dev/sda3`**
c. **`mkfs -t /dev/sd1c`** *d.* **`mkfs ext3 /dev/sda3`**
e. **`mkfs -t /dev/sda3 ext3`**

119. If file **`nine`** 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 nine nine | tail -n 5 | head -n 1
```
a. **`7`** *b.* **`8`** *c.* **`5`** *d.* **`9`** *e.* **`5 5`**

120. 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**
   a. **mom**
   b. **bash: foo: command not found**
   c. **mom** followed by **dad**
   d. **dad** followed by **mom**
   e. **dad**

121. 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. **foo** followed by **hi**
   b. **hi** followed by **foo**
   c. **foo**
   d. **hi**
   e. **bash: pig: command not found**

122. Which file contains a list of file systems to mount when booting the system?
   a. **/var/spool** *b.* **/etc/init.d**
   c. **/etc/fstab** *d.* **/var/log**
   e. **/etc/grub.conf**

123. In an empty directory, what permissions are on file **???** after these commands:
touch ??? * ; chmod 111 ***
chmod 222 ? ; chmod 444 '*'
   a. **-w--w--w-** *b.* **rw-rw-rw-** *c.* **r--r--r--**
   d. **-wx-wx-wx** *e.* **--x--x--x**

124. How many arguments are passed to the command by the shell:
<f z " a 'b c' d " 1 2 ' g " h " ' >z
   a. **6** *b.* **5** *c.* **4** *d.* **3** *e.* **2**

125. Given this **ls -il** long listing:
123 drwxr-xr-x 456 bin bin 789 Jul 31 12:33 dir
How many subdirectories lie immediately under **dir**?
   a. **123** *b.* **789** *c.* **454** *d.* **456** *e.* **787**

126. Rewrite
/usr/./bin/../lib/../../etc/../usr/./lib/../bin/./bar
as a simplified absolute path:
   a. **/usr/bar** *b.* **/bar** *c.* **/usr/bin/bar**
   d. **/usr/lib/bar** *e.* **/etc/bar**

127. When the shell exits, what happens to background jobs of the shell?
   a. they keep running
   b. they are stopped
   c. they exit
   d. they are made into foreground jobs
   e. they are sent a termination signal

128. In an empty directory, what is the output on your screen after this command line:
echo hi >.out ; echo .*
   a. **hi**
   b. **.out**
   c. **.***
   d. **. .. .out**
   e. an error message from **echo** saying **.*** does not exist

129. Which **fdisk** internal command letter displays the list of all partitions?
   a. **l** *b.* **L** *c.* **f** *d.* **q** *e.* **p**

130. When **fdisk** shows a partition size of 12345678 blocks, approximately how big is it?
   a. **12 MB** *b.* **1.2 GB** *c.* **12 TB**
   d. **1.2 TB** *e.* **12 GB**

131. To "throw away" (hide) standard error output of a command, use:
   a. **cmd 1>/dev/sda1** *b.* **cmd 2>/dev/null**
   c. **cmd 2>/dev/sda1** *d.* **cmd 1>&2**
   e. **cmd 2>&1**

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

133. If file **a** contains 3 lines, and file **b** contains 2 lines, then how many lines are output on your screen by this command line: **cat b | cat a**
   a. **5** *b.* **3** followed by **2** *c.* **2**
   d. **2** followed by **3** *e.* **3**

134. 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**
   b. **foo** followed by **bar**
   c. **bar**
   d. **bar** followed by **foo**
   e. **bash: bat: command not found**

135. What is contained in the **/etc/fstab** file?
   a. a list of file system tables used to identify partition types
   b. a list of file systems to mount when booting the system
   c. a list of file system tables used by the adduser command
   d. a list of file system tables used by the usermod command
   e. a list of currently mounted file systems

136. Which of the following is true, given this long directory listing:
```
drwxr-x--x 712 bin bin 512 Jul 31 12:33 dir
```
   a. The number 712 is the count of links (names) this directory has.
   b. The number 512 is the count of links (names) this directory has.
   c. The number 512 is the inode number of this directory.
   d. The number 712 is the inode number of this directory.
   e. The number 712 is the size of this directory.

137. Pick the correct order of operations:
   a. **swapon, mkswap, fdisk** *b.* **swapon, fdisk, mkswap**
   c. **fdisk, mkswap, swapon** *d.* **fdisk, swapon, mkswap**
   e. **mkswap, fdisk, swapon**

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

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

140. 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. **/bar** *b.* **/foo/bar** *c.* **/bin/bar**
   d. **/bin/foo/bar** *e.* **/bin/bar/foo**

141. What command line shows you all the partition names on *disk*?
   a. **file -s** *disk* *b.* **find /** *disk* *c.* **du** *disk*
   d. **fdisk -l** *disk* *e.* **df** *disk*

142. 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**
   a. **two** followed by **one**
   b. **one** followed by **two**
   c. **one**
   d. **two**
   e. **bash: xxx: command not found**

143. If file **foo** contains 3 lines, and file **bar** contains 4 lines, then how many lines are output on your screen by this command line: **head foo | tail bar**
   a. **3** followed by **4** *b.* **4** followed by **3** *c.* **3**
   d. **4** *e.* **5**

144. Given the following, can user **bird** in group **sesame** rename **./foo** to **bar**?
```
d----wx--- 2 root sesame 4096 Oct 7 14:00 .
---------- 1 bird sesame 123  Oct 4 14:05 foo
```
   a. No, because **bird** has no permissions on **foo**
   b. No, because the directory has no permissions for other users
   c. Yes, because **bird**'s group matches the group writable directory
   d. No, because **bird** cannot read the directory
   e. Yes; permissions don't apply because **bird** owns **foo**

145. If **/bin/ls** is a file name, which pathname always leads to the same file?
   a. **/bin/../../ls** *b.* **/.././bin/./ls**
   c. **/bin/ls/../..** *d.* **././bin/ls**
   e. **/bin/ls/./.**

146. What is the link count of file **foo** after this set of 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. 2 *b.* 5 *c.* 4 *d.* 3 *e.* 1

147. If I mount **sda1** on **/one** and **sda2** on **/two,** how can I link the existing file **/one/foo** to the new pathname **/two/bar**?
   a. **ln -s /one/foo /two/bar**
   b. **ln /one/bar /two/foo**
   c. **ln -s /two/bar /one/foo**
   d. **ln /two/bar /one/foo**
   e. **ln /one/foo /two/bar**

148. Under what directory are system configuration files usually stored?
   a. **/boot/grub** *b.* **/etc** *c.* **/var/log/**
   d. **/log/var/** *e.* **/grub/boot/**

149. If file **a** occupies one disk block, how many disk blocks are in use after this sequence of commands: **cp a b ; ln b c ; cp c d ; ln c e**
   a. 1 block *b.* 4 blocks *c.* 2 blocks
   d. 5 blocks *e.* 3 blocks

150. The signal sent to a foreground process by typing the **[Ctrl-C]** key is:
   a. **SIGINT** *b.* **SIGHUP** *c.* **SIGTERM**
   d. **SIGSTOP** *e.* **SIGKILL**

151. 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 -3 | head -1
```
   a. **1** *b.* **3** *c.* **7 7** *d.* **7** *e.* **8**

152. Other than root, who can change the permissions of the following directory?
```
dr-xrwxrwx 17 ian iangrp 4096 Apr 15 16:40 .
```
a. only user **ian**
b. only root can change the permissions
c. anyone except user **ian**
d. user **ian** and any user in group **iangrp**
e. only users in group **iangrp**

153. Which of the following is true, given this long directory listing:
```
drwxr-x--x 512 bin bin 712 Jul 31 12:33 dir
```
a. The number 512 is the count of links (names) this directory has.
b. The number 712 is the inode number of this directory.
c. The number 512 is the inode number of this directory.
d. The number 512 is the size of this directory.
e. The number 712 is the count of links (names) this directory has.

154. Which of these commands makes a file owned by me, also executable by me?
a. **umask 100 f** *b.* **chmod x=u f** *c.* **umask 700 f**
d. **chmod u+x f** *e.* **chmod x+u f**

155. Given the following, can user **kirk** in group **starfleet** copy **./file1** to **file2**?
```
drwx-wx--x 2 root starfleet 4096 Oct 7 14:00 .
--wxrwxrwx 1 kirk starfleet 123  Oct 4 14:05 file1
```
a. Yes, because **kirk** has write permissions on **file1**
b. No, because the directory is not readable by **kirk**
c. Yes, because **kirk** owns **file1**
d. No, because the directory has no write permissions for **kirk**
e. No, because **file1** has no read permissions for **kirk**

156. 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**
a. **two** followed by **one**
b. **one**
c. **bash: /bin/xxx: command not found**
d. **one** followed by **two**
e. **two**

157. Fedora 12 has **/boot** on its own, separate, first partition. Which of these is the correct GRUB legacy path to its config file?
a. **(hd0,0)/grub.conf**
b. **(hd0,0)/boot/grub/grub.conf**
c. **(hd0,0)/grub/grub.conf**
d. **(hd0,1)/grub.conf**
e. **(hd0,1)/boot/grub/grub.conf**

158. If you are in **/etc** and **ls -l** shows a symbolic link **bar -> dir/foo** then dereference the absolute path of **bar** with no symbolic links:
a. **/bar/dir/foo** *b.* **/etc/dir/foo**
c. **/etc/dir/foo/bar** *d.* **/etc/bar/dir/foo**
e. **/dir/foo**

159. Given the following, can user **kirk** in group **starfleet** copy **./file1** to **file2**?
```
drwxrw-r-x 2 root starfleet 4096 Oct 7 14:00 .
-rwx-wx-wx 1 kirk starfleet 123  Oct 4 14:05 file1
```
a. No, because the directory is not accessible to **kirk**
b. Yes, because **kirk** owns **file1**
c. No, because **file1** has no read permissions for **kirk**
d. No, because the directory has no write permissions for others
e. Yes, because **kirk** has write permissions on **file1**

160. If I am in my home directory named **/home/me** and **mt** is an empty sub-directory, what is true after this command line:
```
touch ../me/foo ; cp ./mt/../foo ./mt/../bar
```
a. the command fails because the path **./mt/../foo** does not exist
b. the directory **mt** is still empty
c. there is a second copy of the file named **foo** in the file **bar**
d. the directory **mt** now has a file named **bar** in it
e. the directory **mt** now contains two files

161. What command line shows all processes by all users?
a. **jobs** *b.* **psall** *c.* **ps laxww**
d. **jobs -l** *e.* **showall**

162. What is the output on your screen of 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. **$cow**
e. the file names **1** through **8**, surrounded by quotes

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

164. A "dangling symlink" is a symlink:
a. to a directory *b.* to a special device file
c. to a non-existent target *d.* to a parent directory
e. to the current directory

165. Which of these is a Linux/Unix DOS-style **primary** partition name?
a. **sda7** *b.* **sdb4** *c.* **sda5** *d.* **sdb5** *e.* **sda6**

166. What is a Unix/Linux "tarball"?
   a. a single-file that contains individual uncompressed files
   b. a single-file that contains individual compressed files
   c. a single compressed file containing one uncompressed file
   d. a multi-file directory containing individual uncompressed files
   e. a multi-file directory containing individual compressed files

167. If I am in directory named **/home/me** and **mt** is an empty sub-directory, what is true after this command line:
```
touch ../me/foo ; cp ./mt/../foo ./mt/../bar
```
   a. the directory **mt** now contains two files
   b. the directory **mt** is still empty
   c. the command fails because the path **./mt/../foo** does not exist
   d. the file named **foo** is now renamed to **bar**
   e. the directory **mt** now has a file named **bar** in it

168. To change to the parent directory, do this:
   a. **cd .** *b.* **cd ..** *c.* **pwd ..**
   d. **pwd** *e.* **cd**

169. What command will show the amount of free disk space in a partition?
   a. **find** *b.* **df** *c.* **mount**
   d. **fdisk** *e.* **ls**

170. Rewrite **/var/./a/../../var/b/../../etc/./bar/../foo** as a simplified absolute path:
   a. **/etc/bar/foo** *b.* **/var/b/foo** *c.* **/var/foo**
   d. **/var/a/foo** *e.* **/etc/foo**

171. If I have a directory named **foo/bar**, which action would increase its *link count* by exactly one?
   a. create a file named **foo/cat**
   b. create a directory named **foo/bar/9**
   c. create a directory named **foo/pig**
   d. create a hard link to directory **bar** named **pig**
   e. create a file named **foo/bar/dog**

172. If you want a user-defined alias in all your **bash** shells, what do you do?
   a. put the alias into the **/etc/passwd** file for next log in
   b. define the alias in my file **$HOME/.bashrc**
   c. put the alias into the **/etc/group** file for next log in
   d. put the alias into the **grub.conf** file for next log in
   e. create the alias and then type "save" to save it to all shells

173. What command sends signals to processes using their process numbers?
   a. **kill** *b.* **telinit** *c.* **signal**
   d. **chkconfig** *e.* **init**

174. File **a** contains 2 lines. File **b** contains 3 lines. How many lines are in file **a** (not in **c**) after this command line:
```
ln a d ; ln d c ; ln c e ; cat a b c d e >c
```
   a. 9 *b.* 11 *c.* 2 *d.* 3 *e.* 5

175. The password **:x:** in **/etc/passwd** means:
   a. the password is locked
   b. the encrypted password is **"x"**
   c. the unencrypted password is stored in the group file
   d. the encrypted password is stored in the shadow file
   e. the account is locked

176. 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. **bash: foo: command not found**
   b. **two** followed by **one**
   c. **two**
   d. **one**
   e. **one** followed by **two**

177. How many arguments are passed to the command by the shell on this command line: **<foo foo " a 'b c' d " e ' f " g " ' >foo h**
   a. **2** *b.* **6** *c.* **4** *d.* **3** *e.* **5**

178. Pick the correct order of operations:
   a. MBR, POST, BIOS, O/S boot *b.* BIOS, POST, MBR, O/S boot
   c. POST, BIOS, MBR, O/S boot *d.* POST, MBR, BIOS, O/S boot
   e. BIOS, MBR, POST, O/S boot

179. What command will recursively find all pathnames in your home directory named **foo**:
   a. **grep 'foo' "$HOME"**
   b. **find "$HOME" -name 'foo'**
   c. **du 'foo' "$HOME"**
   d. **grep -user 'foo' "$HOME"**
   e. **ls -R 'foo' "$HOME"**

180. How do you execute the program **foo** in the current directory?
   a. **/foo** *b.* **$HOME/foo** *c.* **foo/**
   d. **./foo** *e.* **foo/.**

181. What does password **:x:** mean in **/etc/passwd**?
   a. the account is locked
   b. the unencrypted password is stored in the group file
   c. the encrypted password is stored in the shadow file
   d. the password is locked
   e. the encrypted password is **"x"**

182. What is usually contained in the environment variable **$PATH**?
   a. the absolute path of your login shell
   b. the absolute path of your login home directory
   c. a colon-separated list of directories, each containing command files
   d. a colon-separated list of your **passwd** file fields
   e. the absolute path of the system **/path** directory

183. What is usually contained in the environment variable **$PATH**?
   a. the absolute path of your login shell
   b. a colon-separated list of directories containing command names
   c. the absolute path of the system **/path** directory
   d. a colon-separated list of your **passwd** file fields
   e. the absolute path of your login home directory

184. If I am in directory named **/home/me** and **dir** is an empty sub-directory, what is true after this command line:
```
touch new ; mv ./dir/../new ../me/old
```
   a. the parent directory of **dir** now has a file named **old** in it
   b. the directory **dir** now contains only a file named **old**
   c. there is a second copy of the file **new** in the file named **old**
   d. the command fails because the path **../me/old** does not exist
   e. the command fails because the path **./dir/../new** does not exist

185. What command shows all partition names and System IDs (types) on the sixth disk:
   a. **df -l /dev/sd6** *b.* **mount -l /dev/sd6**
   c. **fdisk -l /dev/sdf** *d.* **find -l /dev/sd6**
   e. **find -l /dev/sdf**

186. Which file contains a list of possible kernels to run after POST?
   a. **/var/log** *b.* **/boot/grub/grub.conf**
   c. **/etc/init.d** *d.* **/etc/fstab**
   e. **/etc/inittab**

187. Which command line initializes a swap partition for future use?
   a. **mkfs -s** *device* *b.* **mkswap** *device*
   c. **fdisk -s** *device* *d.* **swapon -s** *device*
   e. **swapon** *device*

188. What is the link count of directory **d** after these successful commands?
```
mkdir d d/a d/b d/c d/c/z ; touch d/x d/y
```
   a. **3** *b.* **6** *c.* **2** *d.* **4** *e.* **5**

189. What command fetches (downloads) a file given an http URL?
   a. **download** *b.* **ifetch** *c.* **find**
   d. **fetch** *e.* **wget**

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

191. If **dir** is a sub-directory that contains only the file **foo**, what happens after this command: **mv dir/foo dir/./../bar**
   a. the directory **dir** is now empty
   b. there is a second copy of the file **foo** in the file named **bar**
   c. the directory **dir** now contains only a file named **bar**
   d. the command fails because the name **dir/./../bar** does not exist
   e. the command fails because the name **bar** does not exist

192. What permissions are given to **newfile** after this command line:
```
umask 362 ; touch newfile
```
   a. **-wxr-x-w-** *b.* **-wx---r--** *c.* **r-----r--**
   d. **-wxrw--w-** *e.* **r----xr-x**

193. Which command line displays all the non-hidden names in the current directory that contain the case-insensitive word **go** (and no others)?
   a. **echo *[GgOo]*** *b.* **echo *[go][GO]***
   c. **echo *[go]*** *d.* **echo *[Gg][Oo]***
   e. **echo ?[GgOo]?**

194. Give the GRUB device name for the fourth partition of the third disk:
   a. **(hd3,2)** *b.* **(hd2,3)** *c.* **(hd4,3)**
   d. **(sd2,3)** *e.* **(sdd,3)**

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

196. 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 -3 | head -1
```
   a. **8** *b.* **7 7** *c.* **3 3** *d.* **9** *e.* **3**

197. If my current directory is **/etc**, which of these pathnames is equivalent to the file name **/etc/group**?
   a. **/root/etc/group** *b.* **../etc/group**
   c. **group/.** *d.* **../../etc/group/.**
   e. **./etc/group**

198. Which command line activates an existing swap partition?
   a. **swapon** *device* *b.* **mount -s** *device*
   c. **mkfs -s** *device* *d.* **mkswap** *device*
   e. **swapon -s** *device*

199. What command creates an **ext3** file system on *device ?*
   a. **mkfs -t ext3** *device* *b.* **fdisk -t ext3** *device*
   c. **mount -t ext3** *device* *d.* **file -t ext3** *device*
   e. **swapon -t ext3** *device*

200. Given the following, can user **bird** in group **sesame** copy **./foo** to **bar**?
```
drwxrw-r-x 2 root sesame 4096 Oct 7 14:00 .
-rwx-wx-wx 1 bird sesame 123  Oct 4 14:05 foo
```
a. No, because the directory is not accessible to **bird**
b. Yes, because **bird** has write permissions on **foo**
c. No, because the directory has no write permissions for others
d. No, because **foo** has no read permissions for **bird**
e. Yes; permissions don't apply because **bird** owns **foo**

201. How do the package managers YUM and RPM differ?
a. YUM is more high-level than RPM and can handle dependencies
b. RPM is more high-level than YUM and can handle dependencies
c. YUM is more high-level than RPM, but cannot handle dependencies
d. RPM handles RPM files and YUM handles DEB files
e. RPM is more high-level than YUM, but cannot handle dependencies

202. In an empty directory, what permissions are on file ******* after these commands:
```
touch *** ??? ; chmod 111 *
chmod 222 *** ; chmod 444 ???
```
a. **--x--x--x** *b.* **-w--w--w-** *c.* **r--r--r--**
d. **rw-rw-rw-** *e.* **-wx-wx-wx**

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

204. Why is a journalling file system better than non-journalling?
a. allows more than four primary partitions
b. supports more types of partitions
c. faster file system check after system crash
d. uses less disk space to store the same files
e. contains more inodes for files and directories

205. What permissions are given to **newdir** after this command line:
```
umask 156 ; mkdir newdir
```
a. **--xr-xrw-** *b.* **r-x--x---** *c.* **rw--w----**
d. **r-x-w-rw-** *e.* **rw--w---x**

206. What command displays the groups you are in?
a. **gpasswd** *b.* **grouprint** *c.* **lstgroups**
d. **groups** *e.* **mkgroups**

207. What command modifies existing account information (and possibly home directory)?
a. **adduser** *b.* **passwd** *c.* **newuser**
d. **makeuser** *e.* **usermod**

208. Which is the best choice for an extended partition size that will hold exactly two 100MB logical partitions?
a. 190MB *b.* 130MB *c.* 230MB
d. 200MB *e.* 330MB

209. Given the following, can user **kirk** in group **starfleet** remove **./file1**?
```
drwxr-xrwx 2 root starfleet 4096 Oct 7 14:00 .
rwxrwxrwx- 1 kirk starfleet 123  Oct 4 14:05 file1
```
a. Yes, because **kirk** matches the writable other permissions
b. Yes, because **kirk** has full permissions on **file1**
c. Yes, because **kirk** owns **file1**
d. No, because **kirk** has no write permission on the directory
e. No, because the directory is not accessible to **kirk**

210. What is the output on your screen after this command line:
```
cd /foo ; touch a ; mkdir 1 ; mkdir 2 ; pwd
```
a. **/1/2** *b.* **/foo/a** *c.* **/foo/1/2**
d. **/foo** *e.* **/foo/a/1/2**

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

212. What command powers down the machine safely?
a. **fdisk** *b.* **chkconfig** *c.* **shutdown**
d. **gpasswd** *e.* **passwd**

213. 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**
a. **two** followed by **one**
b. **one**
c. **two**
d. **one** followed by **two**
e. **bash: xxx: command not found**

214. What is the output on your screen of this two command sequence:
```
PATH=/bin/cat:/bin/sh:/bin/ls ; ls nosuchfile
```
a. **ls: /bin/ls: command not found**
b. **bash: ls: command not found**
c. **bash: /bin/sh: No such file or directory**
d. **ls: nosuchfile: No such file or directory**
e. **bash: /bin/ls: command not found**

215. When you show the type of file system inside an unmounted partition, what is displayed for a new, empty partition?
   a. **ext3** file system
   b. **ext2** file system (the default)
   c. data
   d. **vfat** file system
   e. **ntfs** file system

216. 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. **300** on directory, **600** on file
   b. **500** on directory, **500** on file
   c. **300** on directory, **400** on file
   d. **100** on directory, **500** on file
   e. **500** on directory, **600** on file

217. 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=/bin/ls:/home:/usr/bin/cat:/etc ; foo**
   a. **two** followed by **one**
   b. **two**
   c. **one** followed by **two**
   d. **bash: foo: command not found**
   e. **one**

218. Which command is used to change run levels?
   a. **chmod**
   b. **chkconfig**
   c. **runlevel**
   d. **telinit**
   e. **chsh**

219. What command line modifies and moves (in one command line) the home directory **foo** to **bar** for the existing user **vader**?
   a. **usermod -m -d /home/bar vader**
   b. **usermod -d -m /home/bar vader**
   c. **usermod -m -d /home/foo /home/bar**
   d. **usermod -d -m /home/vader bar**
   e. **usermod -dm /home/bar vader**

220. Pick the correct order of operations:
   a. **mount, fdisk, mkfs**
   b. **mkfs, fdisk, mount**
   c. **mount, mkfs, fdisk**
   d. **mkfs, mount, fdisk**
   e. **fdisk, mkfs, mount**

221. In a directory that contains only the file **a**, what happens after this command:
```
mv a b
```
   a. the command fails because the name **b** does not exist
   b. there is only the file named **b** in the directory now
   c. an empty file named **b** is created
   d. there is a second copy of the file **a** in the file named **b**
   e. the command fails because **a** is not a directory

222. 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. **bash: pig: command not found**
   b. **xx**
   c. **foo** followed by **xx**
   d. **xx** followed by **foo**
   e. **foo**

223. When using the **killall** command, a major risk is:
   a. the signal may not be sent to process started on different terminals
   b. the default signal is the stronger **HUP** signal
   c. the signal may be sent to every process started on in the current terminal
   d. the signal may be sent to unintended processes with the same name
   e. the default signal is the lethal **KILL** signal

224. What command creates a new user account?
   a. **passwd**
   b. **makeuser**
   c. **useradd**
   d. **gpasswd**
   e. **groupmod**

225. Given the following, can user **kirk** in group **starfleet** remove **./file1**?
```
d----wx--- 2 root starfleet 4096 Oct 7 14:00 .
---------- 1 kirk starfleet 123  Oct 4 14:05 file1
```
   a. No, because **kirk** has no permissions on **file1**
   b. No, because the directory is not accessible to **kirk**
   c. Yes, because **kirk** owns **file1**
   d. Yes, because **kirk**'s group matches the group writable directory
   e. No, because the directory has no permissions for other users

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

227. Which **crontab** line executes at **15:34** every day?
   a. *** * * 34 15 command**
   b. **34 15 * * * command**
   c. *** * * 15 34 command**
   d. **15 * * * 34 command**
   e. **15 34 * * * command**

228. 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. **1**
   b. no output
   c. **2**
   d. **a**
   e. **0**

229. To "throw away" (hide) standard error output of a command, use:
a. **date 2>/dev/sda1** *b.* **date 2>&1**
c. **date 1>&2** *d.* **date 2>/dev/null**
e. **date 1>/dev/sda1**

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

231. What command compares files line-by-line?
a. **linecmp** *b.* **diff** *c.* **tar**
d. **compare** *e.* **file**

232. In an empty directory, what is the output on your screen after this command line:
echo hi >a ; mv a b ; ls | wc -w
a. **0** *b.* no output *c.* **1**
d. **a** *e.* **2**

233. What type and permissions result from this command line:
umask 156 ; mkdir newdir ; ls -ld newdir
a. **d--xr-xrw-** *b.* **dr-x--x---** *c.* **drw--w---x**
d. **dr-x-w-rw-** *e.* **drw--w----**

234. In an empty directory, what is the output on your screen after this command line:
echo hi >.out ; ls *
a. an error message from **ls** saying ***** does not exist
b. **.out**
c. no output on screen
d. ***
e. **. .. .out**

235. Which command line below allows programs in the current directory to execute without preceding the names with **./**?
a. **PATH=/usr/bin/.:$HOME** *b.* **PATH=/bin:/usr/bin:.**
c. **$PATH=.:$HOME:/usr/bin** *d.* **$PATH=/usr/bin:./bin**
e. **PATH=./$HOME:/usr/bin**

236. 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. **foo**
b. **foo** followed by **hi**
c. **bash: bat: command not found**
d. **hi**
e. **hi** followed by **foo**

237. Given the following, can user **kirk** in group **starfleet** modify **./file1**?
dr-xr-xr-x 2 root starfleet 4096 Oct 7 14:00 .
-r-xrwxrwx 1 kirk starfleet 123 Oct 4 14:05 file1
a. No, because **kirk** has no write permission on the directory
b. No, because **kirk** has no write permissions on **file1**
c. No, because the directory is not accessible to **kirk**
d. No, because execute permissions are not set for **kirk** on **file1**
e. Yes, because **kirk** owns **file1**

238. 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: ls: command not found**
b. **/bin/cat: foo: No such file or directory**
c. **bash: cat: command not found**
d. **bash: /bin/cat: command not found**
e. no output on screen

239. 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. **/etc/bar/foo** *b.* **/etc/foo** *c.* **/foo**
d. **/bar/foo** *e.* **/etc/foo/bar**

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

241. Which GRUB command line displays the contents of the file **foo**?
a. **mount (hd0,0)/foo** *b.* **p (hd0,0)/foo**
c. **type (hd0,0)/foo** *d.* **ls (hd0,0)/foo**
e. **cat (hd0,0)/foo**

242. What is the purpose of the shadow password file?
a. to keep a back-up of the main password file in case of corruption
b. to allow passwords to exist on partitions other than the ROOT
c. to hide encrypted passwords from viewing by ordinary users
d. to reduce the size of the main password file for faster access
e. to store secondary passwords for times when you forget your main one

243. When a user named **foo** runs a command in an executable file owned by **bar**, in a directory owned by **root**, the file executes with the permissions of:
a. **root** *b.* **bar** *c.* **foo**
d. **root and bar** *e.* **root and foo**

244. What GRUB command will set a partition prefix that will prefix all file names typed without partition prefixes, e,g. **/grub/device.map**?
   a. **root=(hd0,0)** *b.* **root (hd0,0)**
   c. **default=(hd0,0)** *d.* **kernel (hd0,0)**
   e. **title (hd0,0)**

245. Given the following, can user **bird** in group **sesame** remove **./foo**?
```
drwxr-xrwx 2 root sesame 4096 Oct 7 14:00 .
rwxrwxrwx- 1 bird sesame 123  Oct 4 14:05 foo
```
   a. No, because **bird** has no write permission on the directory
   b. Yes, because **bird** has full permissions on **foo**
   c. No, because the directory is not accessible to **bird**
   d. Yes, because **bird** matches the writable other permissions
   e. Yes; permissions don't apply because **bird** owns **foo**

246. On a disk with seven partitions, give the correct partition names after you delete partition **sda5**:
   a. **sda1 sda2 sda3 sda4 sda6**
   b. **sda1 sda2 sda3 sda4 sda5 sda6**
   c. **sda1 sda2 sda3 sda4 sda5**
   d. **sda1 sda2 sda3 sda4 sda6 sda7**
   e. **sda1 sda2 sda3 sda4 sda5 sda7**

247. Given this **ls -il** long listing:
```
454 drwxr-xr-x 123 me me 456 Dec 4 9:12 dir
```
   How many subdirectories lie immediately under **dir**?
   a. **121** *b.* **458** *c.* **456** *d.* **454** *e.* **123**

248. On a disk with eight partitions, give the correct partition names after you delete partition **sda5**:
   a. **sda1 sda2 sda3 sda4 sda5 sda6 sda8**
   b. **sda1 sda2 sda3 sda4 sda5 sda6 sda7**
   c. **sda1 sda2 sda3 sda4 sda5 sda6**
   d. **sda1 sda2 sda3 sda4 sda5 sda7 sda8**
   e. **sda1 sda2 sda3 sda4 sda6 sda7 sda8**

249. What command displays your numerical UID and GID?
   a. **ugprint** *b.* **id** *c.* **passwd**
   d. **uidprint** *e.* **gd**

250. Give the GRUB device name for the third partition of the fourth disk:
   a. **(hd2,3)** *b.* **(hd3,2)** *c.* **(sdd,3)**
   d. **(hd4,3)** *e.* **(sd2,3)**

251. What permissions are given to **newfile** after this command line:
```
umask 632 ; touch newfile
```
   a. **----wxr--** *b.* **r-x-wx-w-** *c.* **rw--wx-w-**
   d. **--xr--r-x** *e.* **---r--r--**

252. When a user named **bob** runs a command in a **setuid** executable file owned by **foo**, in a directory owned by **root**, the file executes with the permissions of:
   a. **root and bob** *b.* **root and foo** *c.* **root**
   d. **foo** *e.* **bob**

253. When a personal **crontab** job runs, the current working directory is set to:
   a. the system ROOT directory
   b. the HOME directory of the user
   c. the directory **/root**
   d. the directory **/home**
   e. the current directory that was in use when the **crontab** job was created

254. Which permissions on a directory mean that anyone can create a new file inside it, but nobody can see the names of the files inside it?
   a. **555** *b.* **222** *c.* **666** *d.* **444** *e.* **333**

255. When an **at** job runs, the current working directory is set to:
   a. the system ROOT directory
   b. the HOME directory of the user
   c. the current directory that was in use when the **at** job was created
   d. the directory **/root**
   e. the directory **/home**

256. If your terminal type is **xterm**, what is the output of this command line?
```
echo '$TERM'
```
   a. no output on screen *b.* **$TERM**
   c. **'xterm'** *d.* **xterm**
   e. **'$TERM'**

257. What do you notice in the user/owner field if you use **ls -l** on a file owned by a deleted user?
   a. the field is the name **"removed"**
   b. the field is an account name in parentheses, e.g. **(luke)**
   c. the field is the name **"deleted"**
   d. the field is a number instead of an account name
   e. the field is the number zero

258. Other than root, who can change the permissions of the following directory?
```
dr-xrwxrwx 17 foo bar 4096 Apr 15 16:40 .
```
   a. anyone except user **foo**
   b. only user **foo**
   c. only root can change the permissions
   d. user **foo** and any user in group **bar**
   e. only users in group **bar**

259. What are **upstart** and **systemd**?
   a. programs to handle UPS back-up power systems
   b. replacements for the legacy run levels
   c. time synchronization daemons
   d. programs to handle system log messages
   e. uptime measurement and statistical programs

260. When you log in, you have the permissions of:
   a. one numeric user UID and one group GID
   b. multiple numeric user UIDs and one group GID
   c. one numeric user UID and no group GIDs
   d. multiple numeric user UIDs and multiple group GIDs
   e. one numeric user UID and multiple group GIDs

261. A "swap" partition is used:
   a. to run programs larger than the available memory
   b. to keep a back-up copy of user home directories
   c. to allow swapping a new disk for one with bad sectors
   d. to store extra files when the ROOT disk gets full
   e. to keep large user home directories

262. If my current directory is **/etc**, which of these pathnames is equivalent to the pathname **/etc/x/y**?
   a. **../x/y** *b.* **../etc/x/y** *c.* **/x/y**
   d. **./etc/x/y** *e.* **../etc/./y**

263. Which of these files controls where system log messages get stored?
   a. **/etc/syslog.conf** *b.* **/etc/group**
   c. **/grub/grub.conf** *d.* **/etc/passwd**
   e. **/boot/grub/grub.conf**

264. What is true about this output from **ls -il foo bar**
```
454 -rwxr-xr-x 2 me me 3 Dec 4 9:12 foo
454 -rwxr-xr-x 2 me me 3 Dec 4 9:12 bar
```
   a. this output is not possible
   b. **foo** and **bar** are names for different files
   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

265. Which command mounts the second partition of the third disk on directory **foo**?
   a. **mount /dev/sdc2 /mnt/foo**
   b. **mount -t ntfs /mnt/sdc2 /dev/foo**
   c. **mount -t vfat /mnt/foo /dev/sdc2**
   d. **mount /mnt/foo /dev/sdc2**
   e. **mount /mnt/sdc2 /dev/foo**

266. Given the following, can user **kirk** in group **starfleet** rename **./file1** to **file2**?
```
d----wx--- 2 root starfleet 4096 Oct 7 14:00 .
---------- 1 kirk starfleet 123  Oct 4 14:05 file1
```
   a. No, because the directory has no permissions for other users
   b. No, because **kirk** has no permissions on **file1**
   c. Yes, because **kirk**'s group matches the group writable directory
   d. Yes, because **kirk** owns **file1**
   e. No, because **kirk** cannot read the directory

267. If I mount one file system on directory **/a** and another file system on directory **/b,** how can I link the existing file **/a/foo** to the new pathname **/b/new**?
   a. **ln /a/foo /b/new** *b.* **ln /a/new /b/foo**
   c. **ln -s /a/foo /b/new** *d.* **ln -s /b/new /a/foo**
   e. **ln /b/new /a/foo**

268. Which command line shows just the count of words in the file?
   a. **wc file | awk '{print $2}'**
   b. **wc file | awk '{print #2}'**
   c. **wc file | awk '{print 2}'**
   d. **wc file | awk '[print $2]'**
   e. **wc file | awk '[print #2]'**

269. What is true about this output from **ls -il foo bar**?
```
454 -rwxr-xr-x 3 me me 2 Dec 4 9:12 foo
456 -rwxr-xr-x 3 me me 2 Dec 4 9:12 bar
```
   a. **foo** and **bar** each have two names (four names total)
   b. **foo** and **bar** each have three names (six names total)
   c. this output is not possible
   d. **foo** and **bar** are two of three names for this file
   e. **foo** and **bar** are names for the same file

270. What command shows the kernel "ring buffer" of system messages?
   a. **crontab** *b.* **dmesg** *c.* **ringout**
   d. **syslog** *e.* **pstree**

271. Which of the following PATH statements makes the most sense?
   a. **PATH=/bin/ls:/etc/passwd:/usr/bin**
   b. **PATH=/bin/bash:/usr/bin:/bin**
   c. **PATH=/bin:/usr/bin:/etc/shadow**
   d. **PATH=/bin:/usr/bin**
   e. **PATH=/bin:/etc/group:/usr/bin**

272. What is the output on your screen of this two command sequence:
```
PATH=/bin/ls:/bin/cat:/bin/sh ; cat nosuchfile
```
a. **cat: nosuchfile: No such file or directory**
b. **bash: /bin/sh: No such file or directory**
c. **bash: cat: command not found**
d. **ls: /bin/cat: command not found**
e. **bash: /bin/ls: command not found**

273. What would you type to change the permissions on a file to **-wxr-xrw-**?
a. **chmod 635 file** *b.* **chmod 210 file**
c. **chmod 421 file** *d.* **chmod 356 file**
e. **chmod 563 file**

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

275. Which system directory contains all the run level scripts?
a. **/var/log** *b.* **/etc/init.d**
c. **/boot/grub.config** *d.* **/etc/group**
e. **/etc/passwd**

276. If file **foo** contains 3 lines, and file **bar** contains 4 lines, then how many lines are output on your screen by this command line: **cp foo bar | cat**
a. **4** *b.* **3** followed by **4**
c. no output on screen *d.* **4** followed by **3**
e. **3**

277. In an empty directory, what is the output on your screen after this command line:
```
touch a b .1 .2 ; echo .??*
```
a. **a b**
b. **.??***
c. **. .. .1 .2**
d. **. .. a b .1 .2**
e. an error message from **echo** saying **.??*** does not exist

278. Given the following, can user **bird** in group **sesame** modify **./foo**?
```
dr-xr-xr-x 2 root sesame 4096 Oct 7 14:00 .
-r-xrwxrwx 1 bird sesame 123  Oct 4 14:05 foo
```
a. No, because the directory is not accessible to **bird**
b. No, because execute permissions are not set for **bird** on **foo**
c. Yes; permissions don't apply because **bird** owns **foo**
d. No, because **bird** has no write permission on the directory
e. No, because **bird** has no write permissions on **foo**

279. What is true about this output from **ls -il foo bar**
```
454 -rwxr-xr-x 3 me me 2 Dec 4 9:12 foo
456 -rwxr-xr-x 3 me me 2 Dec 4 9:12 bar
```
a. this output is not possible
b. **foo** and **bar** are names for different files
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** each have two names (four names total)

280. What is true about this output from **ls -il foo bar**?
```
15 -r-x------ 2 bin bin 3 Jul 31 12:33 foo
15 -rwxrwxrwx 2 bin bin 3 Jul 31 12:33 bar
```
a. **foo** and **bar** are names for the same file
b. **foo** and **bar** are two of three names for the same file
c. **foo** and **bar** each have three names (six names total)
d. **foo** and **bar** are names for different files
e. this output is not possible

281. The **minimum** permissions you need to copy a file **foo** from directory **a** to directory **b** are:
a. **rx** on **a**, **wx** on **b**, **w** on **foo**
b. **x** on **a**, **wx** on **b**, **r** on **foo**
c. **wx** on **a**, **wx** on **b**, none on **foo**
d. **rwx** on **a**, **wx** on **b**, none on **foo**
e. **wx** on **a**, **wx** on **b**, **rw** on **foo**

282. To list your personal crontab, type:
a. **atq** *b.* **/etc/crontab**
c. **/var/log/crontab** *d.* **cat crontab**
e. **crontab -l**

283. What is true about this output from **ls -il foo bar**?
```
23 -r-x------ 2 bin bin 3 Jul 31 12:33 foo
23 -rwxrwxrwx 2 adm adm 3 Nov  1 00:01 bar
```
a. this output is not possible
b. **foo** and **bar** are names for different files
c. **foo** and **bar** are two of three names for the same file
d. **foo** and **bar** each have three names (six names total)
e. **foo** and **bar** are names for the same file

284. In an empty directory, what is the output on your screen after this command line:
```
touch 1 2 .foo .bar ; echo .*
```
a. **1 2**
b. **. .. .foo .bar**
c. an error message from **echo** saying **.*** does not exist
d. **.***
e. **.foo .bar**

285. The **/etc/fstab** file contains a list of:
   a. file system tables used by the usermod command
   b. file systems to mount when booting the system
   c. currently mounted file systems
   d. file system tables used by the adduser command
   e. file system tables used to identify partition types

286. The correct syntax to assign to a shell variable is:
   a. **x = "hello there"** *b.* **"x=hello there"**
   c. **x = hello there** *d.* **x=hello there**
   e. **x="hello there"**

287. What command line would create a file system on a disk partition?
   a. **file -t ext3 /dev/sda1**
   b. **mkswap -t ext3 /dev/sda1**
   c. **mkfs /mnt/sda1**
   d. **fdisk -t ext3 /mnt/sda1**
   e. **mkfs /dev/sda1**

288. 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. **/etc/foo** *b.* **/etc/foo/bar** *c.* **/etc/bar/foo**
   d. **/bar/foo** *e.* **/foo**

289. If **xxx** is a sub-directory that contains only the file **foo**, what happens after this command: **mv ./xxx/./foo ./xxx/../bar**
   a. the command fails because the name **./xxx/../bar** does not exist
   b. the directory **xxx** is now empty
   c. the directory **xxx** now contains only a file named **bar**
   d. the command fails because the name **./xxx/./foo** does not exist
   e. there is a second copy of the file **foo** in the file named **bar**

290. What is the final link count of file **a** after this:
```
ln a d ; cp a f ; ln d c ; ln f g ; ln c e
```
   a. 1 *b.* 2 *c.* 4 *d.* 3 *e.* 5

291. In an empty directory, what permissions are on file **???** after these commands:
```
touch ??? *** ; chmod 111 *
chmod 222 ??? ; chmod 444 '***'
```
   a. **--x--x--x** *b.* **-wx-wx-wx** *c.* **-w--w--w-**
   d. **rw-rw-rw-** *e.* **r--r--r--**

292. How many arguments are passed to the command by the shell on this command line: **<foo foo " a 'b c' d " e ' f " g " ' >foo**
   a. **5** *b.* **6** *c.* **3** *d.* **4** *e.* **2**

293. What is the output on your screen after this command line:
```
cd /home/ian ; mkdir a ; mkdir b ; pwd
```
   a. **/b** *b.* **/home/ian/a/b**
   c. **/home/ian/b** *d.* **/home/ian**
   e. **/home/ian/a**

294. What permissions are given to **newdir** after this command line:
```
umask 516 ; mkdir newdir
```
   a. **-w-r-xrw-** *b.* **--xr-x---** *c.* **-w-rw---x**
   d. **r-x--xrw-** *e.* **-w-rw----**

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

296. What GRUB command will display the partitions on the third disk?
   a. **fdisk (hd2)** *b.* **ls (hd3)**
   c. **mount (hd3)** *d.* **geometry (hd2)**
   e. **cat (hd3)**

297. What command schedules other commands to run just *once* at some future date/time?
   a. **run** *b.* **chkconfig** *c.* **schedule**
   d. **crontab** *e.* **at**

298. The **minimum** permissions you need to move a file **foo** from directory **a** to directory **b** are:
   a. **wx** on **a**, **wx** on **b**, **r** on **foo**
   b. **wx** on **a**, **wx** on **b**, **w** on **foo**
   c. **wx** on **a**, **wx** on **b**, none on **foo**
   d. **rwx** on **a**, **wx** on **b**, none on **foo**
   e. **rwx** on **a**, **wx** on **b**, **rw** on **foo**

299. To redirect both standard output and standard error into the same output file, use:
   a. **cmd 2>&1 >out** *b.* **cmd 1>out 2>out**
   c. **cmd 2>1 >out** *d.* **cmd >out 2>&1**
   e. **cmd 1>out 2>1**

300. Given the following, can user **kirk** in group **starfleet** modify **./file1**?
```
dr-xr-xr-x 2 root starfleet 4096 Oct 7 14:00 .
-rw-r-xr-x 1 kirk starfleet 123  Oct 4 14:05 file1
```
a. No, because **kirk** has no write permission on the directory
b. No, because execute permissions are not set for **kirk** on **file1**
c. Yes, because **kirk** has write permissions on **file1**
d. Yes, because **kirk** owns **file1**
e. No, because the directory is not accessible to **kirk**

301. 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
```
a. no output on screen
b. **bat**
c. **cat: bat: No such file or directory**
d. **foo**
e. **bash: cat: command not found**

302. If file **a** contains 3 lines, and file **b** contains 2 lines, then how many lines are output on your screen by this command line: **rm a b | cat**
a. **3** followed by **2**
b. **3**
c. **2** followed by **3**
d. **5**
e. no output on screen

303. What would you type to change the permissions on a file to **r-x-wxrw-**?
a. **chmod 241 file**
b. **chmod 536 file**
c. **chmod 365 file**
d. **chmod 653 file**
e. **chmod 120 file**

304. When the shell exits, what happens to paused ("Stopped") jobs of the shell?
a. they are sent a termination signal
b. they exit
c. they are stopped
d. they are made into foreground jobs
e. they keep running

305. Given this **ls -il** long listing:
```
302 drwxr-xr-x 202 bin bin 102 Jul 31 12:33 dir
```
How many subdirectories lie immediately under **dir**?
a. **100** *b.* **202** *c.* **102** *d.* **200** *e.* **300**

306. If file **a** contains 3 lines, then how many lines are output on your screen by this command line: **cat a | echo hi**
a. **1** followed by **3**
b. **3** followed by **1**
c. **4**
d. **3**
e. **1**

307. What is true about this output from **ls -il foo bar**?
```
454 -rwxr-xr-x 3 me me 2 Dec 4 9:12 foo
454 -rw-r--r-- 3 me me 2 Dec 4 9:12 bar
```
a. **foo** and **bar** are names for the same file
b. **foo** and **bar** are two of three names for this file
c. **foo** and **bar** are names for different files
d. **foo** and **bar** each have three names (six names total)
e. this output is not possible

308. If my current directory is **/bin**, which of these pathnames is equivalent to the file name **/bin/ls**?
a. **ls**
b. **/root/bin/ls**
c. **../bin/ls/.**
d. **/ls**
e. **./bin/ls**

309. Which system directory contains the run level scripts only for run level 3?
a. **/etc/init.d3**
b. **/3/init.d**
c. **/3/grub.d**
d. **/etc/rc3.d**
e. **/3/rc.d**

310. You enter this **cp a/b c/**
and get **cp: a: No such file or directory**
because:
a. directory **a** does not exist
b. pathname **a** exists but is a file, not a directory
c. directory **c** does not exist
d. the command **cp** is not in your search PATH
e. you forgot to specify the destination file name after **c/**

311. What high-level command fetches and tracks packages for Fedora or Red Hat?
a. **apt-get**
b. **rpm**
c. **tar**
d. **wget**
e. **yum**

312. In the output of **ls -a**, a dot (period) that *begins* any name signifies what?
a. the parent directory
b. an unprintable character
c. the current directory
d. a current file
e. a name that is hidden

313. If you are in **/etc** and **ls -l** shows a symbolic link **bar -> ../you/foo** then dereference the absolute path of **bar** with no symbolic links:
a. **/etc/you/foo**
b. **/etc/bar/you/foo**
c. **/bar/you/foo**
d. **/you/foo**
e. **/etc/you/foo/bar**

314. What is usually contained in the environment variable **$USER**?
a. a copy of your user mask (umask)
b. your default user permissions for files
c. your default user permissions for directories
d. your first and last user name, separated by a space
e. your login account name

315. What is contained in the local variable **$$** ?
   a. the command name of the previous command line
   b. the cpu cost of the current session, in dollars
   c. the process ID of the current shell
   d. the first argument of the previous command line
   e. **$$** is not a valid variable name

316. 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 xxx
```
   a. **3** *b.* **5** *c.* **4** *d.* **2** *e.* **1**

317. Given the following, can user **bird** in group **sesame** copy **./foo** to **bar**?
```
drwxr-xrwx 2 root sesame 4096 Oct 7 14:00 .
-r-xr-xr-x 1 bird sesame 123  Oct 4 14:05 foo
```
   a. Yes, because **bird** has read permissions on **foo**
   b. No, because the directory has no write permissions for **bird**
   c. No, because **foo** has no write permissions for **bird**
   d. Yes; permissions don't apply because **bird** owns **foo**
   e. No, because the directory is not accessible to **bird**

318. Which permissions on a directory mean that anyone can see the names of the files inside it, but nobody can access any of the files?
   a. **333** *b.* **222** *c.* **111** *d.* **444** *e.* **555**

319. When a user named **bob** runs a command in an executable file owned by **foo**, in a directory owned by **root**, the file executes with the permissions of:
   a. **root and bob** *b.* **foo** *c.* **root**
   d. **root and foo** *e.* **bob**

320. What is the output on your screen after this command line:
```
mkdir d ; touch d/.aa d/.bb ; echo d/*
```
   a. **d/. d/.. d/.aa d/.bb** *b.* **d/.aa d/.bb**
   c. **d/** *d.* no output
   e. **d/***

321. What command displays the groups you are in?
   a. **gpasswd** *b.* **lstgroups** *c.* **ps**
   d. **groups** *e.* **grouprint**

322. What is in file **c** after these successful commands?
```
echo A >a ; ln a b ; echo B >b ; ln a c ; rm a b
```
   a. no such file (nonexistent) *b.* **A** followed by **B**
   c. **A** *d.* **B**
   e. nothing (empty file)

323. Under what directory are system configuration files usually stored?
   a. **/log/var** *b.* **/var/log** *c.* **/etc**
   d. **/boot/grub** *e.* **/grub/boot**

324. If **dir** is a sub-directory that contains only the file **foo**, what happens after this command: **mv ./dir/./foo ./dir/../bar**
   a. there is a second copy of the file **foo** in the file named **bar**
   b. the directory **dir** is now empty
   c. the command fails because the name **./dir/../bar** does not exist
   d. the directory **dir** now contains only a file named **bar**
   e. the command fails because the name **./dir/./foo** does not exist