Question 1:
A DevOps engineer is working on a local copy of a Git repository. The engineer would like to switch from the main branch to the staging branch but notices the staging branch does not exist. Which of the following Git commands should the engineer use to perform this task?

- A. git branch -m staging
- B. git commit -m staging
- C. git status -b staging
- D. git checkout -b staging

Question 2:
A Linux administrator is removing non-permanent rules from the system firewall. Which of the following commands will allow the administrator to achieve this goal in the safest way possible?

- A. firewall-cmd --set-default-zone
- B. firewall-cmd --runtime-to-permanent
- C. firewall-cmd --reload
- D. firewall-cmd --complete-reload

Question 3:
A Linux administrator is troubleshooting a system with low performance. The administrator runs a few commands and receives the following output:

```
top - 14:06:18 up 27 days, 20:40, 1 user, load average: 2.43, 1.80, 5.32

Tasks: 2490 total, 3 running, 2485 sleeping, 1 stopped, 1 zombie

%Cpu(s): 55.5 us, 3.5 sy, 0.0 ni, 41.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st

KiB Mem : 26388633+total, 1970604 free, 67325492 used, 2377277+buff/cache

KiB Swap: 33554428 total, 33223392 free, 33036 used, 2525066+avail Mem


  PID  USER   PR  NI  VIRT   RES  SHR  S   %CPU  %MEM  TIME+  COMMAND

 27973  root   20   0 47848 9180 3884  R   97.0   0.0   116:20  java

 16689  root   20   0 303794 9364 334  S   27.0   0.0   115:05  make_list

 7238   root   20   0 375332 8198 904  S   10.0   0.0   102:28  metricbeat

 1234   root   20   0 104476 892  892  S   1.0    0.0   0:01.01  top
```

vmstat:

```
procs -----------memory---------- ---swap-- -----io---- -system-- ----cpu----
 r  b   swpd    free   buff  cache   si   so    bi   bo  in   cs  us sy id wa st
 2  1   330496 19563352 63831676 373145914 0   0    174366 0   2   586  3  5 86  0
```

Which of the following is the most likely cause of the issue?

- A. The disk I/O is high.
- B. The swap is low.
- C. The memory usage is high.
- D. The CPU utilization is high.

Question 4:
A Linux administrator is tasked with moving files in a database server. The administrator must not overwrite any existing files. Which of the following commands would indicate that the file already exists?

- A. mv -i filename /tmp/backup
- B. mv -b filename /tmp/backup
- C. mv -n filename /tmp/backup
- D. mv -f filename /tmp/backup

Question 5:

A Linux administrator attempts to log in to a server over SSH as root and receives the following error message: Permission denied, please try again.

The administrator is able to log in to the console of the server directly with root and confirms the password is correct. The administrator reviews the configuration of the SSH service and gets the following output:

```
Port 22

PermitRootLogin prohibit-password

PasswordAuthentication yes

PermitEmptyPasswords no

UsePAM no

MaxSessions 3
```

MaxAuthTries 3

Based on the above output, which of the following will most likely allow the administrator to log in over SSH to the server?

A. Log out other user sessions because only one is allowed at a time.

B. Enable PAM and configure the SSH module.

C. Modify the SSH port to use 2222.

D. Use a key to log in as root over SSH.

Question 6:

An administrator needs to restrict a file's permission set in the following ways:

The file needs to be read and write, but it should not be executable to the file owner.

The file needs to be read-only and executable to the group owner.

The file needs to be read-only to all other users.

Which of the following represents the next command the administrator should execute?

A. chmod 210 file.txt

B. chmod 654 file.txt

C. chmod 753 file.txt

D. chmod 777 file.txt

Question 7:
A Linux administrator is troubleshooting poor CPU performance on a virtual machine. The administrator thinks that the underlying hypervisor may be starved for resources. The administrator uses the top command to check the current CPU usage.
Which of the following CPU metrics supports the administrator's theory?

- A. user
- B. nice
- C. steal
- D. system

Question 8:
An administrator attempts to connect to a remote server by running the following command:

```
$ nmap 192.168.10.36
Starting Nmap 7.60 ( https://nmap.org ) at 2022-03-29 20:20 UTC
Nmap scan report for www1 (192.168.10.36)
Host is up (0.00019s latency).
Not shown: 979 closed ports
PORT    STATE  SERVICE
21/tcp   open   ftp
22/tcp   filtered ssh
631/tcp  open   ipp

Nmap done: 1 IP address (1 host up) scanned in 0.06 seconds
```

Which of the following can be said about the remote server?

- A. A firewall is blocking access to the SSH server.
- B. The SSH server is not running on the remote server.
- C. The remote SSH server is using SSH protocol version 1.
- D. The SSH host key on the remote server has expired.

Question 9:
An administrator wants to create a shortcut to /shared/dev/projects.
Which of the following commands can the administrator use to create a link to the projects directory from the administrator's home directory?

- A. ln ~/projects /shared/dev/projects
- B. ln -s /home/admin/projects /shared/dev/projects
- C. ln /home/admin/projects ~/projects
- D. ln -s /shared/dev/projects /home/admin/projects

Question 10:
A Linux administrator needs to harden a system and guarantee that the Postfix service will not run even after a restart or system upgrade.
Which of the following commands allows the administrator to fulfill the requirement?

- A. systemctl mask postfix.service
- B. systemctl disable postfix.service
- C. systemctl stop postfix.service
- D. systemctl restart postfix.service

Question 11:
A Linux administrator needs to check the content of a log file that is appending data as the file grows.
Which of the following commands should the administrator use to accomplish this task?

- A. tail -f log.txt
- B. tail -v log.txt
- C. tail -c log.txt
- D. tail log.txt

Question 12:
A Linux administrator would like to run the cleanup script /home/admin/script.sh at 9:00 p.m. on March 31.
Which of the following commands should the administrator use to accomplish this task?

- A. at -f /home/admin/script.sh 9pm March 31
- B. echo /home/admin/script.sh | at 9pm March 31
- C. at 9pm March 31 echo /home/admin/script.sh
- D. at 9pm March 31 /home/admin/script.sh

Question 13:
A systems administrator needs to list the contents of archive.tar.xz.
Which of the following commands will list the files?

- A. tar ddF archive.tar.xz
- B. tar tJf archive.tar.xz
- C. tar xzF archive.tar.xz
- D. tar jvF archive.tar.xz

Question 14:
A cloud engineer wants to delete all unused networks that are not referenced by any container.
Which of the following commands will achieve this goal?

- A. docker network erase
- B. docker network clear

- C. docker network prune
- D. docker network rm

Question 15:
A systems technician is configuring an application server to accept packets from a trusted source with the IP address 192.168.10.22.
Which of the following commands will allow communication between the two servers?

- A. iptables -L -v 192.168.10.22 -j ACCEPT
- B. iptables -D INPUT -v 192.168.10.22 -j ACCEPT
- C. iptables -A INPUT -v 192.168.10.22 -j ACCEPT
- D. iptables -A OUTPUT -v 192.168.10.22 -j ACCEPT

Question 16:
The development team created a new branch with code changes that a Linux administrator needs to pull from the remote repository. When the administrator looks for the branch in Git, the branch in question is not visible.
Which of the following commands should the Linux administrator run to refresh the branch information?

- A. git fetch
- B. git checkout
- C. git clone
- D. git branch

Question 17:
A Linux administrator is reviewing changes to a configuration file that includes the following section:

```
tls:
 certificates:
   certFile: /etc/ssl/cert.cer
   keyFile: /etc/ssl/cert.key
 stores: default
   certFile: /etc/ssl/expired.cer
   keyFile: /etc/ssl/expired.key
 stores: expired
```

The Linux administrator is trying to select the appropriate syntax formatter to correct any issues with the configuration file.
Which of the following should the syntax formatter support to meet this goal?

- A. Markdown
- B. XML
- C. YAML
- D. JSON

Question 18:
After making a configuration change to an Apache web server, an administrator needs to reload the service. However, sudo access was only granted to the killall command.
Which of the following commands should the administrator use to load the new configuration?

- A. sudo killall -HUP httpd
- B. sudo killall --reload httpd
- C. sudo killall -9 httpd
- D. sudo killall -TERM httpd

Question 19:
Which of the following is a benefit of a service mesh?

- A. Encrypted communication between two services in a Kubernetes environment.
- B. Direct access to the Kubernetes API services through the use of tokens.
- C. Elevated privileges in a Kubernetes pod to allow root access in a hardened cluster.
- D. Creating PVCs in a Kubernetes cluster to store and manage persistent data.

Question 20:
The journalctl entries have filled a Linux machine's /var volume.
Which of the following is the best command for a systems administrator to use to free up the disk space occupied by these entries?

- A. journalctl --rotate && journalctl --vacuum-time=1s
- B. systemctl stop systemd-journald && systemctl start systemd-journald
- C. rm -rf /var/log/journal && systemctl restart systemd-journald
- D. pkill -HUP systemd-journald && systemctl restart systemd-journald

---

Question 21:
A user on a Linux workstation needs to remotely start an application on a Linux server and then

forward the graphical display of that application back to the Linux workstation.
Which of the following would enable the user to perform this action?

- A. ssh -X user@server application
- B. ssh -Y user@server application
- C. ssh user@server application
- D. ssh -D user@server application

Question 22:
A systems administrator just downloaded a source code package with the file extension TGZ.
Which of the following commands would decompress and unarchive the package?

- A. tar -xzf
- B. tar --zcvpf
- C. tar -xvf
- D. tar --zxvf

Question 23:
A Linux administrator generated a list of users who have root-level command-line access to the Linux server to meet an audit requirement. The administrator analyzes the following /etc/passwd and /etc/sudoers files:

```
$ cat /etc/passwd

root:x:0:0:/home/root:/bin/bash

lee:x:500:500:/home/lee:/bin/csh

mallory:x:501:501:/root:/bin/csh

eve:x:502:502:/home/eve:/bin/ologin

carl:x:503:503:/home/carl:/bin/sh

bob:x:504:504:/home/bob:/bin/ksh

alice:x:505:505:/home/alice:/bin/tsh
```

```
$ cat /etc/sudoers

Cmnd_Alias SHELLS = /bin/csh, /bin/sh, /bin/bash

Cmnd_Alias SYSAADMIN = /usr/sbin/cpadmin

lee ALL = (ALL) ALL
```

```
bob ALL = NOPASSWD: SYSAADMIN
```

Which of the following users, in addition to the root user, should be listed in the audit report as having root-level command-line access? (Select two.)

- A. Carl
- B. Lee
- C. Mallory
- D. Eve
- E. Bob
- F. Alice

Question 24:
An administrator found a suspicious public IP address in a log file.
Which of the following commands can be used with the IP address to resolve back to a domain? (Select two.)

- A. dig -x
- B. dig
- C. whois
- D. nslookup
- E. traceroute -n
- F. hostname

Question 25:
An administrator would like to measure possible packet loss between a workstation and a remote web application that is running on port 443.
Which of the following would be the best command for the administrator to use to display this information?

- A. ping -c 50 <remote server IP>
- B. tcpdump -p 443 <remote server IP>
- C. mtr -T -P 443 <remote server IP>
- D. traceroute -p 443 <remote server IP>

Question 26:
An administrator is investigating the reason a Linux workstation is not resolving the website http://www.comptia.org. The administrator executes some commands and receives the following output:

```
$ dig @8.8.8.8 www.comptia.org +short
104.18.16.29


$ nslookup -querytype=AAAA www.comptia.org
Name: www.comptia.org
Address: 104.18.16.29


$ nslookup -querytype=AAAA www.comptia.org
*** Can't find www.comptia.org: No answer


$ ping -4 www.comptia.org
PING www.comptia.org (104.18.16.29): 56 data bytes
From somehost (192.168.99.101) icmp_seq=3 Destination Host Unreachable


$ cat /etc/hosts
127.0.0.1 localhost.localdomain localhost
104.18.99.101 www.comptia.org
```

Which of the following is the most likely cause?

- A. The static entry in /etc/hosts needs to be removed.
- B. The remote website does not support IPv6, and the workstation requires it.
- C. The firewall needs to be modified to allow outbound HTTP and HTTPS.
- D. The nameserver in /etc/resolv.conf needs to be updated to 8.8.8.8.

Question 27:
Which of the following will prevent non-root SSH access to a Linux server?

- A. Creating the /etc/nologin file
- B. Creating the /etc/nologin.allow file containing only a single line root
- C. Creating the /etc/nologin/login.deny file containing a single line +all
- D. Ensuring that /etc/pam.d/ssh includes account sufficient pam_nologin.so

Question 28:
A Linux systems administrator is preparing to install updates using APT. The administrator notices the version of the packages that will be installed differs from the latest version on the Ubuntu website.

Which of the following commands should the administrator use to obtain the latest version of the package?

- A. apt update
- B. apt-get refresh
- C. apt purge
- D. apt-get cache update

Question 29:
A Linux administrator is attempting to create a KVM on a remote Linux server. After failing to create the VM, the administrator runs some commands and reviews the following output:

Output 1:

```
/lscpu

Architecture: x86_64

CPU op-mode(s): 32-bit, 64-bit


Virtualization features:

Hypervisor vendor: Microsoft

Virtualization type: full
```

Output 2:

```
# cat /etc/modprobe.d/kvm.conf

options kvm_intel nested=1
```

Which of the following is the most likely cause of the issue?

- A. Virtualization does not work on 32-bit processors.
- B. The virtual server does not allow VMs running inside the VM.
- C. The memory capacity and swap space are both inadequate.
- D. The boot partition does not have enough available space.

Question 30:
A systems administrator has changed the permissions on the /etc/passwd file. When a user attempts to log in, the following is displayed on the command prompt:

```
I have no name!
```

```
$ ls -l /etc/passwd /etc/shadow

-rw------- 1 root 7868 Oct 18 10:45 /etc/passwd

-rw------- 1 shadow 10548 Oct 18 10:45 /etc/shadow
```

Which of the following commands will fix the file permissions?

- A. sudo chmod 755 /etc/passwd
- B. sudo chmod 644 /etc/passwd
- C. sudo chmod 644 /etc/shadow
- D. sudo chmod 755 /etc/shadow

Question 31:
A Linux administrator is configuring a two-node cluster and needs to be able to connect the nodes to each other using SSH keys from the root account.
Which of the following commands will accomplish this task?

- A. [root@nodea ~]# ssh -i ~/.ssh/id_rsa root@nodeb
- B. [root@nodea ~]# scp -i ~/.ssh/id_rsa root@nodeb
- C. [root@nodea ~]# ssh-copy-id -i ~/.ssh/id_rsa root@nodeb
- D. [root@nodea ~]# ssh-agent -i ~/.ssh/id_rsa root@nodeb
- E. [root@nodea ~]# ssh-add -i ~/.ssh/id_rsa root@nodeb

Question 32:
An administrator is securely mirroring the working development directory to the staging server.
Which of the following should the administrator use to accomplish this task?

- A. scp -r /home/dev dev@staging.DevPlace.com:/home/
- B. scp -rp /home/dev dev@staging.DevPlace.com:/home
- C. rsync -avz /home/dev dev@staging.DevPlace.com:/home
- D. rsync -am ssh /home/dev dev@staging.DevPlace.com:/home

Linux Study Guide: Answer sheet

1. Question 1:

    Correct Answer: D. git checkout -b staging

Explanation: This command creates and switches to a new branch named 'staging'. It’s used when the branch does not yet exist.

2. Question 2:

    Correct Answer: C. firewall-cmd --reload

Explanation: Safely reloads runtime firewall rules without modifying permanent settings.

3. Question 3:

    Correct Answer: D. The CPU utilization is high.

Explanation: The 'top' command output shows 97% CPU used by the java process.

4. Question 4:

    Correct Answer: C. mv -n filename /tmp/backup

Explanation: The '-n' flag prevents overwriting existing files, ensuring safe moves.

5. Question 5:

   Correct Answer: D. Use a key to log in as root over SSH.

Explanation: Root login is only allowed using key-based authentication due to 'prohibit-password' setting.

6. Question 6:

   Correct Answer: B. chmod 654 file.txt

Explanation: Sets the correct permissions: rw- for owner, r-x for group, and r-- for others.

7. Question 7:

   Correct Answer: C. steal

Explanation: High steal time indicates CPU cycles are being taken by the hypervisor.

8. Question 8:

   Correct Answer: A. A firewall is blocking access to the SSH server.

Explanation: Port 22 is filtered, indicating a firewall is blocking SSH packets.

9. Question 9:

   Correct Answer: D. ln -s /shared/dev/projects /home/admin/projects

Explanation: Creates a symbolic link from home to the shared project directory.

10. Question 10:

    Correct Answer: A. systemctl mask postfix.service

Explanation: Prevents Postfix from being started manually or automatically.

11. Question 11:

Correct Answer: A. tail -f log.txt

Explanation: Shows real-time updates to a growing log file.

12. Question 12:

Correct Answer: B. echo /home/admin/script.sh | at 9pm March 31

Explanation: Schedules the script execution using the 'at' scheduler.

13. Question 13:

Correct Answer: B. tar tJf archive.tar.xz

Explanation: Lists files in a compressed xz archive.

14. Question 14:

Correct Answer: C. docker network prune

Explanation: Removes all unused Docker networks safely.

15. Question 15:

Correct Answer: C. iptables -A INPUT -v 192.168.10.22 -j ACCEPT

Explanation: Allows traffic from the trusted IP on incoming chain.

16. Question 16:

Correct Answer: A. git fetch

Explanation: Updates the list of branches from the remote repository.

17. Question 17:

Correct Answer: C. YAML

Explanation: The configuration file uses YAML syntax, indicated by indentation and key-value format.

18. Question 18:

Correct Answer: A. sudo killall -HUP httpd

Explanation: Sends a hang-up signal to reload Apache configuration.

19. Question 19:

Correct Answer: A. Encrypted communication between two services in a Kubernetes environment.

Explanation: A core benefit of a service mesh.

20. Question 20:

Correct Answer: A. journalctl --rotate && journalctl --vacuum-time=1s

Explanation: Frees up disk space used by journal logs.

21. Question 21:

Correct Answer: A. ssh -X user@server application

Explanation: Enables X11 forwarding for remote GUI applications.

22. Question 22:

Correct Answer: A. tar -xzf

Explanation: Extracts and decompresses a '.tgz' file.

23. Question 23:

Correct Answer: B. Lee and E. Bob

Explanation: Both have sudo privileges and can execute commands with root access.

24. Question 24:

    Correct Answer: A. dig -x and D. nslookup

Explanation: Both perform reverse DNS lookups to find domains from IPs.

25. Question 25:

    Correct Answer: C. mtr -T -P 443 <remote server IP>

Explanation: Measures TCP packet loss on port 443.

26. Question 26:

    Correct Answer: A. The static entry in /etc/hosts needs to be removed.

Explanation: Overrides DNS resolution and causes connectivity issues.

27. Question 27:

    Correct Answer: A. Creating the /etc/nologin file

Explanation: Blocks all non-root logins.

28. Question 28:

    Correct Answer: A. apt update

Explanation: Refreshes package information to get the latest versions.

29. Question 29:

    Correct Answer: B. The virtual server does not allow VMs running inside the VM.

Explanation: Nested virtualization isn't supported in this setup.

30. Question 30:

Correct Answer: B. sudo chmod 644 /etc/passwd

Explanation: Restores the correct read permissions for user login.

31. Question 31:

Correct Answer: C. ssh-copy-id -i ~/.ssh/id_rsa root@nodeb

Explanation: Installs the SSH public key for passwordless access.

32. Question 32:

Correct Answer: C. rsync -avz /home/dev dev@staging.DevPlace.com:/home

Explanation: Securely and efficiently syncs the development directory with compression.