

## SECTION 1: THEORY (30 Marks)

Answer the following questions briefly.

1. What is PuTTY and why is it used?

Putty is used for allowing remote control over your system , connect them using ssh , password and username

2. Explain the steps to connect a Linux VM using PuTTY.

Collect your ip address using the command ifconfig and ip -a

Then open putty and then allocate the ip address in the space and connect and use the username and password to login

3. Describe the structure of the Linux file system.

/ - root

/bin - essential for programs such as ls , cp , mv

/boot - contains files needed for the booting purpose of the system

/dev - contains the device files such as the hardware components

/etc - configuration files , passwords and authentications

/home - personal user files

/lib - dependencies and libraries file

/tmp - temporary needed files

4. Differentiate between absolute and relative paths.

Absolute path always starts with the / for representing the full path like /var/www/html

Relative path doesn't start with the slash like , cd avengers , cd captain . touch character

5. What does the following permission string mean: -rwxr-xr--?

First rwx represent the full permissions for the user or the owner

Second r-x represents the read and execute permissions for the group

Third r-- represent the read only permissions for the others

6. Explain the difference between chmod, chown, and chgrp.

Chmod - is used to change the permissions of the files

Chown - is used to change the ownership of the user of the file

Chgrp - is used to change the group of the file

7. What is the function of the following commands?

- Man - helps to know all the options present for the command
- Whatis - this is used to list the purpose of the command
- Which - which is used to find the location of the command running from

8. What are wildcards in Linux? Provide two examples with usage.

Wildcard commands are used to help to find an group of file at an faster rate using certain symbols \* ? and etc

Rm -rf \*abc - delete directories and files ending with the name abc

9. Explain the difference between a soft link and a hard link.

Soft links are those which are linked to the file only not to the inode so when you delete the file the link is also destroyed [ ln -s filename ]

Hard links are those where the links are linked to the inode and the links are not destroyed when then files are destroyed too

10. Define a shell. What are the common types of shells in Linux?

Shell is used create automated scripts that are used in the linux to create an script that is used to create an output

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## SECTION 2: PRACTICAL COMMANDS (30 Marks)

Write the Linux command(s) to perform the following tasks.

11. Create a file named `resume.txt` and a directory called `zoho_docs`.

`Touch resume.txt and Mkdir zoho_docs`

12. Navigate from `/home/jash/documents` to `/var/log` using a relative path.

`cd /var and cd log`

13. Find all `.log` files modified in the last 1 day in `/var`.

`find /var -type f -name ".log" -mtime -1`

14. Use `cut` to extract the 3rd column from a colon-separated file.

`awk '{print $3}' /path/to/file`

15. Compress the `/home/jash/project` directory using `tar` and `gzip`.

`Tar cvf userfull.tar /home/jash/projects`

`Gzip cvf userfull.gzip /home/jash/project`

`Gzip cvf userfull.tar.gz`

`Tar xvf userfull.tar /home/jash/projects`

16. Display the number of lines, words, and characters in `data.txt`.

`wc -l data.txt`

`wc -w data.txt`

`wc -c data.txt`

17. Add a user named `zoho_fresher` and set its password to `Admin@123`.

`useradd zoho_fresher`

`passwd zoho_fresher` , set the new password as `Admin@123`

18. List all currently running processes and kill the process with PID 1150.

List all the current process - `ps aux`

Kill the process - `kill < PID >`

19. Schedule a cron job to run a backup script every day at 2 AM.

Crontab -e

00 02 16 7 \* echo " hello there " > crontab.txt

Crontab -l - to list all the commands

20. Display memory and disk usage of the system using a single command.

-du -h is the command to see the disk usage in the file system

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### SECTION 3: REAL-TIME TROUBLESHOOTING & SCENARIOS (20 Marks)

Answer the following real-time situational questions.

21. A user reports their password isn't working. How do you troubleshoot it?

First set an change age for the password so the user might always handle the password change and get hold of the passwords

Then check whether the user exist like checking the /etc/passwd file

Just reset the users password

Check whether the users login shell is in the file /etc/passwd in bin is set to false or nologin change them by using chsh -s /bin/bash username

22. Your system shows 100% disk usage. What steps do you take to resolve it?

Check for unwanted files

Use the df -h | head -10 command to view the most used files and clean them when its not needed

Use the command lsof command to know what file are unwanted but still in use

Delete all the log files that are created using the command `truncate -s 0`

`/path/to/logfile`

Clear cache of the packmanagers those are unwanted

23. A critical service isn't starting with `systemctl`. How do you debug it?

If the `systemctl` is not helping first check the activity of the service

`systemctl status service` - this shows the status of the service if not enabled, enable the service

`systemctl enable service` - this enables the service

if the service still fails then use the process of examining the log files or then check the system logs using `journalctl -u <service_name>`

24. A file `logfile.txt` was deleted, but a hard link `logcopy.txt` remains. What happens?

First from creating the hardlinks - `ln logfile.txt logcopy.txt`

This creates the hardlink in the file with the same inode

Now by deleting the original file the hardlink is not deleted because the hard links always stay in the inode

Now to cover the logfile - just `cp logcopy.txt logfile.txt`

25. You need to send a system-wide maintenance alert. How would you do it?

Using the command `wall`

Just check what and all users are logged in the system by the command `users, who`

Now use the `wall` command - `wall`

Echo "`<message>`"

`Ctrl + D` to launch the message to all the users



## SECTION 4: SHELL SCRIPTING (20 Marks)

Write scripts or answers as instructed.

26. Write a basic shell script to print your name, date, and the current user.

```
#!/bin/bash  
  
a="jash"  
  
b=$(date)  
  
echo " my name is $a"  
  
echo " the date is $b"
```

27. Write an if-then script to check if a file /etc/passwd exists.

```
#!/bin/bash  
  
Clear  
  
If [ -e /etc/passwd]  
  
Then echo " the file exist "  
  
Else  
  
Echo " the file doesn't exist "  
  
fi
```

28. Write a for loop to print even numbers from 2 to 10.

```
#!/bin/bash  
  
For (( i=2 ; i < 10 ; i+=2))  
  
Do  
  
Echo $i  
  
done
```

29. Create a case statement script to display messages for inputs: start, stop, restart.

```
#!/bin/bash

Clear

Echo

Echo " please choose an option "

Echo

Echo " a = start the service"

Echo

Echo " b = stop the service

Echo

Echo " c = restart the service "

Echo

    Read choices

    Case $choices in

a) Systectl start < service_name >
b) Systemctl stop <service_name>
c) Systemctl restart <service_name>
    esac
```

30. What is an alias in shell scripting? Create an alias ll for ls -alh.

```
Alias ll = ls -l
```

```
Alias la = ls -alh
```