1. What is Linux?

Linux is an open-source, Unix-like operating system kernel that powers a variety of systems, including servers, desktops, and embedded devices. It is highly customizable, secure, and efficient. Linux is widely used in enterprise environments, especially for servers due to its stability and flexibility.

2. What is the difference between Hard Link & Soft Link?

- **Hard Link**: It is a direct reference or pointer to the actual data on the disk. Multiple hard links can point to the same file content, and deleting one hard link doesn't remove the data until all hard links are deleted.
- **Soft Link (Symbolic Link)**: It is a reference to another file by name. If the original file is deleted, the soft link becomes broken, and it points to nothing.

3. What is a Kernel in Linux?

The **kernel** is the core component of the Linux operating system. It manages hardware resources, such as CPU, memory, and devices, and allows applications to interact with these resources efficiently. The kernel handles process management, memory management, file systems, and device drivers.

4. How do you create a user account in Linux?

To create a user account, you can use the following command as a root user or with sudo:

```
sudo useradd username
```

To set a password for the user:

```
sudo passwd username
```

5. What is the grep command used for in Linux?

The grep command is used to search for specific patterns or strings in files. It outputs lines from a file or input that match the given pattern. For example:

```
grep 'pattern' filename
```

This command will search for 'pattern' in the 'filename' and display all lines where the pattern occurs.

6. User Creation and Group Membership Task

- **Step 1**: Create user p1:

```
sudo useradd p1
```

Step 2: Add p1 to groups g1, g2, and g3:

```
sudo usermod-aG g1,g2,g3 p1
```

Step 3: Ensure that files created by p1 are automatically assigned group g1: You can set the default group for the files created by using the setgid bit on the directory where files are created. To do this, use:

```
sudo chgrp g1 /directory/path

sudo chmod g+s /directory/path
```

7. Directory Management Task

- **Step 1**: Create a directory /tmp/bg as the root user:

```
sudo mkdir /tmp/bg
```

Step 2: Change the owner of the directory to test and grant necessary permissions:

```
sudo chown test /tmp/bg
```

This allows test to create and delete files and add content to the directory.

8. How to identify and terminate a process consuming excessive CPU resources?

- Use the top or htop command to identify processes consuming high CPU:

```
top
```

This will display real-time process information, including CPU usage.

- Once you identify the problematic process, note its PID (Process ID), and terminate it using the kill command:

```
kill-9 PID
```