Q1. Explain what the following commands do (with examples) and practice them:

- **lockfile**
  The lockfile command is used to create semaphore files. These files act as simple locks that prevent multiple processes from simultaneously accessing a shared resource or critical section.
  ```
  lockfile /tmp/my_lock_file.lock
  ```

- **cksum**
  Prints CRC checksum and byte counts of each FILE.
  ```
  cksum /home/zainab/Desktop/CEW-OEL/main.c
  ```

- **comm**
  Compares two sorted files line by line.
  ```
  comm file1.txt file2.txt
  ```

- **csplit**
  Splits a file into sections determined by context lines csplit myfile.txt 'a'

- **chattr**
  Changes file attributes on a Linux file system chattr +i myfile.txt

- **touch**
  Changes file timestamps to current time touch myfile.txt

Q2. What do the following do:

- **cat ch1**
  Prints whatever is mentioned in the file cat

- **cat ch1 ch2 ch3 > "your-practical-group"**
  Concatenates the contents of three files (ch1, ch2, and ch3) into a new file named "your-practical-group".

- **cat note5 >> notes**
  Appends the content of note5 to the end of the file named notes.

- **cat > temp1**
  This command is used to create or overwrite the content of a file named temp1.Whatever text we give to it after this command is overwritten in the file temp1

- **cat > temp2 << "yourname"**
  This command creates or overwrites a file named temp2 and allows you to input multiple lines of text interactively. The content input continues until you type a line that matches the specified delimiter, in this case, "yourname". The delimiter is used to signal the end of the input.

Q3. Practice the following commands and explain each:

- **cpio**
  The `cpio` command is used to copy files to and from archives. It's often used in combination with `find` to archive or copy files.

- **sort**
  The `sort` command is used to sort lines of text files. It can be used to sort files or the output of other commands.

- **fuser**
  The `fuser` command is used to identify processes using files or sockets. It can be helpful to find which processes are accessing a particular file or device.

- **file**
  The `file` command is used to determine the file type of a file. It examines the content and provides information about the file.

Q4. Differentiate between cp and cpio command?

The `cp` command is used for copying files and directories from one location to another. The `cpio` command is used for creating or extracting archives. It can copy files to or from an archive, making it suitable for backup purposes.

Q5. What does the z option of the tar command do? Explain with examples.

Tar is an archiving utility. It's -z option compresses or decompresses the archive through gzip.

Example:

```
tar -czvf archive.tar.gz directory_to_compress
```

- `-c`: Create a new archive
- `-z`: Compress the archive using gzip
- `-v`: Verbose mode (display progress)
- `-f`: Specify the name of the archive file

This command compresses the contents of directory_to_compress into a tar archive named archive.tar.gz.

Q6. Write two commands to take the backup of your home-folder and all sub-folders. The destination folder should be /home/bkup. NOTE: size of backup should be smaller than original folder.

- Using gzip compression:
  ```
  tar -czvf /home/bkup/home_backup.tar.gz /home/zainab
  ```

- Using bzip2 compression:
  ```
  tar -cjvf /home/bkup/home_backup.tar.bz2 /home/zainab
  ```

Q7. What is the difference between the permissions 777 and 775 of the chmod command?

- The 777 permission allows complete read, write and execute rights to the owner, groups and others.

- The 777 permission allows complete read, write and execute rights to the owner and groups, but only read and execute command to others.