Diciembre-2020

1. The execution of the following code generates at least three processes P1, P2 and P3:

```
...
pipe(fd);/*pipe1*/
pipe(fd2);/*pipe2*/
if(fork() != 0){
  /***Proceso P1 ***/
  dup2(fd[1],STDOUT_FILENO);
  close(fd[0]); close(fd[1]);
  dup2(fd2[0],STDIN_FILENO);
  close(fd2[0]);
close(fd2[1]);
  /* process table P1*/
}else{
  /***Proceso P2 ***/
  dup2(fd[0],STDIN_FILENO);
  close(fd[0]); close(fd[1]);
  pipe(fd); /*pipe3*/
  if(fork() != 0){
    close(fd2[0]);
    close(fd2[1]);
    dup2(fd[1],STDOUT_FILENO);
    close(fd[0]);
    close(fd[1]);
    /* process table P2*/
  }else{
     /***Proceso P3 ***/
     dup2(fd[0],STDIN_FILENO);
     close(fd[0]);
     close(fd[1]);
     dup2(fd2[1],STDOUT_FILENO);
     close(fd2[0]);
     close(fd2[1]);
    /* process table P3*/
  }
 }
...
```

a) Write the content of the file descriptor tables for processes P1, P2 and P3, in the code points marked as /*process table Pi*/.

b) Explain the relationship between P1, P2 and P3 as well as the redirection scheme derived from executing the code.

1	

Diciembre 2020

1. The following listing is the contents of a directory on a POSIX system:

```
drwxr-xr-x   2 user1     grpa              4096 ene  8     2013  .
drwxr-xr-x  11 user1     grpa              4096 ene 10     14:39 ..
-rwsr--r-x   1 user1     grpa           1139706 ene  9     2013  borrar
-rw-------   1 user1     grpa            634310 ene  9     2013  fich
lrwxrwxrwx   1 user1     grpa                 3 ene  9     2013  dat→fich
```

Where borrar is a program that removes a file passed as an argument.

a) Justify if user user2 of the gprb group can delete or not the file fich by executing in that directory the command:

$ ./borrar file

b) Justify if the user user2 of the gprb group can create a file of type link in this directory executing the order:

$ ln -s borrar newborrar

1	a)
	b)

2 The following listing is the contents of a directory on a POSIX system:

```
drwxr-xr-x   2 user1     grpa              4096 ene  8     2013  .
drwxr-xr-x  11 user1     grpa              4096 ene 10     14:39 ..
-rwxr-sr-x   1 user1     grpa           1139706 ene  9     2013  cambia_claves
-rw-------   1 user1     grpa            634310 ene  9     2013  claves_web
-rw----rw-   1 user1     grpa            104157 ene  9     2013  claves_impr
-rw-rw----   1 user1     grpa            634310 ene  9     2013  claves_sala
```

Where **cambia_claves** is a program that allows to edit and modify the content of the keys stored in the data files: **claves_web, claves_impr and claves_sala**. Fill in the table, indicating in case of success which are the permissions that are computed and, in case of error, which is the permission that fails and why.

2

Usuario	**Grupo**	**Orden**	**¿Funciona?**	**Observaciones**
user3	grpb	`./cambia_clave claves_web`		
user2	grpa	`./cambia_clave claves_impr`		
user2	grpa	`./cambia_clave claves_sala`		
user3	grpb	`./cambia_clave claves_sala`		

Diciembre-2020

1. A disk with a capacity of 8GB, is formatted with a version of MINIX with sizes different from the standards. The sizes used in the formatting are :

- Block size = 2KBytes
- Zone Size = 20 blocks = 1 zone
- Pointers to Zone are 32bits = 4Bytes
- The size of the i-node is 64 bytes (7 direct pointers, 1 indirect, 1 double indirect).
- Each directory entry occupies 32 bytes.
- The boot block and the superblock requires 1 block each
- When formatting, space has been reserved in the header for 4096 i-nodes
- The scheme of the different elements of the disk is as follows

Boot	Super block	Node-i bitmap	Zone bitmap	Nodes- i	Data zones

It is requested:

a) Find the number of blocks that each element of the header occupies: i-node bitmap, zones bitmap and i-nodes.

b) Compute the block that corresponds to the first Data Zone as well as the number of Data Zones.

c) Suppose that on this disk there is only one directory, the root directory, which contains 10 regular files,

c1) Indicate the number of data zones occupied by the root directory

c2) Assume in addition that each of the regular files contains information that occupies 50KBytes and indicate in a justified way the number of occupied data zones for this case, take into account both the data and the metadata of the file.

	a)
	b)
	c1)
	c2)