INFO 324
Operating System II

Problem I   **6 points**

Draw the graph generated by the following piece of code:

```
if (fork())
        fork() && (fork() || (fork() && fork()));
else
        fork() || (fork() && fork());
sleep(5);
```

Problem II   **10 points**

Write a C program under UNIX where a parent process executes indefinitely as the following:

Each time, the parent **P** creates a child process **F**, and then the behavior of the two processes is as follow:

- The parent process **P** wait a time t before sending to **F** a signal requesting the child to end its work.
- After its creation, the child **F** must create indefinitely child processes that end immediately. Upon receiving the signal sent by the parent **P**, the child process **F** must communicate to the parent the number of child processes he had created and exit.
- The parent must display the value sent by **F**

Problem III   **14 points**

Write a C program under UNIX where a parent process creates 10 child processes. Then parent and Childs run as follows:

- The parent must read from standard input an integer N, and writes in a pipe N character 'm'.
- The 10 child processes start in a race to read the characters sent by the parent.
- At the end of the race, each child returns to the parent the number of characters he had read. The parent must display the PID of the winner child, i.e., one who has read the largest number of characters from the N characters sent.

PS: Think about the way to resolve the deadlock that may occur when the N characters are read, and the child processes are still waiting to read from the pipe.

Good Luck