

## CL 2006 Operating Systems Lab

**Time: 20 minutes**

**Quiz 3**

**Marks: 30**

**Name:** \_\_\_\_\_

**Roll #:** \_\_\_\_\_

### **Question 1 [15 Marks]**

Consider the following scenario and answer the following questions:

A process has three threads T1, T2, and T3, and its code does not contain any `exec*()` commands. The thread T1 opens 3 files and thread T2 creates a pipe. After these actions,

1. Thread T1 executes a `fork()` command.
2. Thread T2 executes a `fork()` whose child immediately calls `execvp()` to execute a single threaded program.
3. Thread T3 closes the three files and then terminates.

Note that all processes use Pthreads.

- ☐ How many different processes are running? Why? [3 marks]
  
  
  
  
  
  
  
  
  
  
- ☐ How many different programs are being executed? Why? [3 marks]
  
  
  
  
  
  
  
  
  
  
- ☐ How many open file descriptors are there? Why? [5 marks]
  
  
  
  
  
  
  
  
  
  
- ☐ Would any of the above answers change if the `execvp()` call was not made? If so, explain how. [3 marks]

- ☐ Thread T3 makes a system call that causes all threads to terminate. Which system call could it be?  
[1 mark]

### **Question 2 [15 Marks]**

In pseudocode format, explain how would you create a multithreaded process in which two threads play Tic-tac-toe with each other?