	MIDTERM EXAMINATION FALL 2006 CS604 - OPERATING SYSTEMS	Marks: 60 Time: 60min

StudentID/LoginID: _____

Student Name: _____

Center Name/Code: _____

Exam Date:

Please read the following instructions carefully before attempting any question:

1. **This examination is closed book, closed notes, closed neighbors.**
2. **Answer all questions.**
   a. **There is no choice.**
   b. **You will have to answer all questions correctly in this examination to get the maximum possible marks.**
3. **Do not ask any questions about the contents of this examination from anyone.**
   a. **If you think that there is something wrong with any of the questions, attempt it the best of your understanding.**
   b. **If you believe that some essential piece of information is missing, make an appropriate assumption and use it to solve the problem.**
4. **Examination also consists of multiple-choice questions. Choose only one choice as your answer.**
   a. **If you believe that two (or more) of the choices are the correct ones for a particular question, choose the best**
   b. **On the other hand, if you believe that all of the choices provided for a particular question are the wrong ones, select the one that appears to you as being the wrong.**
5. **All Programming questions should be answered using C language syntax. Errors of will not be considered as errors. So try to only answer the question and put your idea concept using C. Don't use any tool or IDE.**

****WARNING: Please note that Virtual University takes serious note of unfair means.**

Anyone found involved in cheating will get an `F` grade in this course

For Teacher's use only											
Question	1	2	3	4	5	6	7	8	9	10	Total
Marks											

Question No: 1 (Marks: 2) - Please choose one

Consider a UNIX system with **threshold priority** of 125. Assume two processes, P1 and P2, which came into the system at the same time. P1 has a **nice value** of 15 and 'recent CPU usage' 45 ticks. P2 has a nice value of 10 and 'recent CPU usage' 65 ticks. It is time for scheduling. Which of the two processes will be chosen for execution?

- P1 because its recent CPU usage is less than that of P2's and, therefore, its priority is higher than P2's priority.
- P2 because its nice value is smaller than that of P1's.
- P2 because its priority number is smaller than that of
- P1 because its process ID is smaller than P2's process ID.
- None of the given choices.

Question No: 2 (Marks: 2) - Please choose one

What is spooling?

- Ability of an OS to protect jobs from writing into the wrong memory
- Ability of an OS to do long term job scheduling
- Ability of an OS to read jobs from cards onto the disk, and load a new job from disk to empty memory partition
- Ability of an OS to give priority to each job for execution.
- None of the given choices.

Question No: 3 (Marks: 2) - Please choose one

To a computer operating system, a thread

- Trace of system calls made by a process.
- Identifiable computation unit with state executing a
- Input/output stream associated with a
- All of the given choices.
- None of the given choices.

Question No: 4 (Marks: 2) - Please choose one

Which component ensures that a process can execute only within its own address

- I/O device
- Memory-addressing hardware
- Timer
- Virtual memory
- None of the given choices.

Question No: 5 (Marks: 2) - Please choose one

In UNIX, a file descriptor is:

- A positive integer associated with an open file. Its value describes the type of data the file and the file location on disk.
- A positive integer used to index the per process file descriptor table to access an open file's attributes, including its
- A positive integer used to index the per process file descriptor table, which points the inode of the file containing the executable image of the process on
- All of the given choices.
- None of the given choices.

Question No: 6 (Marks: 10)

What are the differences **trap** and **interrupts**? What is the use of each function?

Question No: 7 (Marks: 10)

Given the five processes below with their indicated number of run time units, answer the questions

that follow. Assume processes arrived in numerical order at time

(a) Show the scheduling order for these processes under first-come-first-served, shortest-job and round-
robin scheduling (quantum = 1)

(b) For each process in each schedule above, indicate the wait time (Total time spent in the queue) and
turnaround time.

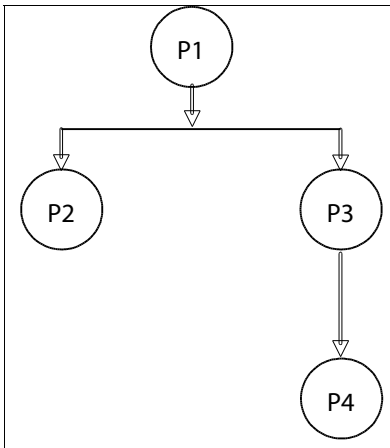
Question No: 8 (Marks: 10)

The following is a solution for the 2-process critical section problem. Is it a good solution? Explain your answer.

Structure for P_i

Question No: 9 (Marks: 10)

Give source code for a C program to implement the following process hierarchy in a UNIX/Linux system.



Question No: 10 (Marks: 10)

Give two reasons, each for the following calls to fail?

- open()
- pipe()
- mkfifo()
- write()
- execlp()