Operating Systems Sample Questions

Inter-Process Communication

1. List any five inter-process communication mechanisms, with a one line description for each?

2. When using a pipe for inter-process communication, why should a process promptly close any unused write descriptors to the pipe? Also give an example of what happens if it doesn't.

3. Let's say a **chain of filters** refers to a series of commands whose standard inputs and standard outputs are linked by pipes. For example,

   "ps -elf | grep bash | more"

   is a chain with three commands.

   In the general case,

   "command1 | command2 | command 3 | ... | command K"

   is a chain of filters with K commands.

   Suppose you were implementing a shell (e.g. csh, bash, tcsh, ksh, etc.), how would you go about supporting a chain of filters with ***arbitrary*** number of commands? Explain. Don't write actual code.

4. What's the difference between byte-stream vs. message oriented communication?

5. How would you redirect the standard input/output of a process from/to a file?

6. Consider pipes and shared memory IPC mechanisms.
   A. Compare the two in terms of <u>(a) data transfer overhead and (b) synchronization overhead.</u>
   B. Under what situation would you choose one IPC mechanism over the other?

7. What is the problem with using process-level signals in a multi-threaded process?