Operating Systems problems — 1st batch

1. Why is the distinction between user mode and kernel mode considered good operating system design? Give an example that illustrates a user process being switched from user mode to kernel mode, and then back to user mode.

2. What are the main differences between a trap and an interrupt? Give an example where, after servicing an interrupt, control is returned to a different process than the one running before the interrupt.

3. Which of the following instructions should be allowed only in kernel mode?

   (a) Disable all interrupts. (Why would this happen?)

   (b) Read the time-of-the-day clock.

   (c) Set the time-of-the-day clock.

   (d) Change the memory image of a process.

4. An I/O-bound program is one that, if run alone, would spend more time waiting for I/O than using the processor. A processor-bound program is the opposite. Suppose a short-term scheduling algorithm favours those programs that have used little processor time in the recent past. Explain why this algorithm favours I/O-bound programs and yet does not permanently deny processor time to processor-bound programs.