Ph.D. Qualification Examination
Operating System (April 2010)

(1) (15%) Please describe the working set model and explain how to use it to prevent thrashing.

(2) (10%) Please describe in details the convoy effect and the Belady's anomaly.

(3) (15%) Please describe FAT and compare it with the linked allocation method.

(4) (10%) Please compare a file system with a swap space's structure.

(5) (15%) What is the difference between computation migration and process migration? Which is easier to implement, and why?

(6) (15%) A file is to be shared among different processes, each of which has a unique number. The file can be accessed simultaneously by several processes, subject to the following constraint: The sum of all unique numbers associated with all the processes currently accessing the file must be less than n. Write a monitor to coordinate access to the file.

(7) (10%) Describe the actions taken by a thread library to context switch between user-level threads.

(8) (10%) What are the advantages and disadvantages of supporting memory-mapped I/O to device control registers?