1. (10)Consider the operation system, implementing time sharing scheduling, and running on the segmentation hardware with demand paging. When a process P1 used up its time quantum, the operation system will change the CPU from P1 to a new process P2. What happen if P2 tries to access a page that was not brought in memory? How does the operation system solve the problem?

2. (5)What is spinlock? Why should we need it?

3. (10)What are the differences between the SCAN disk scheduling, C- SCAN disk scheduling, and LOOK disk scheduling?

4. (5)What are the differences between the RAID 0+1 and RAID 1+0?

5. (5)What is demilitarized zone? Why should we need it?

6. (5)What are the difference between the intrusion-detection system and the intrusion-prevention system?

7. (10) How does a boot-sector computer virus work?

8. (10) The Intel Pentium architecture can provide paging and segmentation. How can the Linux design its memory management strategy on the Intel Pentium architecture?

9. (10)Consider a system with five process P0 through P4, and four resource types A, B, C, and D. Suppose that, at time T0, we have the following resource allocation state:

	Allocation	Max	Available
	ABCD	ABCD	ABCD
P0	0012	0012	2520
P1	0000	1750	
P2	1354	2356	
P3	0632	0652	
P4	0014	0656	

Answer the following question using the banker's algorithm. (a) What is the content of the matrix Need? (b) Is the system in a safe state? (c) If a request from P1 arrives for (0,5,2,0), can the request be granted immediately?

10. (10) In Windows XP, what are the difference between ETHREAD, KTHREAD, and TEB?

11. (10) What operations can be done on processes by an operating system? Please draw a process state transition diagram with these operations labeled on the transition edges.

12. (10) Please compare the following two job scheduling strategies: shortest-job-first vs. shortest-remaining-time. Describe what pros and cons these two strategies have respectively.