

國立交通大學試題紙

一百零一學年度第一次
博士班資格考

科目：作業系統 A

日期：102 年 1 月 31 日 第 1 頁 共 1 頁

請“✓”明 ✓不可看書 可看書

* 請將答案依題號順序寫入答案卷

答題時字跡需工整，否則不予計分。Write your answers legibly; otherwise you will get zero score.

Notice: Write your answers in Chinese or English. However, poor English writing is negative to your grade.

1. (6%) Explain the difference between multiprogramming and time sharing.
2. (6%) In the design and implementation of operating systems, separating policies from mechanisms is an important principle. Explain the benefit of this principle, and give an example.
3. (8%) Are the following process state transitions possible? If yes, give an example.
 - (a) Ready→running
 - (b) Running→waiting
 - (c) Waiting→ready
 - (d) Waiting→running
4. (6%) Consider the many-to-one thread model. Explain why a multi-threaded process blocks if anyone of its thread is performing a blocking I/O.
5. (6%) Explain why multilevel-feedback queue CPU scheduling algorithm gives I/O-bound processes higher priorities and smaller time quantum.
6. (6%) In uni-processor systems, disabling interrupts is a simple means to implement critical sections. But in multi-processor systems this approach does not work. Explain why.
7. (6%) Which of the following operations can be made safely without incurring deadlocks?
 - (a) Increasing the total amount of resources
 - (b) Decreasing the degree of multiprogramming
 - (c) Increase processes' demand of resources
8. (6%) Consider a paging system that uses a single-level page table with a small TLB. Let the hit ratio of the TLB be p . Let the memory access time and the TLB access time be 1 and t , respectively. Calculate the effective access time.

◎請用深黑色鋼筆或原子筆出題

命題老師簽名：

科目:作業系統 B

日期: 102 年 1 月 31 日 第 1 頁 共 1 頁

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答題時字跡需工整，否則不予計分。Write your answers legibly; otherwise you will get zero score.

1. (8%) Given the reference string of page accesses: 1 2 3 4 2 3 4 1 2 1 1 3 1 4 and a system with three page frames.
 - a、 What is the final configuration for the given reference string by using the FIFO algorithm?
 - b、 What is the final configuration for the given reference string by using the LRU algorithm?
 - c、 What is the number of page faults for the given reference string by using the FIFO algorithm?
 - d、 What is the number of page faults for the given reference string by using the LRU algorithm?
2. (6%) What is the difference between an operating system that implements mandatory locking and one that implements advisory file locking?
3. (6%) Explain how a snapshot is taken in the WAFL file system.
4. (8%) Consider a disk queue holding requests to the following cylinders in the listed order: 116, 22, 3, 11, 75, 185, 100, 87.
 - a、 Using the SCAN scheduling algorithm, what is the order that the requests are serviced, assuming the disk head is at cylinder 88 and moving upward through the cylinders?
 - b、 Using the FCFS scheduling algorithm, what is the order that the requests are serviced, assuming the disk head is at cylinder 88 and moving upward through the cylinders?
 - c、 Using the SSTF scheduling algorithm, what is the order that the requests are serviced, assuming the disk head is at cylinder 88 and moving upward through the cylinders?
 - d、 Using the C-SCAN scheduling algorithm, what is the order that the requests are serviced, assuming the disk head is at cylinder 88 and moving upward through the cylinders?
5. (8%) Describe the concept of a stateless file server.
6. (6%) Please briefly describe a distributed method for generating unique timestamps?
7. (8%) What are two different approaches to data migration?