

# 國立交通大學試題紙

一百零五學年度第一次  
博士班資格考

科目：作業系統 A

日期：106 年 1 月 19 日 第 1 頁 共 1 頁

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\* 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.

1. [10pts] We want to have two file systems on a computer system. There are two choices:
  - A. Install two 1TB hard drives. Each drive has a file system.
  - B. Install a 2TB hard drive and create two 1TB partitions on it. Each partition has a file system.

Assuming the hard drives have similar seek times and I/O throughput ratings, compare the two choices in terms of their performance and reliability.
2. [10pts] If we use interrupts to process the incoming packets on a network interface card, the CPU may become fully occupied by the interrupt service routines when a huge amount of network traffic hits the interface card. Will this be a problem? If yes, how can we address the problem?
3. [10pts] Outline the conditions, with which the use of RAID-0 disk configuration will significantly improve I/O performance.
4. [10pts] If we want to shrink the size of a disk partition, what might be the challenges?
5. [10pts] Describe the key steps in a buffer-overflow attack. How can a programmer guard against buffer overflows?

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10 pts for each question

1. What are synchronous I/O and asynchronous I/O? Please explain their benefits and drawbacks.
2. Describe at least three criteria of evaluating CPU scheduling algorithms.
3. Disabling interrupt is a very simple solution of the critical section problem, but it also has several drawbacks and limitations. Discuss these disadvantages.
4. Discuss the pros and cons of the many-to-one and one-to-one thread models.
5. In demand paging, the logical address space of all processes can be much larger than the physical memory size. Does that mean thrashing always happen? Why or why not?