

科目：作業系統(A)

日期：99年7月29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.

1. [7 points] Please propose a method capable of selecting and booting one of two large operating systems installed on a modern PC.
2. [12 points] Please write and explain your pseudo codes for efficient multiplication of two 15×15 matrices A and B with 4 threads. (Hint: you may use semaphores for synchronization)
3. [10 points] Suppose you plan to design a multiple-purpose workstation for both interactive and batch jobs. Please propose your algorithm for process/thread scheduling.
4. [6 points] Please propose a method to prevent system deadlock due to circular wait. What are the disadvantages of this method?
5. [8 points] Consider a demand-paging system with a device utilization profile: CPU (10%), disk (96%), printer and others (5%). Please diagnose this situation and propose how to improve its CPU utilization. (Hint: if the information is insufficient, you may indicate and include other information for your diagnosis)
6. [7 points] Please compare the advantages and disadvantages of hierarchical paging and inverted paging systems.

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7. [12 points] Describe the pros of cons of the following file-system designs
 - (a) Log-structured file systems
 - (b) Journaling file systems
 - (c) Extent-based file systems
8. [10 points] Advanced operating systems combine disk buffer cache and virtual-memory page cache. Explain why.
9. [8 points] Suppose that the one-year *failure rate* of one disk is p . Calculate the one-year *failure rates* of under the following RAID structures with n disks:
 - (a) RAID-0 (block striping)
 - (b) RAID-1 (n-way replication)
 - (c) RAID-5 (block striping with single parity)
 - (d) RAID-6 (block striping with dual parity)
10. [10 points] How the sandbox mechanism in Android operating systems protects applications from destroying each other's data?
11. [10 points] Describe how timing-sensitive systems benefit from token-bus networks.