

系所組別： 工程科學系乙組

考試科目： 系統程式

考試日期： 0307，節次： 1

※ 考生請注意：本試題 可 不可 使用計算機

1. What is the purpose of system calls? What is the remote procedure call? (10%)

2. Suppose that a three-level storage hierarchy, i.e., a cache, main memory, and a disk, is used in a computer. If a referenced word is in the cache, 30ns are required to access it. If it is in the main memory but not in the cache, 60ns are needed to load it into the cache, and then the reference is started again. If the word is not in main memory, 2ms are required to fetch the word from disk, followed by 60ns to copy it to the cache, and then the reference is started again. The cache hit ratio is 0.9 and the main-memory hit ratio is 0.6. What is the average time in nanoseconds required to access a referenced word on this computer? (20%)

3. Please explain that there may not be only one fixed criterion to evaluate the performance of various computer systems. Specifically, illustrate the possible performance metrics for desktop computers, network servers, and handheld computers. (20%)

4. Consider a system consisting of four resources of the same type that are shared by three processes, each of which needs at most two resources. Show that the system is deadlock free. (15%)

(背面仍有題目,請繼續作答)

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5. Consider the following segment table:

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580

What are the physical addresses for the following logical addresses?

- (A) 1,10 (5%)
- (B) 2,500 (5%)
- (C) 3,400 (5%)

6. Given memory partitions of 100K, 500K, 200K, 300K, and 600K (in order), how would each of the First-fit, Best-fit, and Worst-fit algorithms place processes of 212K, 417K, 112K, and 426K (in order)? Which algorithm makes the most efficient use of memory? (20%)