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| 系級 | 資訊科學系碩士在職專班 | 考試時間 | 100 分鐘 |
| 科目 | 計算機系統       | 本科總分 | 100 分  |

1. T rue / F alse (Briefly state the reason, if false; 15%)

- (1) To carry out multiprocessing, a computer must have two or more CPUs.
- (2) To minimize the number of page faults, need smaller pages.
- (3) Response time is more predictable in preemptive CPU scheduling than non-preemptive CPU scheduling.
- (4) All of the related files of operating system are actually stored in the primary storage area of a computer.
- (5) Time sharing (or interactive) systems generally use preemptive CPU scheduling.

2. What are advantages and disadvantages of implementing an operating system (e.g. UNIX) in a higher-level programming language such like C, or C++? (10%)

3. Explain the similarities and differences between RMI (Remote Method Invocation) and CORBA (Common Object Request Broker Architecture). (10%)

4. List the MAC (Medium Access Control) techniques for solving the link contention of token passing network and Ethernet network. Also, under what circumstance is a token ring network more effective than an Ethernet network? (10%)

5. What are the four necessary conditions needed before deadlock can occur? Also, list three possible ways to breaking an existing deadlock. (10%)

背面尚有試題

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6. Following questions are related to *memory management*: (15%)

(1) Differentiate “*frame*” and “*page*”. Also, How many frames are needed for each page in simple paging and demand paging, respectively? (7%)

(2) How many swaps are needed for pure page replacement? Also, list three ways of resolving the problem of no free frame. (8%)

7. Following questions are related to *CPU scheduling*: (15%)

(1) What is the main problem in a Priority scheduling? Also, propose and describe the strategy to solve this issue. (8%)

(2) What is the main problem in a RR (Round Robin) scheduling? How are Priority and SJF (Shortest Job First) related? (7%)

8. Consider the following pages reference string in a demanding paging:

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6 (15%)

(1) How many page faults would occur for the following replacement algorithms assuming 5 frames? (12%)

- FIFO
- LRU
- Optimal

(2) Which algorithm is best under this situation? (3%)