

# 淡江大學八十八學年度碩士班招生考試試題

系別：資訊工程學系

科目：計算機組織與系統

本試題共 / 頁

## O.S. Part: (50%)

一、Consider the following page reference string: (20%)

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.

How many page faults would occur for the following replacement algorithm, assuming five or seven frames? Remember that all frames are initially empty, so your first unique pages will all cost one fault each.

- LRU algorithm
- LFU algorithm
- Second-chance algorithm
- Optimal algorithm

二、The Banker's algorithm is being run in a system with  $m$  resource classes and  $n$  processes. In the limit of large  $m$  and  $n$ , the number of operations that must be performed to check a state for safety is proportional to  $m^a n^b$ . What are the values of  $a$  and  $b$ . (10%)

三、The architecture of Microsoft Windows NT 4.0 is a layered system. The main layers are the hardware abstraction layer, the kernel layer, and the executive layer that run in protected mode. Please describe the component of the executive layer. (20%)

## Computer Architecture Part: (50%)

一、The architecture of Pentium Pro has a special unit for Floating-point computations. What is the special unit and please to describe the structure of the special unit. (3%, 15%)

二、A cache is being designed for a computer with  $2^{32}$  bytes of memory. The cache will have 2K slots and use a 16-byte block. Compute for both an associative cache and a direct-mapped cache how many bytes the cache will occupy. (20%)

三、Please explain the terms: (3% of each, total is 12%)  
(a). SISD, (b). SIMD, (c). MISD, (d). MIMD