

國立屏東教育大學 101 學年度研究所碩士班入學考試

計算機概論試題

(資訊科學系碩士班 資訊科學組)

- ※請注意：1.本試題共三頁。
2.答案須寫在答案卷上，否則不予計分。

一、選擇題 (單選題，每題 4 分，共 32 分)

- 下列何種結構，不是網路結構的一種
(A)星狀結構 (B)分散型結構 (C)環狀結構 (D)網狀結構
- We have the 3 frames and the page reference string : 5, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 5, 0, 1. How many page faults for OPT and LRU replacement?
(A) 9 and 15 (B) 10 and 12 (C) 7 and 12 (D) 9 and 12
- 若要在一個含 N 個資料的平衡二元樹中，尋找一個特定的資料，所需要的平均時間為
(A) $O(N)$ (B) $O(N^2)$ (C) $O(\log N)$ (D) $O(N \log N)$
- 下列關於網路傳輸協定的敘述何者正確
(A) TCP 是一種連接導向的、可靠的、基於位元組流的傳輸層通信協議
(B) IP 是一種提供可靠的資料封包交換網路的網路層通訊協議，主要是負責主機間網路封包的定址與路由
(C) ARP 是用來偵測網路狀態的協定主要用來報告網路上的錯誤狀況
(D) ICMP 的基本功能就是通過目標設備的 IP 位址，查詢目標設備的 MAC 地址，以保證通信的順利進行
- 同位檢查是一種糾錯方法，下列那個字元是錯誤的偶同位檢查碼
(A) 01100101 (B) 11010001 (C) 01010110 (D) 11010101
- 下列哪一個是 CPU 指令週期的正確順序?
(A)解碼、擷取、執行、儲存 (B)擷取、儲存、解碼、執行
(C)擷取、解碼、執行、儲存 (D)擷取、解碼、儲存、執行
- 就 CPU 存取資料而言，下列那種儲存的速度最快?
(A)硬碟 (B)主記憶體 (C)快取記憶體(Cache) (D)暫存器(Register)
- 下列何者不是作業系統的功能
(A)系統資源的分配 (B)檔案系統的管理
(C)資源工作的安排 (D)資料庫的管理

二、問答題 (共 68 分)

1. What is the output of the following program? (8 分)

```

#include <stdio.h>

void a( void );
void b( void );
void c( void );
int x = 1;
int main()
{
    int x = 5;
    printf("o: %d\n", x);
    {
        int x = 10;
        printf("i: %d\n", x);
    }
    a();
    b();
    c();
    b();
    c();
    printf("o: %d\n", x);
    return 0;
}

void a( void )
{
    int x = 20;
    ++x;
    printf("a: %d\n", x);
}

void b( void )
{
    static int x = 15;
    ++x;
    printf("b: %d\n", x);
}

void c( void )
{
    x *= 5;
    printf("c: %d\n", x);
}
    
```

2. Suppose that the following process arrive for execution at the times indicated. Each process will run the list amount of time.

- (a) Assume that nonpreemptive scheduling is adopted. What is the average turnaround time and average waiting time for these processes with the FCFS scheduling algorithm? (5 分)
- (b) Assume that preemptive scheduling is adopted. What is the average turnaround time and average waiting time for these processes with the SJF scheduling algorithm? (5 分)

Process	Burst Time (s)	Arrival Time (s)
P1	6	0
P2	3	1
P3	7	2
P4	4	3

3. In what way could TCP be considered a better protocol for implementing the transport layer than UDP? In what way could UDP be considered better than TCP? (10 分)

4. The following terms relate to how the operating system manages multiprogramming. Describe the part each plays in this process. (20 分)
(a) Process (b) Process management (c) Memory management (d) CPU scheduling
5. Four processors arrive in the steady state at essentially the same time but in the following order and with the specified service time:

Process	P1	P2	P3	P4
Service time	120	60	180	50

Suppose the CPU executes the processes at time 0.

- (a) Draw a Gantt chart that shows the completion times for each process using shortest-job-first scheduling.(10 分)
- (b) Draw a Gantt chart that shows the completion times for each process using round-robin scheduling with a time slice of 60?(10 分)