

# 國立虎尾科技大學九十八學年度研究所（碩士班）入學試題

所別：資訊管理系研究所

科目：考試科目 1（計算機概論）

## 注意事項：

- (1) 本試題共有選擇題二十題，每題三分，共六十分；問答題四題，共四十分，合計一百分。  
(2) 請依序作答在答案卷上並註明題號。

### 一. 單選題：(每題 3 分，共 60 分)

1. Assume the burst time for Job1、Job2、Job3、Job4、Job5 is 6、4、10、4 and 2, respectively. If CPU scheduling uses Shortest-Job-First algorithm, then average turnaround time is (A) 17.2 (B) 5.2 (C) 12 (D) 10 (E) none of the above
2. Which kind of memory contains a copy of a portion of main memory to speed up execution? (A) ROM (B) SCSI (C) RAM (D) CACHE (E) none of the above
3. Which of the following method is not used for disk space allocation? (A) Distributed allocation (B) Contiguous allocation (C) Indexed allocation (D) Linked allocation. (E) none of the above
4. Consider the following page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2 for a memory with three frames. How many page faults would occur for the first-in, first-out (FIFO) replacement algorithm? (A) 9 (B) 10 (C) 11 (D) 12 (E) none of the above
5. The structure query language (SQL) provides three types of command involving data definition (DDL), data manipulation language (DML) and data control language. Which of the following commands are DML? (1) Create (2) Grant (3) Drop (4) Select (5) Commit (6) Delete (7) Insert (A) (1)(3) (B) (2)(5) (C) (4)(6)(7) (D) none of the above
6. In database, the process to remove redundant data from table structure is called (A) structuration (B) hierarchy (C) normalization (D) none of the above
7. Which operation in the relational database model allows us to extract required columns and place the result in a new relation? (A) UPDATE (B) PROJECT (C) INSERT (D) JOIN (E) none of the

above

8. Which mechanism of an operating system can achieve multiprogramming? (A) Batch (B) Parallel (C) Time-sharing (D) Distribution (E) none of the above
9. Which DBMS as follows belongs to personal scale DBMS? (A) Oracle (B) Access (C) Sybase (D) DB2 (E) none of the above
10. In a relational database, which of the following description is correct? (A) each row has a primary key and each column has a unique name (B) each column and each row has a primary key (C) each row has a unique name and each column has a primary key (D) each row and each column has a unique name (E) none of the above
11. 用來將 name address 轉成 IP address 的是 (A)NIS (B)DNS (C) NFS (D)NII。
12.  $(1.75)_8 + (2.63)_8$  以 10 進制表示為：(A)4.75 (B)4.38 (C)4.625 (D)以上皆非。
13. 採用 even-parity error detection 去檢查傳送來的 7 位元資料，下列何者有錯誤？(A)10101010 (B)11111111 (C)11100011 (D)11110000。
14. 某程式在電腦中執行共需 100 秒，其中乘法指令共花掉 80 秒。依據 Amdahl's Law，應該提升乘法器幾倍速度，以使得某程式執行時間為原來的 1/4？(A)4 倍(B)8 倍 (C)16 倍 (D)32 倍。
15. 一個指令循環要花 40ns，其中 IF(10ns)、ID(5ns)、EXE(10ns)、MEM(10ns)、WB(5ns)。若有 100 個指令，管線作法(Pipelining)較傳統作法速度提升多少倍？(A)4.85 (B)2.85 (C)3.85 (D)5.85。
16. The definition of the recursive function  $F(i, j)$  is as follows:  
(A) 
$$F(i, j) = \begin{cases} j+1, & \text{if } i = 0 \\ F(i-1, j), & \text{if } j = 0 \\ F(i-1, F(i, j-1)), & \text{if } i \neq 0, j \neq 0 \end{cases}$$
  
(B) What is the value of  $F(2, 2)$ ? (A) 7 (B)8 (C)9 (D)10 (E)none of above
17. In the following sorting algorithms, the average performance of which is NOT  $O(n \log n)$ ?  $n$  is the number of element. (A)heap sort (B)quick sort (C)merge sort (D)bubble sort

18. If the hashing function is  $H(X) = X \bmod 13$ , then which of the following has a collision with  $H(31)$ ? (A)  $H(18)$  (B)  $H(41)$  (C)  $H(55)$  (D)  $H(62)$  (E) none of above
19. Which of the following is the algorithm that merge-sort uses? (A) divide-and-conquer (B) search (C) Greedy method (D) branch-and-bound (E) none of above
20. Let  $X_1, X_2, \dots, X_{11}$  be the postorder traversal of a binary tree which has the following information.  
 (A) Its inorder traversal: JKDBEAHFHCGI  
 (B) Its preorder traversal: ABDJKECFHGI  
 (C) Then,  $X_3 = ?$  (A) C (B) F (C) D (D) I (E) none of above

二、問答與證明題：(每題 10 分，共 40 分)

1. 172.20.0.0/19 共分成幾個子網路？每個子網路有幾個可用的 IP？
2. 請圖示說明 OSI 模型與 DoD 模型的對應關係。
3. Consider the following C program. Show and explain what result will be printed?

```
#include <stdio.h>
#include <stdlib.h>
int main(void)
{
    int num[]={18,44,32,62,19};
    int *p1,*p2;
    p1=p2=num;

    *p1++;
    printf("*p1=%d\n",*p1);

    (*p2)++;
    printf("*p2=%d\n",*p2);

    system("pause");
    return 0;
}
```

4. Show that time complexity of  $6n^3 / (\log n + 1)$  is  $O(n^3)$ .