

國立臺北科技大學九十九學年度碩士班招生考試

系所組別：3140 土木與防災研究所丁組

第一節 計算機概論 試題

第一頁 共二頁

注意事項：

1. 本試題共兩大題，配分共 100 分。
2. 請標明大題、子題編號作答。不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。
4. 第二大題需以整齊文字撰寫。字體應力求清晰，不得模稜兩可，亦不得潦草。

一. 單選題 (共 22 題，每題 4 分，共 88 分)

(單選題答案為 A、B、C，或 D。不得回答數字。)

1. Choose the best description about GIS (Geographic Information System). (4 分)
 - (A) It is any system that manages, analyzes, and presents information that is linked to geographic data within specific area or space.
 - (B) It is any system that receives signals from satellites.
 - (C) It is any system that sends signals to satellites.
 - (D) It is any system that represents information through geometric shapes.
2. What is a reasonable measurement accuracy of today's civil handheld global positioning system (GPS) device? (4 分) (A) 0.01 mm (B) 10 m (C) 1 kg (D) 1000 tons
3. Choose the best description about Unix. (4 分)
 - (A) It is a descendant of the Windows XP operating system.
 - (B) It is an operating system originally developed in 1960s.
 - (C) It is a popular geographic information system for civil engineers.
 - (D) It is a popular relational database designed for hazard mitigation.
4. Choose the best definition of a database management system (DBMS). (4 分)
 - (A) A system which compresses data
 - (B) A system which sends centralized data to distributed cloud computing servers
 - (C) A system which compiles programs written in C++
 - (D) A system which creates, deletes, maintains, and uses data in a database
5. What is Structured Query Language (SQL)? (4 分)
 - (A) A language that allows users to draw pictures
 - (B) A language that allows users to manipulate data in a database
 - (C) A language that allows users to operate data in an object-oriented model
 - (D) A language that prevents hackers' accessing protected data in a database

6. For relational databases, what is normalization? (4 分)
 - (A) A process to compress data so that they have the same length
 - (B) A process to simplify data format so that they are recognizable for normal users
 - (C) A process to ensure the data within tables contains the least amount of duplication
 - (D) A process to verify the data so that they are accessible by normal users
7. Which of the following systems provides the most efficient random access to individual data items? (4 分)
 - (A) Main memory (B) Magnetic disk (C) Optical DVDs (D) LAN
8. Which of the following is **not** associated with object-oriented programming? (4 分)
 - (A) Inheritance (B) Polymorphism (C) Encapsulation (D) Resolution

再次提醒：單選題答案為 A、B、C，或 D。不得直接回答數字。

9. What is the **jj** after running the following C/C++ statements? (4 分)

```
int ii = 0, jj = 0;
for (ii = 1, ; ii <= 5; ii++)
    jj = jj + ii;
```

- (A) 1 (B) 5 (C) 6 (D) 15

10. What is the **x** after running the following C/C++ statements? (4 分)

```
int ii = 0, jj = 0, x = 0, y = 0;
for (ii = 2; ii <= 3; ii++)
    for (jj = 4; jj <= 5; jj++)
    {
        x = x + y + ii;
        y = x + jj;
    }
```

- (A) 15 (B) 23 (C) 63 (D) 68

11. What is the **invp[3]** after running these C/C++ statements? (4 分)

```
int ii, perm[] = {4,2,1,0,3}, invp[] = {0,0,0,0,0};
for (ii = 0; ii < 5; ii++)
    invp[ perm[ii] ] = ii;
```

- (A) 1 (B) 2 (C) 3 (D) 4

12. What is the **DD[0]** after running all statements in the main program in Table 1? (4 分)
 - (A) 101 (B) 102 (C) 103 (D) 104
13. Following the above question, what is the **EE[2]**? (4 分)
 - (A) 103 (B) 104 (C) 82 (D) 83

```
Table 1: a C/C++ program
void tsubl(int FF[], int GG[], int HH[],
           int KK[], int MM[], int N )
{
    for (int ii = 0; ii < N; ii++) {
        KK[ii] = FF[ HH[ii] ];
        MM[ii] = GG[ HH[ii] ];
    }
}

void main(void) {
    int AA[] = {101, 102, 103};
    int BB[] = {81, 82, 83};
    int CC[] = {2, 0, 1};
    int DD[3], EE[3];
    tsubl( AA, BB, CC, DD, EE, 3 );
}
```

注意：背面尚有試題

14-22. Complete the C++ program shown in Table 3 by choosing a proper answer for each blank. This program reads 12 numbers in a text file named `Temperature.txt` as shown in Table 2. It then calculates the average and standard deviation of these numbers. The average (`Avg`) and standard deviation (`Std`) are defined as

$$Avg = \frac{\sum_{i=1}^{12} T_i}{12} \quad \text{and} \quad Std = \sqrt{\frac{\sum_{i=1}^{12} (T_i)^2}{12} - Avg^2}$$

where T_i is the i^{th} number.

Temperature.txt
16.5
16.5
18.5
23.0
26.0
27.0
28.5
30.5
29.5
26.0
21.5
18.0

Table 3: Incomplete program of temperature calculation

```
#include <iostream>
#include <fstream>
#include <math.h>
using namespace std;

void main(void)
{
    int ii;
    double avg = 0., std = 0, sum = 0., sum2 = 0., tmpr;
    ifstream fidin;

    fidin.open("Temperature.txt");

    for (ii=0; ii < (14)____; ii++) {
        fidin >> tmpr;
        sum = sum + (15)____;
        sum2 = sum2 + (16)____ * (17)____;
    }
    avg = sum / (18)____;
    std = sqrt( (19)____ / (20)____ - (21)____ * (22)____ );

    cout << "The average is " << avg << " degree Celsius." << endl;
    cout << "The std. dev. is " << std << " degree Celsius." << endl;

    fidin.close();
}
```

再次提醒：單選題答案為 A、B、C，或 D。不得直接回答選項內的數字或文字。

- 14. (A) ii + 12 (B) 12 (C) fidin (D) avg (4分)
- 15. (A) ii (B) fidin (C) sum (D) tmpr (4分)
- 16. (A) sum (B) tmpr (C) avg (D) ii (4分)
- 17. (A) 1.0 (B) 1./12. (C) sum (D) tmpr (4分)
- 18. (A) ii (B) fidin (C) 12 (D) std (4分)
- 19. (A) sum2 (B) tmpr (C) sum (D) sum*sum (4分)
- 20. (A) N (B) avg (C) 12 (D) std (4分)
- 21. (A) cout (B) avg (C) sum (D) sum2 (4分)
- 22. (A) sum2 (B) sum (C) avg (D) cout (4分)

二. 程式撰寫 (共 1 題，共 12 分)

Write a program which asks the user to input an integer N from the keyboard, and then draws an isosceles triangle by outputting N lines of star symbols (*). For example, if the user inputs 5, your program then outputs:

```
  *
 ***
*****
*****
*****
```

You can write your program in C, C++, FORTRAN, MATLAB, Java, Python, BASIC, Tcl, or Pascal.

----- 此線之後無試題 -----

英文單字之參考中譯:

- | | | |
|-----------------------|------------------------|----------------------|
| descendant (n.) 後裔 | compress (v.) 壓縮 | compile (v.) 編譯 |
| maintain (v.) 維護 | manipulate (v.) 操弄 | centralized (a.) 集中的 |
| distributed (a.) 分散的 | recognizable (a.) 可辨認的 | duplication (n.) 重覆性 |
| optical (a.) 光學的 | magnetic (a.) 磁性的 | isosceles (a.) 等腰的 |
| satellite (n.) 衛星 | inheritance (n.) 繼承 | polymorphism (n.) 多型 |
| encapsulation (n.) 封裝 | resolution (n.) 解析度 | |