

本試題是否可以使用計算機:  可使用,  不可使用 (請命題老師勾選)

**Part I 解釋名詞 [10%]:**

Please briefly explain the terms and describe its purpose

1. Wikipedia
2. SATA

**Part II 選擇題 [60%]:**

Please identify the correct answers. There is only one correct answer among the four choices.

1. Suppose physical memory is 256KB and is partitioned into 8 page frames, if logical memory is 5MB, find the number of pages needed in virtual memory.
  - a. 160
  - b. 80
  - c. 320
  - d. 640
2. The program segment listed below is implemented in C language. What is the value of ans after execution?

```
if (((3>2) && (3<3) || (3==6) || (5>4) && 3))
    ans=3;
else ans=4;
```

  - a. 3
  - b. 4
  - c. Segmentation fault
  - d. None of above
3. The \_\_\_\_ acts like a pile of playing cards to which we can only add a card at the top and from which we can only remove the top card.
  - a. linked list
  - b. turning machine
  - c. stack
  - d. Queue
4. Binary search runs \_\_\_\_ steps for n sorted data in worst case.
  - a.  $O(n^2)$
  - b.  $O(n)$
  - c.  $O(\log n)$
  - d.  $O(n \log n)$
5. A(n) \_\_\_\_ database organizes data in rows and columns.
  - a. object-oriented
  - b. relational
  - c. network
  - d. Hierarchical
6. Multimedia entities are most likely to be stored in a(n) \_\_\_\_.
  - a. object-oriented database
  - b. hierarchical database
  - c. data warehouse
  - d. network database
7. Which of the following greatly aids the database administrator in recording and tracking data names, formats, relationships, and cross-references?
  - a. authorization table
  - b. log table
  - c. transaction table
  - d. data dictionary

(背面仍有題目,請繼續作答)

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8. In UML, the graphical diagrams used to represent different multiple perspectives of a system include
- a. Deployment, relationship, and use-case diagrams
  - b. State, interaction, derivative diagrams
  - c. Interaction, relationship, and class diagrams
  - d. use-cases, class, and state diagrams
9. Polymorphism allows for specifics to be dealt with during
- a. compile time
  - b. debugging
  - c. execution time
  - d. programming
10. What is the issue of deadlock related to?
- a. Protection
  - b. Resource allocation
  - c. Job scheduling
  - d. Synchronization
11. The result of  $10011011 \text{ XOR } 10110110$  is
- a. 10010000
  - b. 11010010
  - c. 00101101
  - d. 00111101
12. What is the  $x$  for  $(213)_x = (72)_8$ ?
- a. -5.5
  - b. 5
  - c. -5
  - d. 5.5
13. Which drive interface is essential an extension of the computer's bus?
- a. SATA
  - b. EIDE
  - c. IDE
  - d. SCSI
14. Which Boolean formula is not a tautology?
- a.  $(A \Rightarrow B) \Rightarrow (B \Rightarrow A)$
  - b.  $A \Rightarrow (\sim A \Rightarrow B)$
  - c.  $(A \Rightarrow B) \Rightarrow ((C \Rightarrow A) \Rightarrow (C \Rightarrow B))$
  - d.  $(A \Rightarrow A) \Rightarrow (B \Rightarrow B)$
15. In developing a multimedia application, which of the following terms is not essential?
- a. Stream synchronization
  - b. User interface
  - c. Buffer management
  - d. Code division multiple access

**Part III 程式問答題 [30%]:**

1. [5%] There is a macro in C language defined as below.

```
#define SQ1(x) x*x
```

```
inline int SQ2(int x) {return x*x}
```

What's the value of  $SQ1(1+2*3)*SQ2(1+2*3)$  after macro expansion?

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2. [5%] Write down the output of the following code.

```
void main()
{   int  z,a=5,b=6;
    Z=(a>b)?a:b;
    printf("z=%3d\n",z); }
```

3. [5%] Given the following program segment, what is the value of the variable `svar` after execution of this statement?

```
svar=x(4);
int x(n)
{ if (n<=1) return 1;
  else return (x(n-1)+x(n-2)); }
```

4. [15%] Write a complete function using C/C++ language to evaluate

$$f(x) = a_0 + a_1x + a_2x^2 + a_3x^3 + \dots + a_nx^n.$$

based on the `main()` stated below. You should complete two parts of this code. In the first part, you should ask the user to input the 3 inputs: an integer  $n$ , an array of  $n+1$  real numbers  $A=[a_0, a_1, \dots, a_n]$ , and a real number  $x$ . Note that after your code reads  $n$ , you should allocate memories for the array  $A$ . Then in your second part of the code, you should write a function which passes the 3 inputs (i.e.  $n, A, x$ ) and return  $f(x)$ . In this part you should pass the pointer to the function..

```
void main()
{   int  n;
    double x, *A;
    ==> 1st part of your code
    ==> 2nd part of your code
    printf("f(%f) = %f\n", x, f(x)); }
```