

國立中央大學 資訊工程學系  
九十九學年度 碩士在職專班 招生入學考試試題

科目： 計算機概論 (含資料結構) 第一頁 共七頁

1. What is the IEEE single precision floating point representation of  $(1000.101)_2$ ? (Notice that Sign=1 bit, Exponent=8 bits in Excess\_127, and Mantissa=23 bits)
  - (1) 0 10000010 10001010000000000000000
  - (2) 0 00000011 00010100000000000000000
  - (3) 0 10000010 00010100000000000000000
  - (4) 0 10000011 10001010000000000000000
  - (5) None of the above
  
2. Let's consider an 16-bit integer  $M = (2266)_{16}$ .  
Then  $M \text{ XOR } (FFFF)_{16} \text{ AND } (00FF)_{16} \text{ OR } (FF00)_{16} = ?$ 
  - (1)  $(DD00)_{16}$
  - (2)  $(DDFF)_{16}$
  - (3)  $(FF66)_{16}$
  - (4)  $(2200)_{16}$
  - (5) None of the above
  
3.  $(22.8)_{16} = ?$ 
  - (1)  $(42.4)_8$
  - (2)  $(00100010.01)_2$
  - (3)  $(34.8)_{10}$
  - (4) All of the above
  - (5) None of the above.
  
4. Which of the following **is correct**?
  - (1) The CPU and memory are normally connected by three groups of connections: protocol bus, address bus, and control bus.
  - (2) In the isolated I/O addressing method, the CPU treats each register in the I/O controller as a word (or a location) in memory.
  - (3) The content (內容) of the instruction register (IR) is the data that is going to be read
  - (4) In the RISC architecture, complex instructions are simulated using a subset of simple instructions.
  - (5) In the programmed I/O method, the I/O device informs the CPU when it is ready to transferring (傳送) data.
  
5. Which of the following **is not true** in memory management?
  - (1) Demand segmentation uses swapping.
  - (2) In monoprogramming, most of the memory capacity is dedicated to a single program.
  - (3) The paging approach uses the technique of virtual memory.
  - (4) In demand paging, a program is divided into equally sized pages.
  - (5) Partitioning is a multiprogramming approach.

國立中央大學 資訊工程學系  
九十九學年度 碩士在職專班 招生入學考試試題

科目： 計算機概論 (含資料結構) 第二頁 共 七 頁

6. Consider the C program on the right side. What will be printed on the screen after the program finishes execution?

- (1) -1
- (2) 2
- (3) 0
- (4) 1
- (5) None of the above

```
struct point { int x;};  
  
int main() {  
    struct point *p;  
    struct point q;  
    (*(&q)).x=2;  
    p= &q;  
    q.x= (&q)->x-1;  
    printf("%d", p->x);  
    return 0;  
}
```

7. Let a computer use 2's complement to represent a negative integer. Let X and Y are two 8-bit signed integers in the computer, where

X= 0011 1011  
Y= 0110 1111

Then X-Y=

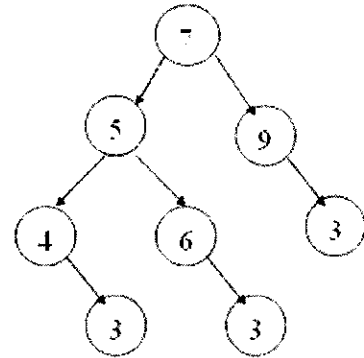
- (1) 1100 1001
  - (2) 1100 1100
  - (3) 1001 0110
  - (4) 1110 1010
  - (5) None of the above
8. Assume a computer uses pipelining of 10 stages. Each stage demands 1 clock cycle to finish its task. How many clock cycles are need to execute 10 independent instructions?
- (1) 10
  - (2) 100
  - (3) 19
  - (4) 21
  - (5) None of the above
9. Which of the following is a white box (glass box) testing in software engineering?
- (1) Random testing
  - (2) Boundary-value testing
  - (3) Basis path testing
  - (4) Exhaustive testing
  - (5) All of the above

國立中央大學 資訊工程學系  
九十九學年度 碩士在職專班 招生入學考試試題

科目： 計算機概論 (含資料結構) 第三頁 共七頁

10. Consider the figure on the right side. Visit all vertices of the binary tree using the **in-order traversal algorithm**. Which of the following is the correct result?

- (1) 7 5 4 3 6 3 9 3
- (2) 4 3 5 6 3 7 9 3
- (3) 3 4 3 6 5 3 9 7
- (4) 3 4 5 3 6 7 3 9
- (5) None of the above



11. Show what is written by the following segments of code, given that item1, item2, and item3 are int variables.

```

=====
StackType<int> stack;
using namespace std;
item1 = 4;
item3 = 0;
item2 = item1 + 1;
stack.Push(item2);
stack.Push(item2 + 1);
stack.Push(item1);
stack.Pop(item2);
item1 = item2 + 1;
stack.Push(item1);
stack.Push(item3);
while (!stack.IsEmpty())
{
    Stack.Pop(item3);
}
cout<<item3;
=====
  
```

What value will be printed on the screen after running the above code?

- (1) 0
- (2) 4
- (3) 5
- (4) 6
- (5) None of the above

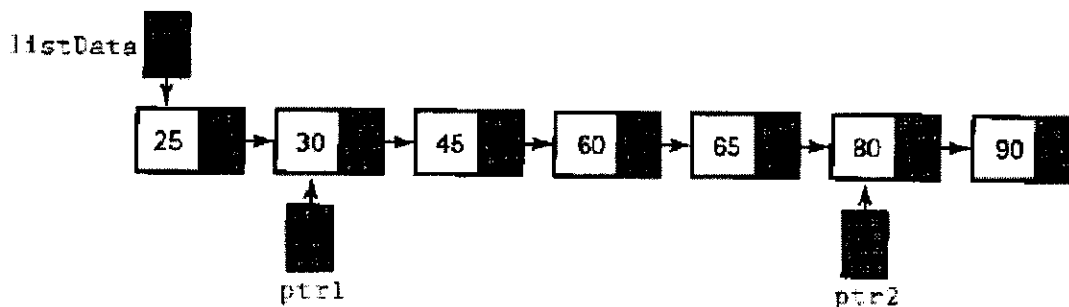
國立中央大學 資訊工程學系  
九十九學年度 碩士在職專班 招生入學考試試題

科目： 計算機概論 (含資料結構) 第四頁 共七頁

12. Which of the following statement is **False**?

- (1) An array is a random-access structure.
- (2) A sequential list is a random-access structure.
- (3) A linked list is a random-access structure.
- (4) A stack is not a random-access structure.
- (5) None of the above

13.



What will be the value of the following expression:

listData -> next -> next -> info

- (1) 25
- (2) 30
- (3) 45
- (4) 60
- (5) None of the above

14. Which of the following statement is **True**?

Recursive functions :

- (1) often have fewer local variables than the equivalent nonrecursive routines.
- (2) generally use *while* or *for* statements as their main control structure.
- (3) are possible only in languages with static storage allocation
- (4) should be used whenever execution speed is critical.

國立中央大學 資訊工程學系  
九十九學年度 碩士在職專班 招生入學考試試題

科目：            計算機概論 (含資料結構)            第五頁 共 七 頁

15. Using the following function answering question below:

```
=====
int Puzzle(int base, int limit)
{
    if (base > limit)
        return -1;
    else
        if (base == limit)
            return 1;
        else
            return base * Puzzle(base+1, limit);
}
=====
```

What would be written by the following call to the recursive function Puzzle?

```
cout<<Puzzle(4, 7);
```

- (1) 100
- (2) 40
- (3) 120
- (4) 250
- (5) None of the above

16. Which of the formulas gives the maximum number of nodes in the  $N$ th level of a binary tree?

- (1)  $N^2 - 1$
- (2)  $2^N$
- (3)  $2^{N+1} - 1$
- (4)  $2^{N+1}$
- (5) None of the above

國立中央大學 資訊工程學系  
九十九學年度 碩士在職專班 招生入學考試試題

科目： 計算機概論 (含資料結構) 第六頁 共七頁

17. Given the array

26	24	3	17	25	24	13	60	47	1
----	----	---	----	----	----	----	----	----	---

Which sorting algorithm would produce the following results after four iterations :

1	3	13	17	26	24	24	25	47	60
---	---	----	----	----	----	----	----	----	----

- (1) Bubble sort
  - (2) Selection sort
  - (3) Insertion sort
  - (4) None of the above
18. A list is sorted from smallest to largest when a sort is called. Which of the following sorts would take the shortest time in time complexity to sort the list?
- (1) Quick Sort
  - (2) Bubble Sort
  - (3) Selection Sort
  - (4) Heap Sort
19. Recording an array of pointers to list elements, rather than sorting the elements themselves, is a good idea when
- (1) The number of elements is very large
  - (2) The individual elements are large in size
  - (3) The sort is recursive
  - (4) There are multiple keys on which to sort the elements.

國立中央大學 資訊工程學系  
九十九學年度 碩士在職專班 招生入學考試試題

科目：            計算機概論 (含資料結構)            第七頁 共 七 頁

20. Segments of code are listed as below:

```
=====
i = 1;
Ans = 1;
while ( i < 6 )
{
    i++
    Ans--
    do
    {
        i++;
        Ans++
    } while ( i<4)
}
=====
```

What will be the value of Ans after executing the code?

- (1) 0
- (2) 1
- (3) 2
- (4) 3