

國立中央大學 資訊工程學系

101 學年度 碩士在職專班 招生入學考試命題紙

科目： 計算機概論 (含資料結構) 第一頁 共四頁

一、單選題 (76%)

1. Which of the following is equivalent to 12 in decimal? (a) $(1110)_2$ (b) $(C)_{16}$ (c) $(15)_8$ (d)None of the above
2. How many symbols can be represented by a bit pattern with ten bits? (a)128 (b)256 (c)512 (d)1024
3. Suppose we will like to redesign the ASCII code. If the new ASCII code for E is 1000101, then the ASCII code for e is? (a)1000110 (b)1000111 (c)0000110 (d)1100101
4. Which number representation methods is often used to store the exponential value of a fractional part? (a) unsigned integers (b)two's complement (c) Excess system (d)None of the above
5. If the exponent in Excess_127 is binary 10000101, the exponent in decimal is? (a)6 (b)7 (c)8 (d)9
6. Which one is a stand-alone storage location that holds data temporarily. (a)An ALU (b)A register (c)A control unit (d) A tape drive
7. A control unit with five wires can define up to ____ operations. (a)5 (b)10 (c)16 (d)32
8. The smallest storage area on a magnetic disk that can be accessed at one time is a _____? (a)track (b)sector (c)frame (d)head
9. How many inner nodes would a quadtree with n leave nodes have? (a)n-1 (b)n/4 (c) $(n-1)/3$ (d) $(n-1)/4$
10. How many comparisons are needed of a binary search in a 2000-student array to find a student's information? (a)21 (b)17 (c)15 (d)11
11. If we use bubble sort to sort the following six number (30, 6, 79, 1, 27, 33) with the order from small to big. How many interchange operations would be performed? (a)3 (b)7 (c)10 (d)15
12. Three nodes can compose ____ kinds of binary tree? (a)5 (b)6 (c)7 (d)8
13. Given a postfix statement "52*4+63*-78*+", what is its value? (a)52 (b)2 (c)193 (d)-14

14. How many nodes are included in a complete binary tree with k leaf nodes? (a) k^2
(b) 2^k (c) $\log_2 k$ (d) $2k-1$
15. Consider the C program on the right side. What will be printed on the screen after the program finishes execution?
(a) -1
(b) 2
(c) 0
(d) 1
(e) 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;
}
```

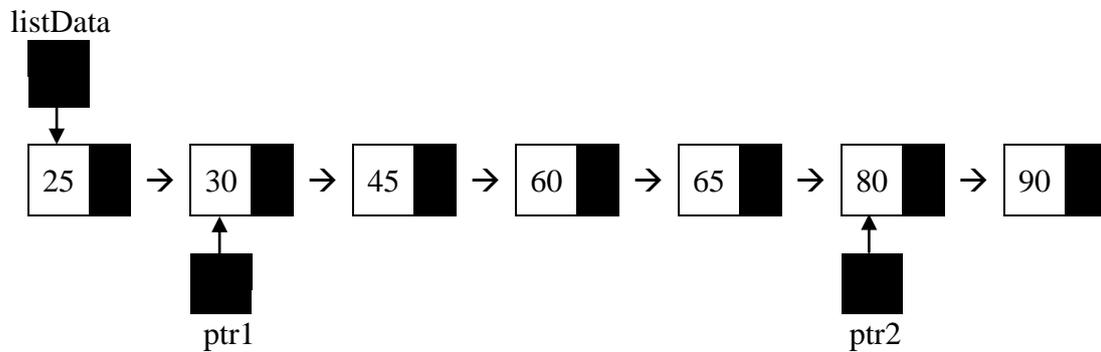
16. Show what is written by the following segments of code, given that item1, item2, and item3 are int variables.

```
=====
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?

- A. 0
B. 4
C. 5
D. 6
E. None of the above

17.



What will be the value of the following expression:

listData -> next -> next -> info

- A. 25
- B. 30
- C. 45
- D. 60
- E. None of the above

18.

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);

- A. 100
- B. 40
- C. 120
- D. 250
- E. None of the above

19.

Segments of code are listed as below:

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

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

- A. 0
- B. 1
- C. 2
- D. 3

二、多選題 (24%) (no partial credit)

- 20. The data in _____ would not be erased if the computer is powered down. (a)RAM (b)ROM (c)a tape drive (d)a CD-ROM
- 21. Which are the main steps in the running of a program on a computer? (a)compiler (b)execute (c)fetch (d)decode
- 22. When a fractional part is normalized, the computer stores the_____?(a)sign (b)exponent (c)mantissa (d)None of the above
- 23. Which are not the units of data transferring? (a)BPI (b)CPI (c)BPS (d)CPS
- 24. CPU is composed of which of the following element(s)? (a)ALU (b)I/O (c)CU (d)RAM
- 25. Which of the following are/is the standard(s) of LAN? (a)Ethernet (b)Token ring(c)ARCnet (d)Seednet