

元智大學 101 學年度研究所 碩士班 招生試題卷

系(所)別: 生物與醫學資訊
碩士學位學程

組別: 不分組

科目: 計算機概論

用紙第 1 頁共 2 頁

●不可使用電子計算機

一、單選題(每題有 5 個選項, 其中正確選項只有一個。每題 3 分, 共 30 分)

請在答案卷中繪出下列表格, 並將正確答案選項填入各題對應答案欄中。

題號	1	2	3	4	5	6	7	8	9	10
答案										

- Suppose a system represents numbers in 8-bit two's complement notation. What is the equivalent base-ten number for the pattern 11001101?

(a) -49 (b) -50 (c) -51 (d) -52 (e) None of above
- Which of the following programming languages is not an objected-oriented language?

(a) C (b) C++ (c) Java (d) Smalltalk (e) Python
- Let $\oplus$ denote the exclusive-or (XOR) operation, which of the following sequences of operations exchanges the content of X and Y ?

$X \leftarrow X \oplus Y$ $X \leftarrow X \oplus Y$ $X \leftarrow X \oplus Y$ $X \leftarrow X \oplus Y$
 (a) $Y \leftarrow X \oplus Y$ (b) $X \leftarrow X \oplus Y$ (c) $Y \leftarrow X \oplus Y$ (d) $X \leftarrow X \oplus Y \oplus 0$ (e) None of above
 $X \leftarrow X \oplus Y$ $Y \leftarrow X \oplus Y$ $Y \leftarrow X \oplus Y$ $Y \leftarrow X \oplus Y \oplus 1$
- Which of the following expressions is NOT true?

(a) $\overline{X+Y} = \overline{X} + \overline{Y}$ (b) $\overline{XY} + X\overline{Y} = \overline{(X\overline{Y} + \overline{XY})}$ (c) $XYZ + XZ + YZ = X + Y + Z$
 (d) $X(Y + \overline{Z}) = XYZ + XY\overline{Z}$ (e) None of above
- Which of the following descriptions to binary tree is incorrect?

(a) There is an empty binary tree.
 (b) The maximum number of nodes on level i of a binary tree is $2^{i-1}, i \geq 1$.
 (c) The maximum number of nodes in a binary tree of depth k is $2^k - 1, k \geq 1$.
 (d) A complete binary tree of depth k is a binary tree of depth k having $2^k - 1$ nodes.
 (e) None of above
- Which of the following statements is incorrect?

(a) $n! = O(n^n)$ (b) $6n^3 / (\log n + 1) = O(n^3)$ (c) $n^3 2^n + 6n^2 3^n = O(n^2 2^n)$
 (d) $n^3 + 10^4 n^2 + 10^2 n + 100 = O(n^3)$ (e) None of above
- Which of the following is NOT an NP-complete problem?

(a) Clique Problem (b) Closet Problem (c) Knapsack Problem
 (d) Traveling Salesman Problem (e) Hamiltonian path problem
- What is the standard protocol for sending e-mail?

(a) TCP/IP (b) HTTP (c) SMTP (d) UML (e) Outlook
- The OSI model shows how the network functions of a computer ought to be organized. In the OSI model, what is the main function of the transport layer?

(a) node to node delivery (b) process to process message delivery (c) synchronization
 (d) updating and maintenance of routing tables (e) authentication and encryption
- Vector graphics is the use of geometrical primitives such as points, lines, curves, and shapes or polygon(s), which are all based on mathematical expressions, to represent images in computer graphics. Which of the following image file formats can represent image in vector graphics?

(a) GIF (b) JPG (c) SVG (d) TIFF (e) TGA

二、名詞解釋(每題 5 分, 共 40 分)

- | | | |
|------------------------------------|-----------------------|-------------------|
| (a) Von Neumann model/architecture | (b) RISC | (c) Page fault |
| (d) Stable sorting algorithm | (e) Digital signature | (f) Private Cloud |
| (g) DBMS | (h) Solid State Disk | |

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三、請寫出下列 C++ 程式片段的輸出結果，注意答案格式必須與電腦執行結果輸出一致。(每題 6 分，共 30 分)

(a)

```
int i, j, sum = 0;
for( i = 0; i < 3; ++i )
    for( j = 0; j <= 4; ++j )
        sum += i;
        sum += j;
cout << "i=" << i << endl << "j=" << j << endl
    << "sum=" << sum << endl;
```

(b)

```
void BiasSwap(int &x, int y)
{
    int tmp = x;    x = y;    y = tmp;
}
int main()
{
    int a = 5, b = 10;
    BiasSwap(a, b);
    cout << "a=" << a << endl << "b=" << b << endl;
    return 0;
}
```

(c)

```
int cnt=0;
int rfun(int n)
{
    ++cnt;
    if(n>2)    return rfun(n-1)+2*rfun(n-2);
    else    return n;
}
int main()
{
    cout << "There are " << cnt
        << " function calls" << endl
        << "rfun(6)=" << rfun(7) << endl;
    return 0;
}
```

(d)

```
class Valued {
public:
    Valued( int num = 1 ) : value(num)
    {    int v = 100;
        cout << "Constructor: " << value << endl; }
    ~Valued() { cout << "Destructor Value="
        << value << endl; }

private:
    int value;
};
int main() {
    {    Valued a(10), b(20);
        {    Valued c;    }
    }
    return 0;
}
```

(e)

```
class A {    public:
    virtual void print(){ cout << "A print" << endl; }};
class B: public A {    public:
    virtual void print(){ cout << "B print" << endl; }};
class C: public B {    public:
    virtual void print(){ cout << "C print" << endl; }};
class D: public A {    public:
    void print(){ cout << "D print" << endl; }
};
int main() {
    A objA, &rA = objA, *ptr;
    B objB, &rB = objB;
    C objC, &rC = objC;
    D objD, &rD = objD;
    ptr = &objA;    ptr->print();
    ptr = &objB;    ptr->print();
    ptr = &objC;    ptr->print();
    ptr = &objD;    ptr->print();
    rA.print(); rB.print();    rC.print(); rD.print();
    return 0;
}
```