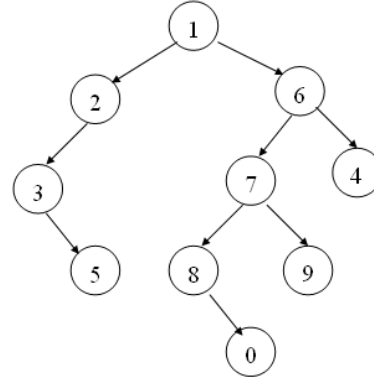


國立中央大學 資訊工程學系
100 學年度 碩士在職專班 招生入學考試試題

科目： 計算機概論 (含資料結構) 第一頁 共五頁

1. Which of the following choices represents a correct in-order traversal for the binary tree on the right side?

- A. 5 3 2 0 8 9 7 4 6 1
- B. 5 3 2 1 0 8 7 9 6 4
- C. 4 6 9 7 0 8 1 2 5 3
- D. 3 5 2 1 8 0 7 9 6 4
- E. None of the above



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

- A. 3, 2
- B. 2, 3
- C. 1, 0
- D. 0, 1
- E. None of the above

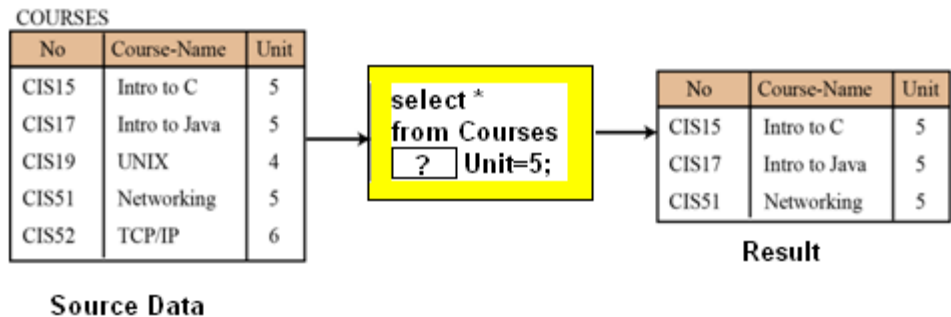
```

struct point { int x; int y;};

int main() {
    struct point p, q;
    struct point *r;
    r = &q;
    q.x = p.y;   q.y = p.x;
    r->y = 1;   r->x = 0;
    p.y = 2;   q.x = 3;
    printf("%d, %d", q.x, q.y);
    return 0;
}
  
```

3. A SQL keyword is missing on the right figure. What is it?

- A. set
- B. values
- C. where
- D. update
- E. get



4. Which of the following **is not** a binary search tree:

<p>A.</p> <div style="text-align: center;"> </div>	<p>B.</p> <div style="text-align: center;"> </div>	<p>C.</p> <div style="text-align: center;"> </div>	<p>D.</p> <div style="text-align: center;"> </div>	<p>E.</p>
--	--	--	--	-----------

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科目： 計算機概論 (含資料結構) 第二頁 共五頁

5. A computer has **128 Giga Bytes** of memory. **Each word** in this computer is **4 bytes**. The computer needs at least ____ bits to address (定址) **any single word** in memory. (Hint: KB, MB, GB, TB, PB, ...)
- A. 31 B. 32 C. 33 D. 34 E. None of the above

6. Which of the following **is true** regarding the TCP/IP protocol suite?
- A. The application layer is responsible for providing services to the users.
 B. The transport layer is responsible for the logical delivery of a message between client and server processes.
 C. The network layer is responsible for the delivery of individual packets from the source host to the destination host.
 D. The data link layer is responsible for node-to-node- delivery of frames.
 E. All of the above

7. Assume you are given 3 basic instructions for positive integers:

<i>Instruction</i>	<i>Explanation</i>
Incr(X)	It adds 1 to X
Decr(X)	It subtracts 1 from X
While (X) {...}	It repeats the code inside {} If X = 0 then terminates the loop Else continue the loop

Which of following is a better solution to represent $A \leftarrow B$?

<p>A.</p> <pre>While (B) { Decr(B) Incr(A) }</pre>	<p>B.</p> <pre>While (A) {Decr(A)} While (B) { Decr(B) Incr(A) }</pre>	
<p>C.</p> <pre>While (C) {Decr(C)} While (A) {Decr(A)} While (B) { Incr(C) Decr(B) Incr(A) } While(C) { Incr(B) Decr(C) }</pre>	<p>D.</p> <pre>While (A) { Decr(A) Incr(C) } While(C) { Incr(B) Decr(C) } While (B) { Incr(C) Decr(B) Incr(A) }</pre>	<p>E.</p> <pre>While (A) {Decr(A)} While (B) { While(A) { Decr(A) Incr(B) } Incr(A) Decr(B) }</pre>

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科目： 計算機概論 (含資料結構) 第三頁 共五頁

8. Consider the C++ program on the right side. Which of the following can be called in main()?

- A. c.f1() B. b.f2()
C. b.f1() D. a.f3()
E. None of the above

<pre>class A { public: void f1() { } protected: void f2(){ } private: void f3(){ } };</pre>	<pre>class B: public A{ }; class C: protected B { }; int main () { B b; C c; ... }</pre>
---	--

9. Consider the C++ program on the right side. It uses polymorphism. How many “X” and “Y” are printed?

- A. X:1 Y:3 B. X:2 Y:2
C. X:3 Y:1 D. X:0 Y:4
E. None of the above

```
#include <iostream>
using std::cout;
using std::ostream;

class A {
public:
    virtual void f()
    {cout<<"X\n";}
};

class B: A{
public:
    void f(){cout<<"Y\n";}
};
```

```
int main () {
    A a; B b;
    A* aptr = &a;
    A* bptr = &b;
    aptr->f();
    bptr->f();
    (*bptr).f();
    b.f();
    return 0;
}
```

10. Which of the following **is true** regarding computer security?

- A. Authentication keeps information secret from unauthorized access.
B. Steganography conceals the secret message by covering it with something else, such as an image file and a video file.
C. In public-key cryptography, two parties communicate each other by using a shared key to encrypt and decrypt their secret messages
D. Denial-of-service (DoS) attacks confidentiality of the secret communication channel between two parties.
E. All of the above

11. Given that k is an integer array starting at location 2000, kPtr is a pointer to k and each integer is stored in 4 bytes of memory, what location does kPtr + 3 point to?

- A. 2003. B. 2006. C. 2012. D. 2024.

12. Which of the following is not a dynamic data structure?

- A. Linked list. B. Stack. C. Array. D. Binary tree.

13. What value does function `mystery` return when called with a value of 4?

```
int mystery ( int number )
{
    if ( number <= 1 )
        return 1;
    else
        return number * mystery( number - 1 );
}
```

- A. 0. B. 1. C. 4. D. 24.

14. Given the class definition:

```
class CreateDestroy
{
public:
    CreateDestroy() { cout << "constructor called, "; }
    ~CreateDestroy() { cout << "destructor called, "; }
};
```

What will the following program output?

```
int main()
{
    CreateDestroy c1;
    CreateDestroy c2;
    return 0;
}
```

- A. constructor called, destructor called, constructor called, destructor called, .
B. constructor called, destructor called, .
C. constructor called, constructor called, .
D. constructor called, constructor called, destructor called, destructor called, .

15. For a non-empty linked list, select the code that should appear in a function that adds a node to the end of the list. `newPtr` is a pointer to the new node to be added and `lastPtr` is a pointer to the current last node. Each node contains a pointer `nextPtr`.
- A. `lastPtr->nextPtr = newPtr;`
`lastPtr = newPtr.`
 - B. `lastPtr = newPtr;`
`lastPtr->nextPtr = newPtr.`
 - C. `newPtr->nextPtr = lastPtr;`
`lastPtr = newPtr.`
 - D. `lastPtr = newPtr;`
`newPtr->nextPtr = lastPtr`
16. A queue performs the following commands (in pseudo-code):
- enqueue 4, 6, 8, 3, 1*
 - dequeue three elements*
 - enqueue 3, 1, 5, 6*
 - dequeue two elements*
- What number is now at the front of the queue?
- A. 3. B. 4. C. 5. D. 6.
17. The number 188.875 in decimal is equal to number ____ in octal.
- A. 273.7 B. 274.7 C. 258.5 D. 278.6.
18. In which of the following addition problems (using two's complement notation) does an overflow error occur?
- A.0011+1010 B.0100+0100 C.1100+1100 D.0101+1000
19. In a _____ data compression method, the received data need not be an exact copy of the original message.
- A. MP3 B. JPEG C. MPEG D. all of the above
20. Select the false statement regarding inheritance.
- A. A derived class can contain more attributes and behaviors than its base class.
 - B. A derived class can be the base class for other derived classes.
 - C. Some derived classes can have multiple base classes.
 - D. Base classes are usually more specific than derived classes.