

# 大同大學 97 學年度研究所碩士班入學考試試題

考試科目: 計算機概論

所別: 資訊工程研究所

第 1/3 頁

註: 本次考試 不可以參考自己的書籍及筆記; 不可以使用字典; 不可以使用計算器。

選擇(1~25題)、是非(26~50題), 每題各佔1%, 請在答案紙上註明題號。

1. ( ) Which of the following data structure is used to implement the call-return sequence? (a) queue (b) B-tree (c) stack (d) binary tree (e) graph
2. ( ) The most common "fundamental unit" of digital electronics is \_\_\_\_\_. (a) boolean algebra (b)SSI (c)logic gate.(d) microchip.
3. ( ) HTML is commonly used as (a) programming language (b) communication protocol (c) data structure (d) markup language.
4. ( ) Which is true for the C assignment statement? "i=i+1;" (a) the left i is value (b) the right i is value (c) both i's are value (d) both i's are location.
5. ( ) XML is a(n) \_\_\_\_ (a) programming language (b) structured syntax (c) platform (d) on-line game.
6. ( ) Which of the following is not the feature of object-oriented language? (a) Inheritance (b) Abstract data type (c) Polymorphism (d) Activation record.
7. ( ) \_\_\_\_ is software and information that enables your operating system to establish the communications between your existing hardware and your new device. (a) DBMS (b) memory management module (c) device driver (d) file system.
8. ( ) The technical term for a Web page address is a(n) (a) domain name. (b) top-level domain. (c) URL. (d) URN.
9. ( ) A parallel connector and port are (a) plug and play and hot swap capable (b) used for mice and trackballs (c) used mostly for printers (d) both a and b.
10. ( ) A(n) \_\_\_\_ is a field in a database table that uniquely identifies a record in that table. (a) foreign key (b) unique key (c) secondary key (d) primary key.
11. ( ) \_\_\_\_ is a small text file containing specific information about you that a Web site stores on your computer's hard drive. (a) sniffer (b) spam (c) cookie (d) my favorite.
12. ( ) \_\_\_\_ are mistakes that occur when you run the software code. (a) run-time errors (b) logic errors (c) syntax errors (d) bugs
13. ( ) A graphical depiction of an algorithm is called \_\_\_\_\_. (a) pseudocode. (b) logical structure. (c) a program flowchart. (d) a GUI layout.
14. ( ) Which is not a motivation for "functionalizing" a program? (a) The divide-and-conquer approach makes program development more manageable. (b) Software reusability—using existing building blocks to create new programs. (c) Avoid repeating code. (d) Execution performance—functionalized programs run faster.
15. ( ) Using the following function definition A B(C) {D}, the parameter list is represented by (a) A (b) B (c) C (d) D
16. ( ) Three of the following expressions have the same value. Which of the following's value is different from the others? (a) \*&Ptr (b) \*&Ptr (c) \*Ptr (d) Ptr
17. ( ) When a compiler encounters a function parameter for a single-subscripted array of the form int a[], it converts the parameter to (a) int a (b) int &a (c) int \* a (d) int \* const a
18. ( ) If a = 7.0, b = 7.0, and c = 6.0, then what is printed by "printf( "%0.2f", sqrt( a + b \* c ) );" (a) 49 (b) 7.00 (c) 7 (d) 49.00
19. ( ) Storage holds \_\_\_\_\_ for future use. (a) data (b) instructions (c) information (d) all of the above.
20. ( ) In order, from less expensive to more expensive and from slower to faster, storage media are: (a) floppy disk, compact disc, hard disk, tape (b) hard disk, tape, floppy disk, compact disc (c) compact disc, hard disk, tape, floppy disk (d) tape, floppy disk, compact disc, hard disk.
21. ( ) A bus is: (a) part of the computer that decides if a value should be stored as an integer or floating point. (b) a group of parallel wires that carry control signals and data between the computer's components (c) a logical operation that can be performed by a computer (d) a series of tests that is performed on all of the computer's components during machine startup.
22. ( ) The von Neumann bottleneck refers to: (a) the difficulty of writing code in an imperative language (b) the essentially sequential nature of the von Neumann architecture (c) von Neumann's love of writing machine language (d) the fact that Jon von Neumann was so busy that getting in to see him was nearly impossible.
23. ( ) Programmed I/O requires the CPU to the I/O hardware to see if it is ready. (a) poll (b) handshake (c) block (d) suspend.
24. ( ) If the number 1010 is in 4 bit 2's complement, what is the 1's complement equivalent of the number? (a) 1011 (b) 1001 (c) 0101 (d) 0110.
25. ( ) What is the Hexadecimal equivalent of the decimal number 21.5? (a) 1F.5 (b) 15.5 (c) 15.8 (d) 15.1.
26. ( ) A linked list contains a number of sequentially connected nodes, each of which must contain data of the same type. True or false.
27. ( ) CPU cache is the memory that the CPU uses when there's not enough RAM. True or false.
28. ( ) Fragmentation occurs when computer places parts of files over many disk areas or clusters. True or false.
29. ( ) Registers are part of memory or a storage device, not part of the processor.
30. ( ) In nonvolatile memory, the stored information is lost when the computer is turned off.
31. ( ) Main memory is often referred to as RAM.
32. ( ) A modern digital camera seldom contains ash memory. It, however, uses cache memory to increase the performance in recording the images.

33. ( ) 2's complement representation is commonly used because it simplifies multiplication and division.
34. ( ) The IP address of a computer can change when it moves to a different geographic location.
35. ( ) In a packet-switched network, the packets that make up a message must all take the same path through the network.
36. ( ) The Internet is a packet-switched network.
37. ( ) A critical section is any code sequence that must be atomic for the system to work properly.
38. ( ) Apache is a powerful web browser that is free to the public.
39. ( ) Solaris is a commercial UNIX OS that was developed by Sun Microsystems.
40. ( ) A common format for audio files on the Web is MPEG.
41. ( ) To speed up the display of Web pages, most Web browsers allow users to turn off the text and display only graphics.
42. ( ) A Web server can host more than one Web sites.
43. ( ) HTML tags can only be typed as UPPER CASE characters only.
44. ( ) HTML tags can be nested with other tags.
45. ( ) The first page of a web site is named index.htm.
46. ( ) In Java array indices start at 1.
47. ( ) In C array indices start at 0.
48. ( ) If we have a declaration `int **p`, then `*p` is a pointer to an int.
49. ( ) The sorting algorithm Bubble-Sort for  $N$  items has a worst-case running time of  $O(N \log N)$ .
50. ( ) One of the advantages of interpreted languages is their faster execution time compared to compiled languages.

問答(51~56題)，請在答案紙上註明題號。

51.(10%) For each of the following, write a single statement that performs the indicated task. Assume that long integer variables `value1` and `value2` have been defined and that `value1` has been initialized to 200000.

- a) Define the variable `IPtr` to be a pointer to an object of type `long`.
- b) Assign the address of variable `value1` to pointer variable `IPtr`.
- c) Print the value of the object pointed to by `IPtr`.
- d) Assign the value of the object pointed to by `IPtr` to variable `value2`.
- e) Print the value of `value2`.

ANS:

52.(10%) Find the error in each of the following (Note: there may be more than one error):

- a) 

```
for ( x = 100, x >= 1, x++)
    printf( "%d\n", x );
```
- b) The following code should print whether a given integer is odd or even:
 

```
switch ( value % 2 ) {
case 0:
    printf( "Even integer\n" );
case 1:
    printf( "Odd integer\n" );
}
```
- c) 

```
for ( x = .000001; x <= .0001; x += .000001 )
    printf( "%.7f\n", x );
```
- d) The following code should output the even integers from 2 to 100:
 

```
counter = 2;
Do {
    if ( counter % 2 == 0 )
        printf( "%d\n", counter );
    counter += 2;
} While ( counter < 100 );
```
- e) The following code should sum the integers from 100 to 150 (assume `total` is initialized to 0):
 

```
for ( x = 100; x <= 150; x++ )
    total += x;
```

ANS:

53. (10%) Given the following variable declarations, what is the result type and value for each expression? Use N/A if the type or value cannot be determined from the information available.

```
char* s = "mystring";
int i_array [5] = {1, 2, 3};
int *ip_array [5]; ip_array [0] = i_array;
```

Expression	type	value
a) i_array[0]	_____	_____
b) i_array [4]	_____	_____
c) i_array	_____	_____
d) ip_array[0]	_____	_____
e) *s	_____	_____

54. (10%) Write the recursive algorithm for GCD(A,B)  
ANS :

55. (10%) Fill in the blanks(2% each) in the following:

- a) The maximum number of nodes on level  $i$  of a binary tree is \_\_\_\_\_,  $i \geq 1$
- b) The maximum number of nodes in a binary tree of depth  $k$  is \_\_\_\_\_,  $k \geq 1$ .
- c) The height of a complete binary tree with  $n$  nodes is \_\_\_\_\_
- d) If a complete binary tree with  $n$  nodes is numbered sequentially, then for any node with index  $i$ ,  $1 \leq i \leq n$ , we have  $parent(i)$  is at location \_\_\_\_\_ if  $i \neq 1$ .  
If  $i = 1$ ,  $i$  is at the root and has no parent;  $LeftChild(i)$  is at location \_\_\_\_\_.(If it  $> n$ , then  $i$  has no left child.)