1.答案以橫式由左至右書寫。2.請依題號順序作答。

## 一、選擇題 (60%):每題 3%

__1. The ____ model is the basis for today's computers.

    (a) Leibnitz   (b) von Neumann   (c) Pascal   (d) Charles Babbage

__2. A Wi-Fi network uses ____ to provide Internet connections to wireless computers and devices

  (a)copper telephone lines   (b)a cable television network   (c) radio signals (d) a dish-shaped antenna

__3. Many Web page addresses begin with ____ , which stands for a set of rules that defines how pages transfer on the Internet.

    (a) http   (b) W3C   (c) hits   (d) pop

__4. A(n) ____ restricts access to specified Web sites.

    (a) anti-spam program   (b) antivirus program   (c) Web filter   (d) spyware remover

__5. The ____ is the component of the processor that directs and coordinates most of the operations in the computer.

    (a) control unit   (b) arithmetic logic unit   (c) register   (d) machine cycle

__6. Processors that can execute more than one instruction per clock cycle are said to be ____.

    (a) flash drives   (b) dual-core processors   (c) system on a chip   (d) superscalar

__7. RFID is a technology that uses ____to communicate with a tag placed in or attached to an object, an animal, or a person.

    (a) a thin wire   (b) pixels   (c)radio signals (d) light waves

__8. Printer resolution is measured by the number of ____ a printer can print.

    (a) pages per minute(ppm)   (b) pixels per inch(ppi)   (c) lines per minute(lpm)   (d) dots per inch(dpi)

__9. Which of the following best describes the NAND operation?

    (a) an XOR followed by a NOT   (b) an OR followed by a NOT

    (c) a NOT followed by a NOT   (d) an AND followed by a NOT

10. Which of the following data storage systems provides the most efficient random access to individual data items?

(a) floppy disk   (b) main memory   (c) optical CDs and DVDs   (d) hard disk

11. Which of the following mass storage system does not require physical motion?

(a) magnetic tape   (b) magnetic disk   (c) DVDs   (d) flash drives

12. How many different symbols can be encoded using Unicode?

(a) 256   (b) 4,096   (c) 65,536   (d) 1,046,476

13. Which of the following is an Internet application that is named after its underlying protocol?

(a) Email   (b) World Wide Web   (c) FTP   (d) UDP

14. Which of the following is not a protocol used in the basic TCP/IP software hierarchy?

(a) POP3   (b) UDP   (c) TCP   (d) IP

15. Under the assumption that X takes on only integer values, which of the following is the termination condition for the following loop?

while (X < 15) { . . . }

(a) $X > 14$ (b) $X > 10$ (c) $X < 10$ (d) $X < 0$

16. Which of the following is the base case in the recursive procedure below?

procedure xxx (N)

if (N is equal to 0) then (print the value of N)

         else (apply the procedure xxx to the value N - 1)

(a) $N > 0$ (b) $N = 0$ (c) $N < 0$

17. The class of problems known as NP is so named because it is composed of which of the following?

(a) non-polynomial problems   (b) non-programmable problems

(c) non-universal problems   (d) non-deterministic polynomial problems

18. The amount of storage for a hard disk of 50GB is

(a) 5×10^5 bytes   (b) 5×10^8 bytes   (c) 5×10^9 bytes   (d) 5×10^{10} bytes.

19. Which one is the shortest in time ?

(a) millisecond   (b) picoseconds   (c) nanosecond   (d) microsecond

20. Which of the following values is the binary notation of 5/8?

(a) 0.011   (b) 0.101   (c) 0.110   (d) 0.111

二、簡答題(40%):每題 8%

1. **What sequence of nodes from the tree**
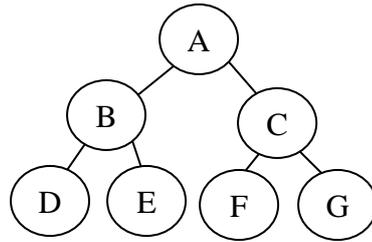
    would be printed if the following recursive procedure were applied to it?

    ```
    procedure printTree (Tree)
    if (Tree is not empty)
    then (print the root of Tree;
          apply the procedure printTree to the left subtree of Tree)
    ```

2. When searching for the entry X within the list

    P, Q, R, S, T, U, V, W, Z

    how many entries will be considered before discovering that the entry is not present? (Note that the list is in alphabetical order.)?

3. List the following complexity classes in increasing order of complexity.

    $\Theta(n^2)$ $\Theta(2^n)$ $\Theta(\log n)$ $\Theta(n \log n)$

You may use any programming languages for the following problems.

4. Write a program that reads in an integer number n and outputs a_n of the sequence $a_0, a_1, a_2,...,$ where $a_n = a_{n-1} \times a_{n-2}$ with a_0=1, and a_1=2.

5. Write a program that reads in a positive integer and finds all the factors of the positive integer. For example, in the case of the integer 12, your program should output the integer numbers 1, 2, 3, 4, 6, and 12.