

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

Part A.

1. Multiple choice questions. Choose the alternative that best completes the statement or answers the question (20%)

(1) What does ASCII stand for?

- a) American Standard Code for Information Interchange
- b) American Scientific Code for Information Interchange
- c) American Scientific Code for Interchanging Information
- d) American Standard Code for Interchanging Information
- e) None of above

(2) Components used for interconnecting dissimilar networks that use different communication protocols.

- a) Switches
- b) Gateways
- c) Routers
- d) Bridges
- e) None of above

(3) What is the term for a narrow recording band that forms a full circle on the surface of a hard disk?

- a) sector
- b) track
- c) cluster
- d) platter
- e) None of above

(4) Which of the following statements is not true about operating systems designed to work with a server on a network?

- a) A multiuser operating system organizes and coordinates how multiple users access and share resources on a network.
- b) Some operating systems have network features built into them.
- c) The network administrator uses the operating system on the network to configure the network.
- d) Client computers cannot function unless they are connected to the network because they cannot access an operating system.

(5) Components that operate at bottom two layers of the OSI model.

- a) Bridges
- b) Switches
- c) Hubs
- d) Routers

(6) Any system that uses the HTTP protocol is called _____

- a) Web Browser
- b) Web Server
- c) WWW

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- d) TCP/IP
- e) None of above

(7) In the Internet Protocol (IP) suite of protocols, which of the following best describes the purpose of the Address Resolution Protocol?

- a) To translate Web addresses to host names
- b) To determine the IP address of a given host name
- c) To determine the hardware address of a given host name
- d) To determine the hardware address of a given IP address
- e) To determine the appropriate route for a datagram

(8) A malicious code hidden inside a seemingly harmless piece of code.

- a) Worm
- b) Bomb
- c) Trojan Horse
- d) Virus
- e) None of above

(9) Which of the following C++ expressions does NOT always correctly compute the mathematical average of the integer variables a, b, c, and d?

- a) $\text{float}((a + b + c + d) / 4.0)$
- b) $(\text{float}(a + b + c + d)) / 4$
- c) $(a + b + c + d) / 4$
- d) $(a + b + c + d) / 4.0$
- e) $(a + \text{float}(b) + c + d) / 4$

(10) In object-oriented programming languages, overloaded functions must have:

- a) Different parameter lists.
- b) Different return types.
- c) The same number of parameters.
- d) The same number of default arguments.
- e) None of above

2. Short answer questions and discussion

(1) Perform the following conversions.(9%)

- (a) convert $(346.25)_{10}$ to hexadecimal number
- (b) convert $(1AD.86)_{16}$ to octal number
- (c) What is two's complement binary integer of -2020 using 16 bits?

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(2) Consider the following recursive function.(3%)

```
int Fun(int n)
{
    if (n == 4)
        return 2;
    else
        return 2*Fun(n+1);
}
```

What is the value returned by the function call Fun (2) ?

(3) What is the output by the following C++ program segment?(3%)

```
char c = 'A';
do {
    cout << c << " ";
    c += 2;
} while ( c <= 'M' )
cout << endl;
```

(4) What is cookie for Web applications? Why is the so-called 'cookie'? Why cookies are not considered as spyware?(5%)

(5) Is Python an interpreted, compiled, or both language? Is Java an interpreted, compiled, or both language? What is the difference between a compiled and an interpreted program language?(5%)

(6) Gartner, a world-wide information technology research and advisory firm, just released its list of the top 10 strategic technologies for 2020 at the Gartner Symposium/ITxpo in Orlando, Florida, USA. These technologies expected to have the most strategic impact in the next three years include Trend No. 9: Practical blockchain. It has been pointed that blockchain is already appearing in experimental and small-scope projects. However, it remains immature for enterprise deployments. Do you agree or disagree? Why? Provide some evidences to support your argument.(5%)

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Part B

3. Identify the letter of the choice that best matches the phrase or definition. (2% each)

- (1) Do this to add your e-mail name and address to a mailing list.
- (2) Windows 7 and Linux are examples.
- (3) Kind of software that consists of programs designed to make users more productive.
- (4) A collection of unprocessed items, which can include text, numbers, images, audio, and video.
- (5) A device consists of electronic components that store instructions waiting to be executed and data needed by those instructions.
- (6) A program controls how you enter data and instructions and how information is displayed on the screen.
- (7) The process of setting up the software.
- (8) A software for organizing data in rows and columns and performing calculations on the data.
- (9) The component of the processor that directs and coordinates most of the operations in the computer.
- (10) Frees processors from having to wait for one instruction to complete the machine cycle before fetching the next.
- (11) If application software has stopped responding and the hard disk's LED blinks repeatedly, the operating system probably is doing this.
- (12) Your Internet service provider supplies this, for an e-mail address.
- (13) Keeps track of changes made to Web sites by checking RSS feeds.
- (14) Self-service gas pumps often print receipts using this kind of printer.
- (15) Can be negatively affected by the distance between two points, the type of transmission media, and the number of nodes through which data must travel.

- | | | |
|-------------------|---------------------|--------------------------|
| a. pipelining | j. operating system | s. loading |
| b. laser | k. Thrashing | t. memory |
| c. database | l. IP address | u. arithmetic logic unit |
| d. installing | m. control unit | v. serial port |
| e. user interface | n. data | w. domain name |
| f. latency | o. subscribe | x. aggregator |
| g. processor | p. utility | y. browser |
| h. application | q. thermal | z. information |
| i. mobile | r. spreadsheet | |

4. The subscript of a number represents its base. For example, $3A_{16} = 58_{10} = 111010_2$. Perform each of the following operations.
- (1) (5%) Represent the result of $A3_{16} \times 2D_{16}$ in terms of base 16.
 - (2) (5%) Represent the result of x^y in terms of base 2, where $x = 1001_2$ and $y = 100_2$.
5. Write a program that will find all prime numbers less than positive integer N (5%), and justify its correctness (5%).