※ 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

※ 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。

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)　float ((a + b + c + d) / 4.0)

b)　(float (a + b + c + d)) / 4

c)　(a + b + c + d) / 4

d)　(a + b + c + d) / 4.0

e)　(a + 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?

※ 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。

(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%)

※ 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 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%).