

# Introduction to Computer Science: Final Exam

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**Instructions:** This paper consists of fifty multiple choice questions. Each carries 2 marks. You have to answer all of them. For each question, there is only ONE correct answer. Please circle your answer by using either blue or black ball pen. Using dictionary and calculator during examination is allowed.

## Question 1

Which of the following electronic technologies is the key for making the personal computer in the 1970s?

- (a) Transistor
- (b) Integrated circuit
- (c) Microprocessor
- (d) Nanotechnology

## Question 2

What is the name of the first electronic computer in UK?

- (a) ENIAC
- (b) Z3
- (c) UNIVAC
- (d) Colossus

## Question 3

Which of the following statement is wrong?

- (a) Alibaba is an e-commerce firm.
- (b) 7net is an e-commerce firm.
- (c) Travelocity is an e-commerce firm.
- (d) Google is an e-commerce firm.

## Question 4

Which of the following statements can best describe the market of an App Store?

- (a) App Store is a C2C market.
- (b) App Store is a B2B market.
- (c) App Store is a C2B market.
- (d) App Store is a B2C market.

## Question 5

Which of the following statement(s) is(are) true?

- (i) All arithmetic operations can be implemented by logic gates.
- (ii) Representing a negative number in 2's-complement formate can let addition/subtraction easily be done by using full adder.
- (iii) All logic operations can be implemented by NAND gates.

**Answer :**

- (a) (i) & (ii)
- (b) (ii) & (iii)
- (c) (i) & (iii)
- (d) (i), (ii) and (iii)

## Question 6

Convert  $-148_{10}$  in **16-bit 2'S complement formate** and then convert this binary bit patterns in hexadecimal form.

- (a) *FEEB*.
- (b) *FF6B*.
- (c) *FF6C*.
- (d) *FEEC*.

### Question 7

To manage multiple processes running on a single CPU, one common method is called \_\_\_\_\_. Different processes are assigned with different time slots. So that, in each time slot, there is only one process can use the CPU.

- (a) Time-sharing processing
- (b) Parallel processing
- (c) Distributed processing
- (d) None of the above.

### Question 8

Which of the following language is the lowest level language?

- (a) Machine code.
- (b) C language.
- (c) Assembly language.
- (d) SQL.

### Question 9

With reference to ASCII code, what are the bit pattern of the string '0 1'? (Note that there is a space between '0' and '1')

- (a) 001100000011000000110001
- (b) 001100000010000000110001
- (c) 001100000011000000110000
- (d) 001100000010000000110000

### Question 10

What is the contribution of Xerox in the evolution of computer?

- (a) Window OS
- (b) Mouse
- (c) Graphical user interface
- (d) Multi-touch

### Question 11

The truth table of an half adder is shown below.

A	B	C	D
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

The implementation of this half adder can be done by two logic gates, say  $X$  and  $Y$ . Logic gate  $X$  is with  $A$  and  $B$  as input and  $C$  as output, while logic gate  $Y$  is with  $A$  and  $B$  as input and  $D$  as output. What should logic gates  $X$  and  $Y$  are?

- (a)  $X$  is a OR gate, while  $Y$  is an AND gate.
- (b)  $X$  is a XOR gate, while  $Y$  is an AND gate.
- (c)  $X$  is a AND gate, while  $Y$  is an OR gate.
- (d)  $X$  is a AND gate, while  $Y$  is an XOR gate.

### Question 12

To execute an instruction, the CPU will first decode the instruction into a sequence of electrical signals controlling the connections amongst the logic gates. Which of the following unit is responsible for generating such signals?

- (a) Register
- (b) Control unit
- (c) ALU
- (d) Cache

### Question 13

ASCII code is used for encoding characters. With reference to OSI 7-layer model, which layer should this ASCII code be best situated?

- (a) Application
- (b) Presentation
- (c) Session
- (d) Transport

**Question 14**

Which of the following statements is incorrect?

- (a) With reference to the TCP/IP model, HTTP is a protocol defined on the Application layer.
- (b) With reference to the TCP/IP model, HTTPS is a protocol defined on the Application layer.
- (c) With reference to the TCP/IP model, SSL is defined above the Transport layer.
- (d) SSL applies only the symmetric encryption technique to establish secure session.

**Question 15**

In TCP/IP model, there is one protocol layer called transport. With reference to the OSI seven-layer model, which layer is responsible for the same functions as this transport layer?

- (a) Application
- (b) Presentation
- (c) Session
- (d) Transport

**Question 16**

With reference to the OSI seven-layer model, where is the Internet Protocol situated?

- (a) Physical
- (b) Data Link
- (c) Network
- (d) Transport

**Question 17**

John opens three browsers in his computer. Two of them (say browsers A and B) connect to the Google searching engine. The other one (say browser C) connects to Gmail. Suppose that the searching engine and the Gmail server are both installed in the same machine. That is to say, they share the same IP address. As we know, we have no problem to open multiple browsers for doing different thing. With reference to the OSI 7-layer model, Which layer(s) is(are) responsible for making it work?

- (i) Session
- (ii) Transport
- (iii) Network

**Answer :**

- (a) (i) & (ii)
- (b) (ii) & (iii)
- (c) (i) & (iii)
- (d) (i), (ii) and (iii)

**Question 18**

Which of the following statements about network protocol is NOT correct?

- (a) Protocol is a set of rules that ensure communications among computers of different types and from different manufacturers.
- (b) Protocol is a set of rules that determine the form of signal being transmitted, encoded, the way that signal error is detected and corrected, etc.
- (c) Protocol is the set of rules proposed by IBM only.
- (d) Whenever a new technology has been introduced and later became commonly used, it can be filed as a new protocol.

**Question 19**

DNS refers to domain name server. Which of the following statements about DNS is wrong?

- (a) Each DNS consists of the IP addresses of all the domain names in the world.
- (b) All the DNSs form a DNS network to facilitate the search of IP address of a domain name.
- (c) Even if all the DNSs are down, we are still able to access a homepage.
- (d) Even if all the DNSs are down, we are still able to send emails.

### Question 20

Which of the following is(are) possible cause(s) for not able to access a homepage?

- (i) The DNS your computer linking to is being attacked by DDoS.
- (ii) The remote web server is under DDoS attack.
- (iii) Your computer has not connected to the Internet.
- (iv) You have wrongly typed the URL.

Answer :

- (a) (i) & (ii)
- (b) (iii) & (iv)
- (c) (i), (ii) and (iii)
- (d) (i), (ii) and (iv)
- (e) (i), (iii) and (iv)
- (f) (ii), (iii) and (iv)
- (g) (i), (ii), (iii) and (iv)

### Question 21

Which of the following languages is the earliest markup language for web page design?

- (a) Extensible Markup Language (XML)
- (b) Hypertext Markup Language (HTML)
- (c) Javascript
- (d) Personal Home Page (PHP)

### Question 22

If one would like to highlight the name of a book (say "Computer Science") in bold face, which of the following tag should be used?

- (a) `<b>Computer Science</b>`
- (b) `<a>Computer Science</a>`
- (c) `<p>Computer Science</p>`
- (d) `<i>Computer Science</i>`

### Question 23

In the source code of a webpage, there is a segment looking like this:

```
<ol>
<li> PhD CSE CUHK
<li> MPhil CSE CUHK
<li> BENG EE PolyU
</ol>
```

Once this webpage is browsed, what will we see?

- (a) a. PhD CSE CUHK  
b. MPhil CSE CUHK  
c. BENG EE PolyU
- (b) 1. PhD CSE CUHK  
2. MPhil CSE CUHK  
3. BENG EE PolyU
- (c) o PhD CSE CUHK  
o MPhil CSE CUHK  
o BENG EE PolyU
- (d) \* PhD CSE CUHK  
\* MPhil CSE CUHK  
\* BENG EE PolyU

### Question 24

In building a webpage, we can use the anchor tag

```
<a href="...">...</a>
```

to link to a URL. Which of the following files are allowable for this anchor tag to link to?

- (a) Image file
- (b) Video file
- (c) Homepage
- (d) All of them.

### Question 25

Which of the following codes is correct?

- (a) `<B><I>Computer Science</B></I>`
- (b) `</B></I>Computer Science<B><I>`
- (c) `<B><I>Computer Science</I></B>`
- (d) `</B></I>Computer Science<B><I>`

### Question 26

In HTML, the tag

`<H1>...</H1>`

is used for \_\_\_\_\_,

`<P>...</P>`

is used for \_\_\_\_\_.

- (a) drawing a horizontal line with one line thick, formatting the content within in bold face
- (b) drawing a horizontal line with one line thick, formatting the content within as a paragraph
- (c) formatting the content within as a section heading, formatting the content within in bold face
- (d) formatting the content within as a section heading, formatting the content within as a paragraph

### Question 27

In EXCEL, suppose we have on cell C2 an equation

`=A1*B2 + $D$1*E1`.

If this equation is copied and pasted to cell C3, what will the equation be?

- (a) `=A1*B2 + $D$1*E1`
- (b) `=A2*B3 + $D$1*E1`
- (c) `=A1*B3 + $D$1*E2`
- (d) `=A2*B3 + $D$1*E2`

### Question 28

In EXCEL, suppose we want to evaluate the maximum of the values from B1 to B10 and display the value on B12. What should the equation be put on cell B12?

- (a) `=SUM(B1:B10)`
- (b) `=AVERAGE(B1:B10)`
- (c) `=COUNT(B1:B10)`
- (d) `=MAX(B1:B10)`

### Question 29

Suppose the mid-term examination scores of the students are put in cells A1 to A10. Then, we would like to show from B1 to B10 if the student's performance is GOOD (score is above or equal to 90) or POOR (score is below 60). So, we need first to add an equation on B1 and then paste that equation to B2, B3, ... B10. What should the equation be put on cell B1?

- (a) `=IF(A1>90,"GOOD", IF(A1<60,"POOR",""))`
- (b) `=IF(A1>90, "GOOD", A1<60, "POOR")`
- (c) `=IF(NOT(A1>90,A1<60), "GOOD","POOR")`
- (d) `=IF(A1<60,"POOR", IF(A1>=90,"GOOD",""))`

### Question 30

The values in the cells A1, A2, A3, A4, A5 and A6 are 61, 64, 44, 76, 60 and 87 respectively. Cell B2 is used for showing the number of records with values larger than 60. Which of the following statements about the equation and the value shown in B2 is correct?

- (a) The equation is  
`=COUNTIF(A1:A6; >60)`  
and its value is 4.
- (b) The equation is  
`=COUNTIF(A1:A6; >60)`  
and its value is 5.
- (c) The equation is  
`=COUNTIF(A1:A6; ">60")`  
and its value is 4.
- (d) The equation is  
`=COUNTIF(A1:A6; ">60")`  
and its value is 5.

**Question 31**

For asymmetric encryption algorithms, the sender and the receiver use \_\_\_\_\_ to encrypt and decrypt messages. For symmetric encryption algorithms, the sender and the receiver use \_\_\_\_\_ to encrypt and decrypt messages.

- (a) the same key, the same key
- (b) the same key, different keys
- (c) different keys, the same key
- (d) different keys, different keys

**Question 32**

Which of the following statements about asymmetric and symmetric encryption methods is wrong?

- (a) Asymmetric encryption methods are usually applied in short message encryption.
- (b) Symmetric encryption methods are usually applied in long message encryption.
- (c) Both asymmetric and symmetric encryption methods are suitable for both short and long message.
- (d) Asymmetric encryption methods are usually applied in "secure key" encryption.

**Question 33**

John sends a message to Mary with a digital signature. Peter somehow gets a copy of the message. Which of the followings will happen?

- (a) Mary can read the message but Peter cannot.
- (b) Peter can read the message but Mary cannot.
- (c) Both Mary and Peter cannot read the message.
- (d) Both Mary and Peter can read the message.

**Question 34**

John encrypts a message by using first his own private key and the encrypted message is further encrypted by Mary's public key. This double encrypted message is sent to Mary. Peter somehow gets a copy of the double encrypted message. Which of the followings will happen?

- (a) Mary can read the message but Peter cannot.
- (b) Peter can read the message but Mary cannot.
- (c) Both Mary and Peter cannot read the message.
- (d) Both Mary and Peter can read the message.

**Question 35**

John encrypts a message by using first Mary's public key and then the encrypted message is further encrypted by his own private key. This double encrypted message is sent to Mary. Peter somehow gets a copy of the double encrypted message. Which of the followings will happen?

- (a) Mary can read the message but Peter cannot.
- (b) Peter can read the message but Mary cannot.
- (c) Both Mary and Peter cannot read the message.
- (d) Both Mary and Peter can read the message.

**Question 36**

Which of the following methods is NOT a correct method for encryption?

- (a) John encrypts the letter first by using his public key. While Mary has received the message, she decrypts the message by using John's public key.
- (b) John encrypts the letter by using Mary's public key. While Mary has received the message, she decrypts the message by using her private key.

- (c) John encrypts the letter first by using Mary's private key and then by using his public key. While Mary has received the message, she decrypts the message first by using John's private key and then by using her public key.
- (d) John encrypts the letter first by using Mary's public key and then by using his private key. While Mary has received the message, she decrypts the message first by using John's public key and then by using her private key.

**Question 37**

What is the full name of ARPA?

- (a) Advanced Research Projects Agency
- (b) Advanced Research Project Agency
- (c) Advance Research Projects Agency
- (d) Advance Research Project Agency

**Question 38**

What did Paul Barron propose in the computer network design?

- (a) Circuit switching
- (b) Packet switching
- (c) Queuing theory
- (d) Terminal communication

**Question 39**

The first browser is developed by \_\_\_\_\_ in \_\_\_\_\_.

- (a) Tim Berners-Lee, 1992.
- (b) Tim Berners-Lee, 1993.
- (c) Marc Anderssen, 1992.
- (d) Marc Anderssen, 1993.

**Question 40**

What killer application dramatically changed the use of APRANET and who developed that killer application?

- (a) Packet switching, Leonard Kleinrock.
- (b) Terminal, Bob Taylor.
- (c) Email, Ray Tomlinson.
- (d) Vinton Cerf & Bob Kahn, TCP/IP.

**Question 41**

For an Internet connection with transmission rate 56Kbps, what will be the maximum size of a file that can be transmitted in ONE MINUTES?

- (a) 56K Bytes
- (b) 3360K Bytes
- (c) 56K bits
- (d) 420K Bytes

**Question 42**

Which of the following functions are NOT done by a compiler?

- (i) Check logical error.
- (ii) Correct logical error.
- (iii) Check syntax error.
- (iv) Correct syntax error.

**Answer:**

- (a) (i) and (ii) only.
- (b) (ii) and (iii) only.
- (c) (i) and (iii) only.
- (d) (i), (ii) and (iv).

### Question 43

Below is a program demonstrating how to enter a string.

```
#include<stdio.h>

main() /* Main function. */
{
int YOB; /* Define integer variable YOB. */
int Age; /* Define integer variable Age */
char Name[32]; /* String for Name. */

printf("Please enter your name: ");
scanf("%s", Name);
printf("Enter your year of birth: ");
scanf("%d", &YOB);

Age = 2014 - YOB;
printf("%s, your YoB is %d.\n", Name, YOB);
printf("So, your age is %d.\n", Age);
}
```

If the name entered is Peter and the year of birth 1990, what will you see on the screen?

- (a) Peter, your YoB is 1990. So, your age is 24.  
c:\>
- (b) Peter, your YoB is 1990.  
So, your age is 24.  
c:\>
- (c) Peter, your YoB is 1990.  
So, your age is 24.  
c:\>
- (d) Peter, your YoB is 1990.  
  
So, your age is 24.  
c:\>

### Question 44

Refer to Program A. (i) What will you see after you have entered "a"? (ii) What will you see after you have entered "c"?

- (a) (i)  
You have successfully registered MKT.  
You are now the 46 number of student.  
(ii)  
You have successfully registered ACCT.  
You are now the 36 number of student.

- (b) (i)  
You have successfully registered MKT.  
You are now the 46 number of student.  
(ii)  
You have successfully registered ACCT.  
You are now the 35 number of student.
- (c) (i)  
You have successfully registered ACCT.  
You are now the 36 number of student.  
(ii)  
(Nothing will be shown.)
- (d) (i)  
You have successfully registered MKT.  
You are now the 46 number of student.  
(ii)  
(Nothing will be shown.)

### Question 45

Refer to Program B. If the following command is typed on the console, what will you see on the screen?

```
c:\>bubblesort a 3 6 5 4 7 9 11
```

- (a) a 3 4 5 6 7 9 11
- (b) a 3 4 5 6 7 9 11  
c:\>
- (c) 3 4 5 6 7 9 11  
c:\>
- (d) 3 4 5 6 7 9 11  
c:\>

### Question 46

Refer to Program B. If the following command is typed on the console, what will you see on the screen?

```
c:\>bubblesort 3 6 5 4 7 9 11
```

- (a) 11 9 7 6 5 4 3  
c:\>
- (b) 11 9 7 6 5 4 3  
c:\>
- (c) 11 9 7 6 5 4  
c:\>



- (d) 11 9 7 6 5 4  
c:\>

**Question 47**

Refer to Program B. If there are 10 numbers to be sorted, how many "pairwise comparisons" are required for the program to do this sorting.

- (a) 100
- (b) 81
- (c) 50
- (d) 45

**Question 48**

Refer to Program B. What is the maximum number of numbers the program can sort?

- (a) 15
- (b) 16
- (c) 17
- (d) Unlimited

**Question 49**

If the following C program segment is executed, what will you see on the screen?

```
for (i=1,i<5, i++)
{
    printf("*");
    printf("/n");
}
```

- (a) \*\*\*\*\*
- (b) \*  
\*  
\*  
\*  
\*
- (c) \*\*\*\*
- (d) \*  
\*  
\*  
\*

**Question 50**

If the following C program segment is executed, what will you see on the screen?

```
i=0;
While (i<=2)
{ printf("*");
  i = i+1;
}
printf("%d\n", i);
```

- (a) \*\*2
- (b) \*\*3
- (c) \*\*\*3
- (d) \*\*\*4

## Program A

The filename of the following program is "registration.cpp".

```
#include<stdio.h>

main() /* Main function. */
{
int SNM; /* Current no. of students in Marketing. */
int SNA; /* Current no. of students in Accounting. */
char Choice; /* Define a character variable Choice. */

SNM = 45; SNA = 35;
printf("Which course you would like to register?\n");
printf("a: Marketing, b: Accounting\n");
printf("Please enter your choice (a or b): ");
scanf("%c", &Choice);

if (Choice == 'a')
{
    SNM = SNM + 1;
    printf("You have successfully registered MKT.\n");
    printf("You are now the %d number of student.", SNM);
}
else
{
    SNA = SNA + 1;
    printf("You have successfully registered ACCT.\n");
    printf("You are now the %d number of student.", SNA);
}
}
```

## Program B

The filename of the following program is "bubblesort.cpp".

```
#include<stdio.h>
#include<stdlib.h>

int main(int argc, char *argv[])
{
    int A[16]; /* Define integer array. */
    int i,j; /* Define indices. */
    int tmp; /* Define dummy variable for sorting. */
    char Opt = 'c'; int SNUM;

    /* Step 1: Read input from the command line. */
    SNUM = argc - 2;
    Opt = argv[1][0];
    for(i = 0; i<argc-2; i++)
        A[i] = atoi(argv[i+2]);

    /* Step 2: Sorting the numbers */
    if(Opt == 'a')
        for(i=0; i<SNUM-1; i++)
            for(j=0; j<SNUM-i-1; j++)
            {
                if(A[j] > A[j+1])
                {
                    tmp = A[j];
                    A[j] = A[j+1];
                    A[j+1] = tmp;
                }
            }
    else
        for(i=0; i<SNUM-1; i++)
            for(j=0; j<SNUM-i-1; j++)
            {
                if(A[j] < A[j+1])
                {
                    tmp = A[j];
                    A[j] = A[j+1];
                    A[j+1] = tmp;
                }
            }

    /* Step 3: Show the results */
    printf("The sorted numbers are");
    for(i=0; i<SNUM; i++)
        printf(" %d", A[i]);
    printf(".\n");
}
```