

# Introduction to Computer Science: Mid-Term Exam

November 16, 2012

Name: \_\_\_\_\_

Student ID: \_\_\_\_\_

## Question 1

If the hardware of a computer is analog to the body of a human being, which of the following is the best description of the software.

- (a) Language
- (b) Blood
- (c) Mind
- (d) Neuron

## Question 2

What was the original use of computers?

- (a) For playing game.
- (b) For data storage.
- (c) Computation.
- (d) Factory automation.

## Question 3

Which of the following electronic technologies is the key technology for making the *first generation electronic computer*?

- (a) Transistor
- (b) Integrated circuit
- (c) Vacuum tube
- (d) Dual Core CPU

## Question 4

During World War II, which of the following country did not have an electronic computer?

- (a) France
- (b) Germany
- (c) England
- (d) USA

## Question 5

What is the name of the first commercial computer in US?

- (a) IBM System/360
- (b) UNIVAC
- (c) Macintosh
- (d) ENIAC

## Question 6

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

- (a) Window
- (b) Mouse
- (c) A4 paper
- (d) Touch screen

## Question 7

Information is a set of data that have been shaped into a form that is \_\_\_\_\_.

- (a) meaningless and useless to human being
- (b) meaningful and useful to human being

- (c) meaningless and useless to information systems
- (d) meaningful and useful to information systems

**Question 8**

Data is a stream of \_\_\_\_\_ representing *events* occurring in organization.

- (a) raw fact
- (b) meaningful information
- (c) information
- (d) numbers

**Question 9**

An information system is a set of interrelated components that \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and distribute information to \_\_\_\_\_ in an organization.

*Which of the following should NOT be put in the blanks ?*

- (a) collect
- (b) process
- (c) store
- (d) make decision

**Question 10**

The mission of an information system is to improve the performance of \_\_\_\_\_ through the use of information technology.

- (a) computers in organizations
- (b) people in organizations
- (c) computer network
- (d) people network

**Question 11**

Which of the following items are part of information technologies ?

- (i) Digital camera
- (ii) Mobile phone
- (iii) Internet

**Answer :**

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

**Question 12**

In terms of management level, how can the following information systems be ranked (from high level to low level) ?

- (1) Transaction processing systems
- (2) Executive information systems
- (3) Management information systems
- (4) Decision support systems

**Answer :**

- (a) 1, 2, 3, 4
- (b) 2, 3, 4, 1
- (c) 2, 4, 1, 3
- (d) 2, 4, 3, 1

**Question 13**

Which of the following operation(s) a computer is(are) able to perform?

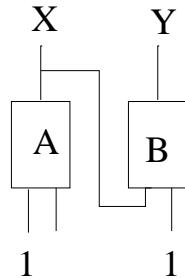
- (i) Arithmetic operation.
- (ii) Logic operation.

**Answer :**

- (a) (i) only
- (b) (ii) only
- (c) (i) & (ii)
- (d) None of them

### Diagram for Questions 14-18

The following schematic diagram is for Question 14 to Question 18. It is a circuit consisting of two logic gates.



#### Question 14

What are the output values  $X$  and  $Y$  if A is an XOR gate and B is an AND gate.

- (a)  $X = 0, Y = 0.$
- (b)  $X = 0, Y = 1.$
- (c)  $X = 1, Y = 0.$
- (d)  $X = 1, Y = 1.$

#### Question 15

What are the output values  $X$  and  $Y$  if A is an OR gate and B is an OR gate.

- (a)  $X = 0, Y = 0.$
- (b)  $X = 0, Y = 1.$
- (c)  $X = 1, Y = 0.$
- (d)  $X = 1, Y = 1.$

#### Question 16

What are the output values  $X$  and  $Y$  if A is an AND gate and B is an XOR gate.

- (a)  $X = 0, Y = 0.$
- (b)  $X = 0, Y = 1.$
- (c)  $X = 1, Y = 0.$
- (d)  $X = 1, Y = 1.$

#### Question 17

What are the output values  $X$  and  $Y$  if A is an OR gate and B is an NAND gate.

- (a)  $X = 0, Y = 0.$
- (b)  $X = 0, Y = 1.$
- (c)  $X = 1, Y = 0.$
- (d)  $X = 1, Y = 1.$

#### Question 18

What are the output values  $X$  and  $Y$  if A is an NAND gate and B is an NAND gate.

- (a)  $X = 0, Y = 0.$
- (b)  $X = 0, Y = 1.$
- (c)  $X = 1, Y = 0.$
- (d)  $X = 1, Y = 1.$

#### Question 19

Convert  $20_{10}$  in 8-bit 2'S complement formate.

- (a)  $10010100_2$
- (b)  $00010100_2$
- (c)  $10001010_2$
- (d)  $00001010_2$

#### Question 20

Convert  $-20_{10}$  in 8-bit 2'S complement formate.

- (a)  $10010100_2$
- (b)  $00010100_2$
- (c)  $11101011_2$
- (d)  $11101100_2$

#### Question 21

Convert  $20_{10}$  in 16-bit 2'S complement formate.

- (a)  $1000000010010100_2$
- (b)  $0000000000010100_2$
- (c)  $1000000000001010_2$
- (d)  $0000000000001010_2$

**Question 22**

Convert  $-20_{10}$  in **16-bit 2'S complement formate**.

- (a) 1000000000010100<sub>2</sub>
- (b) 0000000000010100<sub>2</sub>
- (c) 1000000001101011<sub>2</sub>
- (d) 111111111101100<sub>2</sub>

**Question 23**

$x$  and  $y$  are two binary numbers which are in **4-bit 2's complement formate**, where

$$x = 0010_2 \text{ and } y = 1101_2.$$

Clearly,  $y$  is a negative number. What is the result of  $x + y$  in decimal formate?

- (a)  $1_{10}$
- (b)  $-1_{10}$
- (c)  $0_{10}$
- (d)  $-7_{10}$

**Question 24**

$x$  and  $y$  are two binary numbers which are in **4-bit 2's complement formate**, where

$$x = 0010_2 \text{ and } y = 0001_2.$$

Clearly, both of them are positive. What is the result of  $x + y$  in decimal formate?

- (a)  $1_{10}$
- (b)  $-1_{10}$
- (c)  $3_{10}$
- (d)  $-3_{10}$

**Question 25**

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 26**

The following is the truth table of a full adder. What are the values  $X$  and  $Y$ ?

A	B	D	C	Z
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	X	0
1	1	0	1	0
1	1	1	1	Y

- (a)  $X = 0, Y = 0.$
- (b)  $X = 0, Y = 1.$
- (c)  $X = 1, Y = 0.$
- (d)  $X = 1, Y = 1.$

**Question 27**

Which of the following items are part of information technologies ?

- (i) Programming language
- (ii) Operating system
- (iii) Database

**Answer :**

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

### Question 28

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 29

What does MBytes stand for ?

- (a)  $10^0$  Bytes (or  $2^0$  Bytes)
- (b)  $10^3$  Bytes (or  $2^{10}$  Bytes)
- (c)  $10^6$  Bytes (or  $2^{20}$  Bytes)
- (d)  $10^9$  Bytes (or  $2^{30}$  Bytes)

### Question 30

C Programming language is \_\_\_\_\_ for writing software.

- (a) a communication scheme
- (b) a coding scheme
- (c) a Visual Basic interface
- (d) a .NET interface

### Question 31

To convert a C program to machine code, we need to use a \_\_\_\_\_.

- (a) DevC compiler
- (b) Java Development Kit
- (c) Visual Basic Compiler
- (d) Dictionary

### Question 32

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

int main(void){
    printf("Hello world!\n");

    system("PAUSE");
    return 0;
}
```

After compiling the above C program. What will you see on the computer screen?

- (a) "Hello world"
- (b) "Hello world!"
- (c) Hello world
- (d) Hello world!

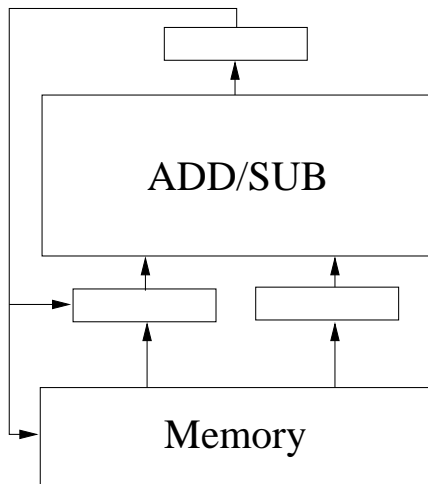
### Question 33

In the above program, the files **stdio.h** and **stdlib.h** are commonly called \_\_\_\_\_ files. They \_\_\_\_\_.

- (a) help; help
- (b) header; help
- (c) help; define the operations of the functions like **printf** and **system**
- (d) header; define the operations of the functions like **printf** and **system**

### Diagram for Questions 34-35

Below is a simple circuit. It consists of a **memory** with 16 memory spaces (from M1 to M16), an **ADD/SUB block**, 2 **input registers** (IA and IB) and one **output register** (OUT). M1 to M16, IA, IB and OUT are all 4 bits long.



To control the above circuit, three commands (MOV, ADD and SUB) are provided. The syntax and the descriptions of these commands are depicted in the following table.

Syntax	Description
MOV X Y	Moving the content of Y to X
ADD X Y	$OUT = X + Y$
SUB X Y	$OUT = X - Y$

### Question 34

-----  
 MOV IA M1  
 MOV IB M2  
 ADD IA IB  
 MOV IA OUT  
 MOV IB M3  
 ADD IA IB  
 MOV M4 OUT  
 -----

Suppose the initial contents of M1, M2, M3 and M4 are given by

$M1 = 0010, M2 = 0001, M3 = 0010, M4 = 0000.$

What is the content of M4 once the program is finished?

- (a) 0010
- (b) 0011
- (c) 0111
- (d) 0101

### Question 35

-----  
 MOV IA M1  
 MOV IB M2  
 ADD IA IB  
 MOV IA OUT  
 MOV IB M3  
 SUB IA IB  
 MOV M4 OUT  
 -----

Suppose the initial contents of M1, M2, M3 and M4 are given by

$M1 = 0011, M2 = 0010, M3 = 0001, M4 = 0000.$

What is the content of M4 once the program is finished?

- (a) 0010
- (b) 0011
- (c) 0100
- (d) 0101

### Question 36

Which of the following is the language for use in the first generation electronic computer?

- (a) Natural language.
- (b) High level language.
- (c) C language
- (d) Machine code.

### Question 37

The logic function of the following truth table is given by

$$Z = \bar{A}BC + A\bar{B}\bar{C}.$$

A	B	C	Z
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	X
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	Y

What are the values of  $X$  and  $Y$ ?

- (a)  $X = 0, Y = 0$ .
- (b)  $X = 0, Y = 1$ .
- (c)  $X = 1, Y = 0$ .
- (d)  $X = 1, Y = 1$ .

**Question 38**

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

- (i) All logic circuits can be built by using NAND gates only.
- (ii) All logic circuits can be built by using AND gates only.
- (iii) All logic circuits can be built by using XOR gates only.

**Answer:**

- (a) (i) only.
- (b) (ii) only.
- (c) (iii) only.
- (d) None of them.

**Question 39**

For a binary number which is represented in 6-bit 2's complement formate, what are the smallest and the largest numbers that can be represented?

- (a)  $-15$  to  $15$ .
- (b)  $-31$  to  $31$ .
- (c)  $-63$  to  $63$ .
- (d)  $0$  to  $63$ .

**Question 40**

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

- (i) Smartphone is able to connect to the Internet via 3G telecom network.
- (ii) Smartphone is able to connect to the Internet via WiFi.

(iii) WiFi is another name for 3G telecom network.

**Answer:**

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