

Introduction to Computer Science: Mid-Term Exam

November 11, 2016. 9:30 - 11:00

Name: _____

Student ID: _____

Instructions: This paper consists of 50 multiple choice questions. You have to answer all of them. Each carries two marks. Each question has only one correct option. Please put down the answer clearly next to the question number.

Question 1

Which of the following persons proposed the first conceptual model of computer?

- (a) Charles Babbage
- (b) Alan Turing
- (c) John von Neumann
- (d) John Sum

Question 2

In US, which university designed and built the first electronic computer?

- (a) MIT
- (b) Harvard
- (c) Stanford
- (d) University of Pennsylvania

Question 3

Which of the following statement is true?

- (a) Computer was invented long before WWII.
- (b) Computer was invented just before WWII.
- (c) Computer was invented during WWII.
- (d) Computer was invented after WWII.

Question 4

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

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

Question 5

In UK, which company successfully built the first commercial computer?

- (a) Lyon
- (b) LEO
- (c) Mauchly & Eckert Company
- (d) Remington Rand

Question 6

In US, which company successfully built the first commercial computer?

- (a) Lyon
- (b) LEO
- (c) Mauchly & Eckert Company
- (d) Remington Rand

Question 7

Who invented the vacuum tube?

- (a) Thomas Edison.
- (b) Charles Babbage.
- (c) John Ambrose Fleming.
- (d) John Vacuum.

Question 8

Which of the following statement about information system is true?

- (a) An information system is a set of inter-related components that collect, process, store, and distribute information to make decisions and control in an organization.
- (b) An information system is a set of interrelated components that process, store, and distribute information to support decision making and control in an organization.
- (c) Human being is not part of an information system.
- (d) None of the above.

Question 9

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

- (i) Without electricity, it is not possible to have an information system.
- (ii) Without computer, it is not possible to have an information system.
- (iii) The function of an information system is determined by the business operations.

Answer:

- (a) (i) only
- (b) (i) & (ii) only
- (c) (iii) only
- (d) (ii) & (iii) only

Question 10

If the statement *John Sum is a handsome guy.* is treated as an information. Which of the following thing(s) could be treated as a data?

- (a) John
- (b) John Sum
- (c) J
- (d) All of the above.

Question 11

In term of size of memory, which of the following order is correct?

- (a) Cache > Hard Disk > RAM > Register
- (b) Cache < Hard Disk < RAM < Register
- (c) Register < Cache < RAM < Hard Disk
- (d) Register > Cache > RAM > Hard Disk

Question 12

In accordance with the level of difficulties, what should be the correct ranking of the following skills.

- (a) Using WORD > Design and Develop WORD > Design and Develop Window
- (b) Using Window > Design and Develop Window > Using WORD
- (c) Design and Develop Window > Design and Develop WORD > Using WORD
- (d) None of the above.

Question 13

In which of the following website(s) intelligent technologies have been used?

- (i) Goolge
- (ii) Amazon
- (iii) Facebook
- (iv) YouTube

Answer:

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

Question 14

In accordance with John Sum's viewpoint, which of the following systems is inevitable in an organization?

- (a) Transaction processing system.
- (b) Management information system.
- (c) Decision support system.
- (d) Executive information system.

Question 15

Which of the following factors leading to the change of information management?

- (i) Business environment.
- (ii) Technologies advancement.
- (iii) Management practises.

Answer:

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

Question 16

Which of the following website is a C2C e-marketplace?

- (a) Amazon
- (b) eBay
- (c) Google
- (d) Bin

Question 17

In an e-marketplace, like eBay, who is(are) the customers of this e-marketplace.

- (a) The people who buy things via this platform.
- (b) The people who sell things via this platform.
- (c) Both buyers and sellers who buy and sell things via this platform.
- (d) Both buyers and sellers are not the customers of the e-marketplace.

Question 18

What is the business model of Google Play?

- (a) B2B
- (b) B2C
- (c) C2B
- (d) C2C

Question 19

Which of the following statement is true?

- (a) CPU and GPU are both CISC processors.
- (b) CPU and GPU are both RISC processors.
- (c) CPU is a CISC processor and GPU is a RISC processor.
- (d) CPU is a RISC processor and GPU is a CISC processor.

Question 20

Once a computer has been turned on, where does the CPU get the first instruction to execute?

- (a) RAM
- (b) Hard disk
- (c) Register
- (d) BIOS

Question 21

Which of the following clock speeds is close to the clock speed of nowadays CPU?

- (a) 2.5 Kilo Hertz (KHz)
- (b) 2.5 Mega Hertz (MHz)
- (c) 2.5 Giga Hertz (GHz)
- (d) 2.5 Tera Hertz (THz)

Question 22

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 23

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

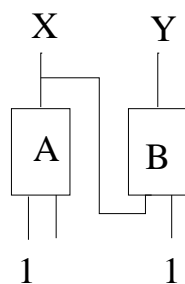
- (i) All arithmetic operations can be implemented by logic gates.
- (ii) All logical operations can be implemented by logic gates.
- (iii) All digital circuits can be implemented by NAND gates only.

Answer :

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

Diagram for Questions 24-29

The following schematic diagram is for Question 22 to Question 26. It is a circuit consisting of two logic gates.



Question 24

What are the output values X and Y if A is an XOR gate, B is an AND gate and the input (from left to right) is 101?

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

Question 25

What are the output values X and Y if A is an OR gate, B is an OR gate and the input (from left to right) is 111?

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

Question 26

What are the output values X and Y if A is an AND gate, B is an XOR gate and the input (from left to right) is 101?

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

Question 27

What are the output values X and Y if A is an OR gate, B is an NAND gate and the input (from left to right) is 111?

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

Question 28

What are the output values X and Y if A is an NAND gate and B is an NAND gate and the input (from left to right) is 111?

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

Question 29

What are the output values X and Y if A is an OR gate, B is an AND gate and the input (from left to right) is $1x1$? Here, 'x' means that the second input is unknown.

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

Question 30

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 31

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	X	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	Y
1	1	1	1	1

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

Question 32

What is the maximum number that can be represented by using 16 bits unsigned binary number?

- (a) $2^{16} - 1$
- (b) $2^{15} - 1$
- (c) $1 - 2^{16}$
- (d) $1 - 2^{15}$

Question 33

What is the minimum number that can be represented by using 16 bits 2's complement?

- (a) $2^{16} - 1$
- (b) $2^{15} - 1$
- (c) $1 - 2^{16}$
- (d) $1 - 2^{15}$

Question 34

What is the value of the unsigned integer '1000000000000000' in decimal form?

- (a) $2^{17}.$
- (b) $2^{16}.$
- (c) $2^{15}.$
- (d) 0.

Question 35

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 36

Convert -5000_{10} in **16-bit 2'S complement formate** and then convert this binary bit patterns in hexadecimal form.

- (a) *EA76*.
- (b) *EA78*.
- (c) *EC76*.
- (d) *EC78*.

Question 37

When did US start her APARNET project?

- (a) 1940s.
- (b) 1950s.
- (c) 1960s.
- (d) 1970s.

Question 38

With reference to ASCII code, what are the bit patterns of the characters '0', '1' and '2'?

- (a) 00110010, 00110001, 00110000
- (b) 00110000, 00110001, 00110010
- (c) 00011110, 00011111, 00100000
- (d) 00100000, 00011111, 00011110

Question 39

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 40

With reference to ASCII code, what is the correct coding in hexadecimal form for the message 'John Sum'?

- (a) 4A4F484E2053554D
- (b) 4A6F686E2053756D
- (c) 6A6F686E2073756D
- (d) 4A6F686E2053554D

Question 41

With reference to ASCII code, what is the coding of the function key 'Cancel' in binary formate?

- (a) 00010010
- (b) 10010000
- (c) 00010100
- (d) 00011000

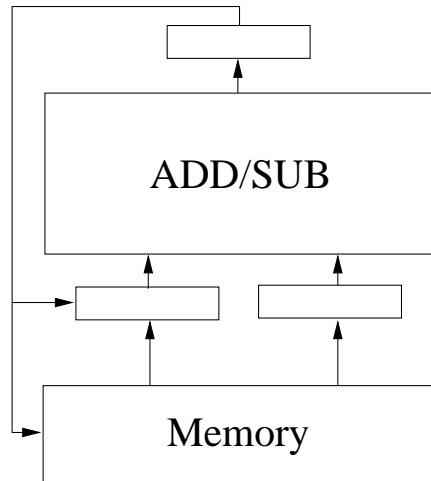
Question 42

In the ASCII code table, there are many strange characters like codes from number 128 to 159. What are the reasons why we need to consider these characters?

- (a) To support European language.
- (b) To support Asian language.
- (c) To support African language.
- (d) To support South American language.

Diagram for Questions 43-46

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 43

```
-----
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 44

```
-----
MOV IB M1
MOV IA M2
ADD IA IB
MOV IA OUT
MOV IB M4
ADD IA IB
MOV M3 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) 0000

Question 45

```
-----
MOV IA M1
MOV IB M2
ADD IA IB
MOV IA OUT
MOV IB M3
ADD IA IB
MOV IA OUT
MOV IB M4
SUB IA IB
MOV M5 OUT
-----
```

Suppose the initial contents of M1, M2, M3, M4 and M5 are given by

$M1 = 0011, M2 = 0010, M3 = 0001,$
 $M4 = 0100, M5 = 0110.$

What are the contents of IA, IB, OUT and M5 once the program is finished?

- (a) $IA = 0100, IB = 0110, OUT = 0010, M5 = 0010$
- (b) $IA = 0000, IB = 0000, OUT = 0000, M5 = 0010$
- (c) $IA = 0110, IB = 0100, OUT = 0010, M5 = 0010$
- (d) $IA = 0100, IB = 0110, OUT = 0000, M5 = 0010$

Question 46

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

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

Which one of the following programs performs the function equivalent to that

$$M3 = M1 - M2.$$

- (a) -----
MOV IB M1
MOV IA M2
SUB IA IB
MOV IA OUT

- (b) -----
MOV IA M1
MOV IB M2
SUB IA IB
MOV IA OUT

- (c) -----
MOV IB M1
MOV IA M2
SUB IA IB
MOV M3 OUT

- (d) -----
MOV IA M1
MOV IB M2
SUB IA IB
MOV M3 OUT

Question 47

Which of the following statements are true?

- (i) Smartphone can connect to the Internet via 3G telecom network.
- (ii) Smartphone can connect to the Internet via WiFi.
- (iii) Smartphone can only have one CPU.
- (iv) Smartphone is a combination of a computer and a telephone.

Answer:

- (a) (i) and (ii) only.
- (b) (ii) and (iv) only.
- (c) (i) and (iii) only.
- (d) (iii) and (iv) only.
- (e) (i), (ii) and (iii) only.
- (f) (i), (ii) and (iv) only.
- (g) (ii), (iii) and (iv) only.
- (h) All of them.

Question 48

In which of the following software, AI technology has been applied.

- (i) MS WORD
- (ii) PowerPoint
- (iii) Internet Explorer

Answer:

- (a) (i) and (ii) only.
- (b) (ii) and (iii) only.
- (c) (i) and (iii) only.
- (d) All of them.

Question 49

Which of the following operating system(s) can be found in smartphones?

- (i) MacOS
- (ii) iOS
- (iii) Safari

Answer:

- (a) (i) only.
- (b) (ii) only.
- (c) (ii) and (iii) only.
- (d) (i) and (ii) only.
- (e) All of them.

Question 50

In the history of Apple, what contributions she has made that change the world?

- (i) She made the first computer using micro-processor.
- (ii) She developed the first computer with graphical user interface for controlling the operating system.
- (iii) She developed the first cell phone using multi-touch technology.

Answer:

- (a) (i) and (ii) only.
- (b) (ii) and (iii) only.
- (c) (i) and (iii) only.
- (d) All of them.