Review Questions

November 20, 2014

1 Digital Systems (Cont'd)

Question 1

(a) CPU is made up of logic gates. TRUE/FLASE

(b) State five basic hardware components of a computer.

(c) What is the basic function of control unit?

(d) what is the basic function of ALU?

(e) What is clock speed?

(f) What is the clock speed of an Intel Core i7 chip?

(g) Normally, each computer has a 500 gigabytes main memory and 4 gigabytes RAM. Inside the CPU (Intel Core i5-3230M), there is 3 megabytes cache. State any one function of this cache.

Question 2

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 3

In terms of the speed of storage a byte of data, what should be the correct rank of the following storage devices?

(a) Cache > Register > RAM > Hard disk

(b) RAM > Cache > Register > Hard disk

(c) Register > RAM > Cache > Hard disk

(d) Register > Cache > RAM > Hard disk

Question 4

The technique for a CPU operation in which multiple execution phases are performed in a single machine cycle is called _____.

(a) pipelining

(b) running

(c) stopping

(d) flowing

Question 5

To manage multiple processes running on a single CPU, one common method is called _____. Difference 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
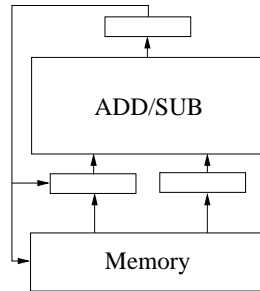
(c) Distributed processing

(d) None of the above.

Question 6

The startup instruction of a computer is stored in _____.

(a) POST

(b) BIOS

(c) CMOS

(d) RAM

Diagram for Questions 7-

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 7

```
----------------
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 8

```
----------------
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 9

```
----------------
MOV IA M1
MOV IB M2
SUB 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

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

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

(a) 0010

(b) 0011

(c) 0100

(d) 0101

Question 10

```
---------------
MOV IA M1
MOV IB M2
SUB 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) 0000

Question 11

```
---------------
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

2 Software/Operating Systems

Question 1

(a) What is a software?

(b) What is system software? Give three examples of system software.

(c) What is application software? Give three examples of application software.

(d) What is the file extension of an executable program?

(e) Once a new printer has been connected to a computer, we need to install a software which is provided by the printer manufacturer. Without installing this software, it is not able to print a document. In computer science, what do we call this kind of software?

(f) State any five functions of an operating system.

(g) What is multitasking? What is multithreading?

(h) What is the difference between in-house development and outsourcing?

(i) What is a programming language?

(j) Interpreter and compiler are both programming language translators. What are their difference(s)?

(k) What is the file extension of a C++ source code?

(l) What is the file extension of a Java source code?

(m) What is the file extension of an html file?

(n) A C program is able to be compiled by a Java compiler. True/False?

(o) Describe in detail what the computer does once its power has been on.

(p) Describe in detail what the computer does once an application software (like IE) has been invoked.