

T62 Tutorial 1

Question 1

Determine the decimal value of the bit pattern 1000 0110, if it is a

(a) 8-bit unsigned binary number

134

(b) 8-bit 2's complement number

-122

(c) BCD code

86

(3 marks)

Question 2

Given the decimal number 20x4. x is the last digit of your student ID number. Represent it as

(a) unsigned binary number

x	number
0	0111 1101 0100
1	0111 1101 1110
2	0111 1110 1000
3	0111 1111 0010
4	0111 1111 1100
5	1000 0000 0110
6	1000 0001 0000
7	1000 0001 1010
8	1000 0010 0100
9	1000 0010 1110

(b) hexadecimal number

x	number
0	7D4
1	7DE
2	7E8
3	7F2
4	7FC
5	806
6	810
7	81A
8	824
9	82E

(4 marks)

Question 3

Given two decimal numbers $A = 207$ and $B = 59$, convert A and B into unsigned binary numbers.

(a) perform $A + B$

1 0000 1010

(b) perform $A - B$

1001 0100

(c) perform $A \div B$

quotient 11, remainder 1 1110

(3 marks)

Question 4

Given two decimal numbers $A = 159$ and $B = -27$, convert A and B into 2's complement numbers.

(a) perform $A + B$

0 1000 0100

(b) perform $A - B$

0 1011 1010

(4 marks)

Question 5

Given two hexadecimal numbers $A = \text{BCD}$ and $B = \text{B6}$.

(a) perform $A + B$

C83

(b) perform $A - B$

B17

(2 marks)

Question 6

Given two decimal numbers $A = 238$ and $B = 59$, convert A and B into BCD codes. Perform $A + B$.

0010 1001 0111

(2 marks)

Question 7

Given a 32-bit address bus.

(a) find the total amount of memory in MB

4096 MB

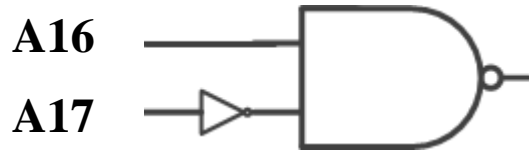
(b) find the total amount of memory in GB

4 GB

(2 marks)

Question 8

In a given byte-addressable computer with an 18-bit address bus, memory locations 10000h to 1FFFFh are available for user programs. Each RAM chip is 64 KB. Design an address decoder circuit, assuming active low memory chip select signal.



(4 marks)