## Computer Organization And Microprocessors **ENCS2380** Mohammed Saada

		_
Q.1: use repres	8-bit floating centation as si to represent	-Point number hown in the following (-3.75)10
1 bit sign bit	3 bits exponent	46its significand

Given ti	he following segme	ent of a byte-addressable memory [i.e. one cell is one byte] in a little-endian
machin	e [i.e. least significo	ant byte at the lowest address]:
Addres	s Memory Content	t de la companya de
	[Hex]	
20	00	
21	80	
22	DD	
23	Cl	
24	00	
Answer	the following ques	tions:
What is	the decimal value	of the 8-bit number at address 22 if we consider it as an unsigned integer?
=	(decimal)	
		of the 8-bit number at address 23 if we consider it as 2's complement signed
integer		
	(decimal)	
What is	the decimal value	of the 16-bit number at address 20 if we consider it as sign-magnitude integer?
	(decimal)	
Mhat is	the decimal value	e of the 8-bit number at address 23 if we consider it is an 8-bit floating-point
	with the following	
Sign: 1 bit	Exponent: 3 bits	Significant: 4   bits
	- N	
What is	the decimal value	e of the 32-bit number at address 20, if we consider it as standard IEEE 32-bit
	-point number	

Q.2:		
A 16-bit memo	ory location contains (F	FE0) <sub>16.</sub> Find the value of this if it represents
1) Two's comp	olement signed integer	[2pts]
2) Sign magni	tude signed integer [2p	ts]
3) Un-signed i	nteger [2pts]	
	ng-point number repre	sented as follow: [4pts] 9 bits significant
8		

Q3: US	e Booth's	algorithm	to find th	e result
of	multiplyin	19 (8) by	(5), clea	rly show
all	multiplying Steps and	Verify yo	ur final an	swer.

A	Q	Q-1	М	Comments

Q.4: How many addition and how many
Subtraction operations are needed when
using Booth's algorithm to multiply a number X by the multiplier "00 110 110 100"
X by the multiplier "00 110 110 100"

Number of Addition Operations:

Number of Subtraction operations:

(a) Address range of 0x00100000 – 0x00100FFF for EEPROM  (b) Address range of 0x40000000 – 0x40007FFF for SRAM  (c) Address range of 0x00000000 – 0x0007FFFF for Flash  (d) Address range of 0xFFFC0000 – 0xFFFFFFFF for peripherals	Q.5;		en ARM chip has the following address assignments. Calculate the space and the nt of memory given to each section.
(c) Address range of 0x00000000 – 0x0007FFFF for Flash		(a)	Address range of 0x00100000 – 0x00100FFF for EEPROM
•		(b)	Address range of $0x40000000 - 0x40007FFF$ for SRAM
(d) Address range of 0xFFFC0000 – 0xFFFFFFF for peripherals		(c)	Address range of 0x00000000 – 0x0007FFFF for Flash
		(d)	Address range of 0xFFFC0000 – 0xFFFFFFF for peripherals

Q.6:	Find th	ne address space range of each of the following memory of an ARM chip:
	(a)	2 KB of EEPROM starting at address 0x80000000
	(b)	16 KB of SRAM starting at address 0x90000000
	(c)	64 KB of Flash ROM starting at address 0xF0000000

Give the value of R2 [in Hex] after the following code is executed:

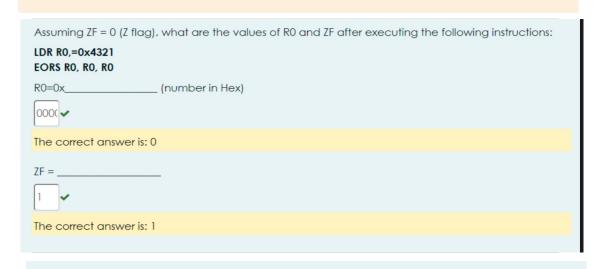
LDR R1,=0xAAAAAAAA

MVN R0,#0

EOR R2,R1,R0

## The correct answer is: 55555555

R2=0x 1010101010101 **x** (write numbers only)



Give the value of R2 [in Hex] after the following code is executed: MOV R0.#0xF0

MOV R1,#0x89 BIC R2,R1,R0

Answer: 09

The correct answer is: 9

- 8. In unsigned multiplication of "MUL R1,R2,R4", the R2 can be maximum of if R4 = 0xFFFFFFFFF.
- 4. Give the value in R2 after the following code is executed:

MOV R0,#0xF0

MOV R1,#0x55

BIC R2,R1,R0

5. Give the value in R2 after the following code is executed:

LDR R1,=0x55555555

register **R2**.

MVN R0,#0

EOR R2,R1,R0

14. Using MOV instruction, show how you rotate left the fixed value of 0x33 total of a) 4, b) 8, and c) 12 times. Also give the value in the register after the rotation.

odes into R1 and R2.	
nd 2 the keyboard gives 0x33 and 0x32, respectively. Write a progran 0x33 and 0x32 to packed BCD and store the result in R2.	1

## Example 4-8

Write a program to toggle all the bits of address 0x40000000 by sending to it the values 0x55 and 0xAA continuously. Put a time delay between each issuing of data to address		
location.		

## Example 4-5

Assume address location 0x200000 is assigned to an input port address and connected to DIP switches. Write a simple short program to check the PORT and whenever both pins 4		
or 6 are LOW, R4 register is incremented.	•	