Microprocessors Systems ECSE 426
Quiz 1

Name: Student ID:

Question 1 : Study the following simple assembly code and answer the questions which follow. The startup code calls **asm_tst_function** which in turn is supposed to call **mystery_Function.** **(5 Marks Total)**

	Instruction Address	Part of the startup_stm32f407xx.s file
1		Reset_Handler PROC
2		EXPORT Reset_Handler
3		[WEAK]
4		IMPORT asm_tst_function
5	0x08000188	LDR R0, =asm_tst_function
6	0x0800018A	BLX R0
7	0x0800018D	NOP
8		ENDP

	Instruction Address	ECE426_Quiz.s assembly file
9		**AREA Quiz, CODE, READONLY**
10		***export*** asm_tst_function
11		***export*** mystery_Function
12		; Filling five words in memory with the values
13		; from 1 - 5
14	0x080001CC	**values** DCD 1, 2, 3, 4, 5
15		ALIGN
16		
17		**asm_tst_function**
18	0x080001E0	LDR R0, =values
19	0x080001E2	LDR R1, =mystery_Function
20	0x080001E4	BLX R1
21	0x080001E6	BX LR
22		
23		**mystery_Function**
24	0x080001E8	MOV R3, #4
25	0x080001EC	LDR R4, [R0]
26		**REPEAT**
27	0x080001EE	ADD R0, R0, #4
28	0x080001E0	LDR R5, [R0]
29	0x080001F2	ADD R4, R4, R5
30	0x080001F4	SUBS R3, R3, #1
31	0x080001F6	BNE REPEAT ;BNE: Branch if Not Equal
32	0x080001F8	BX R14
33		**END**

1. When the instruction "BLX R0" at line 6, executes, what is the value of the Link Register (LR or R14)? ________________ **(0.5 Mark)**

2. What does "**mystery_Function**" do? **(1 Mark)**

3. Suppose that we are to call “**mystery_Function”** from **C,** write the function prototype and function call to do that for the same set of ***values*** (assume values is defined in the C file instead) **(1 Mark)**

4. List the changes/code modifications you need to do to the code to accept floating point numbers instead? **(1 Mark)**

5. Suppose we need to pass the size of the set ***values*** from C as a second parameter, what changes to the **assembly code** of “**mystery_Function”** are required? Write your modifications here. **(1 Mark)**

6. How does the code behave when instruction **BX LR** at line 21 executes, and why? **(0.5 Mark)**