FAST School of Computing

Fall-2023

Islamabad Campus

EE-2003 Computer Organization and Assembly Language

Tuesday, 26th September 2023.

Serial No:

Sessional Exam-I **Total Time: 1 Hour**

Total Marks: 60

Course Instructor

Mr. Farrukh Bashir, Mr. Aqib Rehman, Dr. Waseem

Abbas, Mr. Shams Farooq, Mr. Obaid Ullah

meeg Malik 221-1167 B

DO NOT OPEN THE QUESTION BOOK OR START UNTIL INSTRUCTED.

Instructions:

1. Attempt all questions on the question-book. Read the question carefully, understand the question, and then attempt it.

2. No additional sheet will be provided for rough work. Use the provided space for rough work

3. After asked to commence the exam, please verify that you have SIX (6) different printed pages including this title page. There are a total of $\underline{5}$ questions.

4. Calculator sharing is strictly prohibited.

5. Use permanent ink pens only. Any part done using soft pencil will not be marked and cannot be claimed for rechecking.

	Q-1	Q-2	Q-3	Q-4	Q-5	Total	
Marks Obtained	10	10	10	Ot 2	20	5	4
Total Marks	10	10	10	10	20	60	



Fall-2023

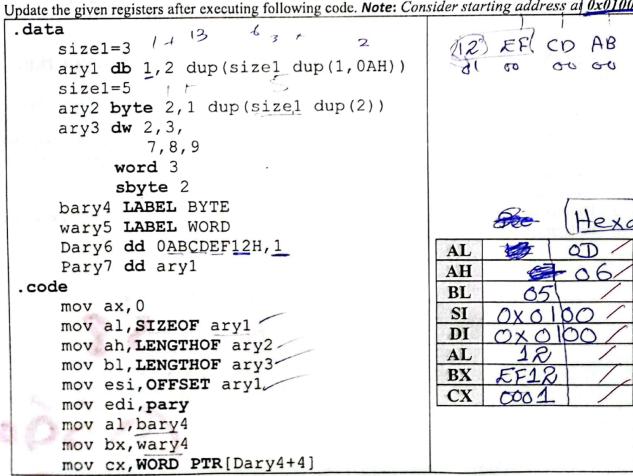
FAST School of Computing Question 1 [10 Marks]

Consider the following data declaration and fill in the given memory in hexadecimal (h).

Note: ASCII for 'A' = 041	H
.data quard doubleword	Qword 'ABCD', OABCDABCDH dd 'ABC', 01234ABCDH
mybyte byte2	db "AB", 0ABh, 23q, 17t, 1000101b sbyte -1, 255, 'A' +2*4 (99)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	OD	UE	UF
0100	44	43	48	41	00	8	00	00	CD	AB	CO	AB	00	00	80	00
0110	43	42	41	00	CD	AB	34	12	42	41	44	43	CD	AB	45	42
0120															nagen. I	
0130	AB	10		7.		1						1,7	5)			A.
0130		,										· ·				

Question 2 [10 Marks] Update the given registers after executing following code. Note: Consider starting address at 0x0100



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Fall-2023

Islamabad Campus

Question 3 [10 Marks]

Implement following C++ code using LOOP statement. Update the final value of SI after execution of the program.

```
int si=0;
for(int al=3;al>=0;al--)
{
    for(int bl=2;bl>=0;bl--)
    {
        for(int ecx=1;ecx>=0;ecx--)
        {
            cout<<si++;
        }
    }
}</pre>
SI= 24 \( \sigma \)
```

mov-si, 0

mov ecx, 3 4

first loop:

mov ex, 3

secondloop:

mov eax, ecx

mov ecx, 2

thirdloop:

inc si

Loop third toop

mov ecx, eax

loop secondloop

mov ecx, ebx

Loop firstloop.

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Question 4 [8+2 Marks]

Consider the following data declaration. Copy String to Stringcopy using LOOP.

.data string db "Encircle your cours	se instructor name to scor	e.
the bonus" size1=\$-string stringcopy dw sl dup("?")		
The first state of the state of		

1. 1. 1.
mov odi, offset string mov esi, offset stringcopy
mov esis affect stringcopy
mor ecx, size1
Losoops
most esite
mov eax), [edi] NAO
5007
inc ede
add esig TYPE stringcopy
and esta IVN sampcopy
Loop looop
Pero A of 6
Page 4 of 6

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Fall-2023

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Question 5 [20 Marks]

Update the given flags after executing the following code? No marks for direct answer perform i. operation in rough work.

mov ax, OFA12H add ax, CSEEH						
	OF	SIGN	ZF	AF	PF	CF
	0	0	1	1	1	1
ROUGH WORK: FAIZ	\rightarrow	0000 010	1111		<u>.</u>	~
		000000	00000	0000	9	

Write a code that add v1 with v2 and store result in sum. Your code should be for X86 architecture. ii.

.data	1717/1/1/(111011)
v1 sbyte -5 v2 dw 0FABCh	
sum dw 0	
.code	
mov ax,0	
mov ax, OFFFF	•
moval, VI	
add ax, vz	
mov som, ax	-

Page 5 of 6

FAST School of Computing Fall-2023 Islamabad Campus

iii. Write a code that swap content of v1 with v2.

data

v1 db 5

v2 db 4

.code

mov ax, 0

mov al, V1

Xchg al, V1

Xchg al, V1

iv. Consider the following data declaration and fill in the given memory in hexadecimal (h).

.data v1 **db** 1 align WORD v2 word 12EFH v3 byte 3 align DWORD v4 **db** 4 align 2 v5 dw OABCDH OC OD OE 0A 0B OF 05 06 07 08 09 02 03 04 00 01 04 CD 03 00 00 00 20 00 0100 0130