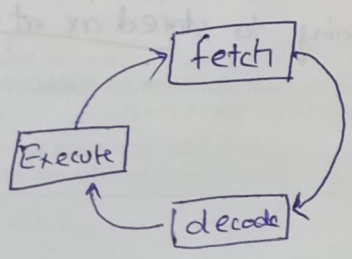
NATIONAL UNIVERSITY
OF COMPUTER & EMERGING SCIENCES
PESHAWAR CAMPUS

Name:	Umair Azad	Roll No:	19P-0030
Section:	3A	Examination:	Sessional - I
Semester:	Fall 2020	Total marks: 17	Weight: ×
Time allowed:	60 mins	Date:	October, 2020
Course:	EE213 - COAL	Instructor:	Dr. Nauman

Q. No.:	1	2	3	4	5	6	7	8	Sum	Sign
Scored:	1.5	0.5	0	1	0	0	0	1	4	
Total:	2	1	1	4	3	4	2	1		

- Attempt all questions on the question sheet.
- Answer the questions as concisely as possible. Please keep your text within the provided space.
- Think about the question before answering. You have a lot of time to solve the paper but every question would require time to see what the examiner wants. Do not rush.
- For the bonus question, if you don't know the answer, you can just write *no*.

1. What is the fetch-decode-execute cycle? Which components of a computing system are involved in carrying out this cycle?



In fetch-decode-execute cycle CPU, RAM, Rigesters, busses are involved in carrying out this cycle.

Score: 1.5 / 2

2. If both the cmp and sub instruction perform a subtraction, what is the difference between them?

Score 0.5 / 1

Both cmp and sub instruction perform a subtraction but sub instruction store data and cmp instruction compare data.

3. If you put a jne instruction in your code, some debuggers will display that as a jnz instruction. Why does this happen?

Because jne instruction need some data or address to jump if we do not provide anything than it is equal to zero.

Score 0 / 1

4. Identify if the following code fragment will lead to an error.

```
data:   dw  25, 20, 0

code:
        xor bx, bx
        mov ax, [data]
        mov bl, [data+1]
        add ax, bx
        mov [data + 6], ax
```

Yes, this code lead to an error because we defined data in double word and we use bl in the code. and data limit is upto 3 values but in this code we are going to stored ax at 6th.

Score 1 / 4

5. We have a number stored in the ax register. We want to figure out whether the most significant bit of this value is a 1. If it is, we need to write the value 100 in the memory address pointed to by the label `result`.

Write code for this requirement.

```
org [0x100]
mov ax, 1
mov dx, 04c00
int 0x21
```

Score 0 / 3

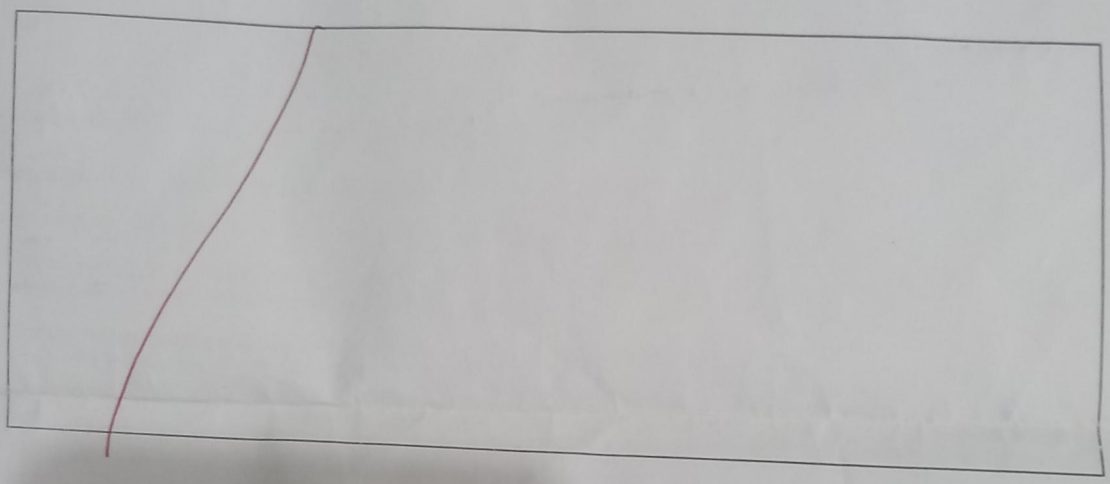
6. Take a look at the following piece of code:

```
first:    db  5
second:   db  2
highest:  db -100

start:
          xor ax, ax
          ...
```

Assume that we can change the two numbers to any value we like between -200 and +200.

Continue the given code to find the maximum of the two numbers. Place this maximum value in the data address pointed to by `highest`.



Score

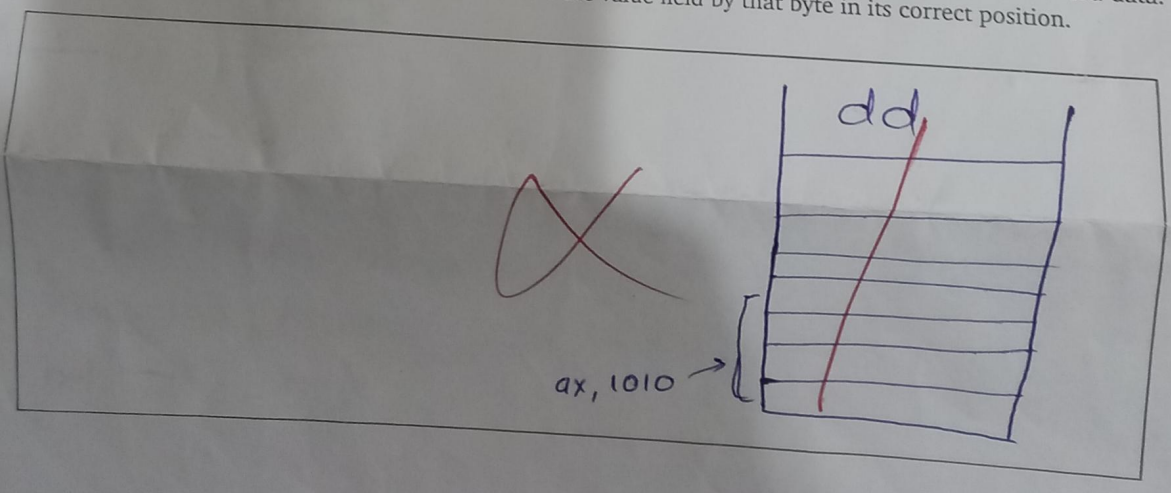
0 / 4

7. Consider the following piece of code:

```
num1:   dd 0x08040201
```

As you can see, we are using dd here, which we have not studied in class yet. However, you can use the concepts you have already learned to comprehend this. This construct is used to allocate a *double word* i.e. 4 bytes in the memory.

Assume that num1 is at address 0x1010. You need to draw the portion of RAM that holds this double word data. Make sure you label each address byte clearly and write the value held by that byte in its correct position.



Score

0 / 2

8. *Bonus question:* If we want to deploy code compiled using a 32-bit machine on a 16-bit machine, we need a dedicated piece of software. Do you know what that software is called?

NO

Score

1 /