

[UJT]

CSE 341: Microprocessors

Department of Computer Science and Engineering

Brac University

**Examination: Quiz 1**

**Semester: Fall 2025**

**Duration: 25 Minutes**

**Full Marks: 15**

Name:

ID:

Section:

**Answer all the questions.**

1. Suppose the stack part of your memory is empty initially. Then 20678 bytes of data are pushed in the stack of the memory, respectively. There are a few registers: **AX = 1000h, BX = 2000h, CX = 3090h, DS = 4080h, ES = 1100h, SS = 3020h, IP = 1234h, DI = 7856h**. Now you want to access the second data which was pushed at the second last physical address of the stack. Find out the second last physical address of the stack and the value of **BP**. [2]

2. Draw the internal architecture of BIU. [2]

3. Write down 2 differences between ROM and RAM. [1]

4. Write down the major components of a microprocessor. [2]

5. Suppose you have microprocessor X with a memory of **8 GB** in size each. The size of the address bus and data bus is 32 bits and 25 bits, respectively. In each memory location, two bytes of data can be stored. The memory locations are calculated using the same formula as the 8086 microprocessor.

- a) Deduce how many numbers of segments there are in the memory.[2]
- b) What will be the last physical address of the memory for this processor? [1]
- c) Deduce the size of each segment **in MB** of this memory. [4]
- d) Write down the logical address of the 4th last address of the memory in the scenario, given that it is a part of a non-overlapping segment. [1]

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**Answer all the questions.**

1. Suppose the stack part of your memory is empty initially. Then 10752 bytes of data are pushed in the stack addresses of the memory, respectively. There are a few registers: **AX = 1000h, BX = 2000h, CX = 3090h, DS = 4080h, ES = 1100h, SS = 5170h, IP = 1234h, DI = 7856h.** Now you want to access the second data which was pushed at the second last physical address of the stack. Find out the second last physical address of the stack and the value of **BP.** [2]

2. Draw the internal architecture of EU [2]

3. Write down 2 differences between  $\mu p$  and  $\mu c$ . [1]

4. Write down the major components of a microprocessor. [2]

5. Suppose you have microprocessor X with a memory of **4 GB** in size each. The size of the address bus and data bus is 32 bits and 24 bits respectively. In each memory location 1 byte data can be placed. The memory locations are calculated using the same formula as the 8086 microprocessor.

- a) Deduce how many numbers of segments there are in the memory. [2]
- b) What will be the last physical address of the memory for this processor? [1]
- c) Deduce the size of each segment **in MB** of this memory. [4]
- d) Write down the logical address of the 3rd last physical address of the memory in the scenario, given that it is a part of a non-overlapping segment. [1]