COMSATS UNIVERSITY ISLAMABAD, Lahore Campus

Department of Computer Engineering

Subject: Microprocessor Systems and Interfacing (3+1)	**Course Code: CPE342**
Exam: Mid-Term (Theory)	**Total Marks: 50**
Time Allowed: 90 minutes	**Date:**
Student's Name:	
Registration Number:	**Section: FA22-BCE-A,B**

Instructions:

- This is a closed-book closed-notes exam
- The CPU referred here is Intel 8086-88
- Provide your solutions on answer book only
- Sharing of calculator is strictly prohibited
- Keeping cell phones with you, either in on or off condition, is not allowed

Question 1 (CLO1-C3-PLO1) **20 Marks**

Consider an 8088-based data logging system that receives data of a sensor. Following table shows the acquired data which are stored in the RAM at the given addresses.

Address	Data
ABCDH:1000H	36
ABCDH:1001H	247
ABCDH:1002H	12
ABCDH:1003H	96
ABCDH:1004H	78
ABCDH:1005H	197
ABCDH:1006H	57
ABCDH:1007H	119
ABCDH:1008H	255
ABCDH:1009H	201

Applying your understanding about 8086-88 assembly language programming, produce the hexadecimal contents of `AX, BX, CX, DX,` and `SI` after execution of each instruction from line 13 to 16.

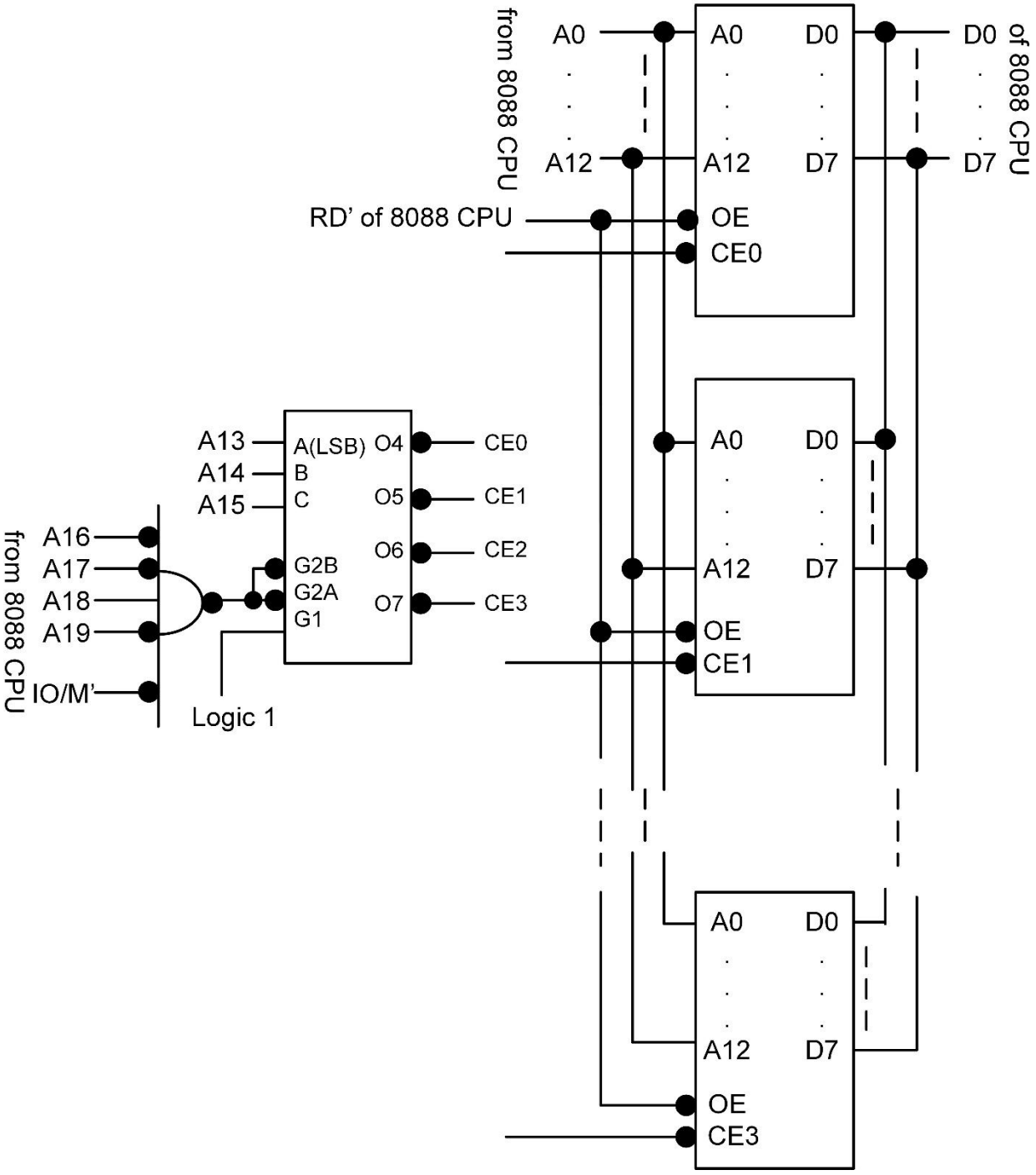
```
1.      MOV   AX, 0ABCDH
2.      MOV   DS, AX
3.      MOV   CX, 10
4.      MOV   SI, 1000H   ;Starting memory location
5.      XOR   BX, BX
6.      XOR   DX, DX
7.      MOV   AX, 0
```

```
8.      L1:
9.      MOV   AL, [SI]
10.     ADD   BX, AX
11.     INC   SI
12.     LOOP  L1
13.     MOV   AX, BX
14.     MOV   CX,10
15.     DIV   CX
16.     MOV   BX, AX
```

Present your solution in the form of a table as shown below.

Instruction No.	AX	BX	CX	DX	SI
13	512H	512H	0H	0H	100AH
14	512H	512H	000AH	0H	100AH
15	0081H	512H	000AH	0008H	100AH
16	0081H	0081H	000AH	0008H	100AH

Question 2 (CLO2-C5-PLO3) **15 = 10+5 Marks**



Memory Map:

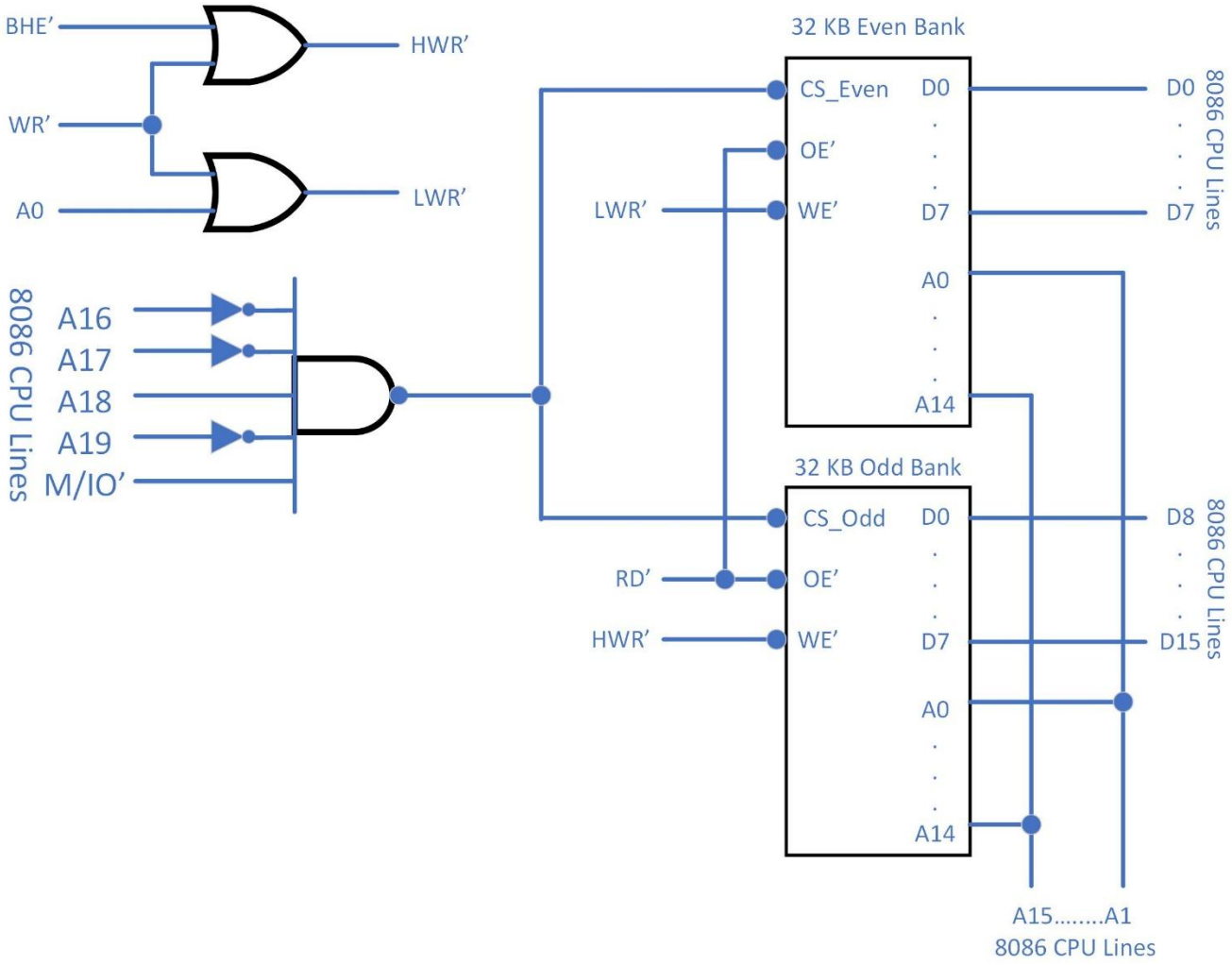
Chip 0: A8000H to A9FFFH

Chip 1: AA000H to ABFFFH

Chip 2: AC000H to ADFFFH

Chip 3: AE000H to AFFFFH

Question 3 (CLO2-C5-PLO3) **15 = 10+5 Marks**



Memory Map:

Even Addresses SRAM: 40000H, 40002H, … , 4FFFEH

Odd Addresses SRAM: 40001H, 40003H, … , 4FFFFH