Department of Computer Science and Engineering
Midterm Examination: Fall 2017

CSE341: Microprocessors

Total Marks: 30 **Time Allowed: 1 Hour 15 Minutes**

- Answer ALL **Three (3)** questions.
- Figure in bracket [] next to each question indicates marks for that question.

1. (a) Define the term Microprocessors. Justify the following statement with examples: Microprocessors deal with the controlling and data processing of high end applications. [5]

   (b) A microprocessor has a 16-bit address line, where each address contains 8 bits. An SRAM device is connected to the microprocessor. The microprocessor has assigned the addresses 0xD800 to 0xDFFF to this SRAM. [5]

   (i). What is the size (in KB, or MB) of this SRAM?

   (ii). What is the minimum number of bits required to represent the addresses only for this SRAM?

2. (a) Define the following term: addressing mode of an instruction. How do you relate the terms addressing modes with types of operands? [2]

   (b) Identify the operand addressing mode used in each of these instructions. [5]

```
i.   MOV [BX],AX;
ii.  MOV Array[AX], BX;
iii. ADD DX,15;
iv.  MOV [BX+DI],CX;
v.   MOV [DI+4],DH;
```

   (c) What is the difference between the following jump instructions: JNS, JS, and JO? Explain them with examples. [3]

3. (a) Complete the following table. The numbers are represented with 8 bits. [2]

Decimal	Representation 1's Complement	2's Complement

(b) What will be the values of the specified registers and flags after the execution of the following instructions? 5

i.
```
MOV CX, 0604H
MOV AX, 0A98H
SHL AH, CL
ADD CX, AX
```

AX=?, CX=?, CF=?, PF=?, AF=?, SF=?, ZF=?

ii.
```
MOV AX, 8F0AH
MUL AL
SUB AH, AL
ADD AX, AX
```

AX=?, CF=?, PF=?, AF=?, SF=?, ZF=?

(c) Perform the following operations using the 2's complement representation with 8 bits. Determine whether the operations result in an overflow. 3

(a) -59-114, (b) -86+114

Good Luck