SIR SYED UNIVERSITY OF ENGINEERING & TECHNOLOGY
COMPUTER SCIENCE & INFORMATION TECHNOLOGY DEPARTMENT

SPRING 2021

MICROPROCESSOR & ASSEMBLY LANGUAGE (CS-330)

ASSIGNMENT # 01

Semester: 5th — Batch: 2019
Due Date: 17th March, 2021 — Max Marks: 10

Instruction:

- Attempt all questions in a sequence.

1- Answer the following questions:
   (a) How many nibbles are 16 bits?
   (b) How many bytes are 32 bits?
   (c) If a word is defined as 16 bits, how many words is a 64-bit data item?
   (d) If a computer has a 32-bit data bus. What is the largest number that can be carried into the CPU at a time?
   (e) Regarding address bus, data bus and control bus, which is unidirectional and which is bidirectional?
   (f) Which section of CPU is responsible for performing addition?

2- Add the following hex values.
   (a) 2CH + 3FH
   (b) F34H + 5D6H
   (c) 20000H + 12FFH
   (d) FFFFH + 2222H

3- Subtract the following hex values.
   (a) 24FH – 129H
   (b) FE9H – 5CCH
   (c) 2FFFFH – FFFFFH
   (d) 9FF25 – 4DD99H

4- Which of the following instructions cannot be coded in 8086 Assembly language? Give reason why not, if any.
   (a) MOV AX, 27
   (b) MOV AL, 97F

(c) MOV DS, 9BF2
(d) MOV CX, 397
(e) MOV SI, 9516
(f) MOV CS, 3490
(g) MOV DS, BX
(h) MOV BX, CS
(i) MOV CH, AX
(j) MOV AX, 23FB9
(k) MOV CS, BH
(l) MOV AX, DL

5- If CS = 3499H and IP = 2500H, find:
(a) The logical address
(b) The physical address
(c) The lower and upper ranges of code segment

6- If DS = 1298H and offset is 3FB9H, find:
(a) The physical address
(b) The logical address of the data being fetched
(c) The lower and upper range addresses of the data segment

7- If an instruction that needs to be fetched is in physical memory location 389F2H and CS = 2700H, does the code segment range include it or not? If not, what value should be assigned to CS if the IP must equal 1282?

8- If SS = 2000H and SP = 4578H, find:
(a) The physical address
(b) The logical address
(c) The lower range of stack segment
(d) The upper range of stack segment

9- The following registers are used as offsets. Assuming that the default segment is used to get the logical address, give the segment register associated with each offset.
(a) BP
(b) DI
(c) SI
(d) IP
(e) SP
(f) BX

10- Find the status of all conditional flags for the following operations:

(a) MOV AH, 9FH
    ADD AH, 61H
(b) MOV BL, 23H
    ADD BL, 97H
(c) MOV DX, 10FFH
    ADD DX,1

11- Assume that the registers have the following values (all in hex) and that CS = 1000, DS = 2000, SS = 3000, SI = 4000, DI = 5000, BX = 6080, BP = 7000, AX = 25FF, CX = 8791 and DX = 1299. Calculate the physical address of the memory where the operand is stored and the contents of the memory locations in each of the following addressing examples:

(a) MOV [SI], AL
(b) MOV [SI+BX+8], AH
(c) MOV [BX], AX
(d) MOV [DI+6], BX
(e) MOV [3600], AX
(f) MOV [BP]+200, AX

12- Give the addressing mode for each of the following commands:

(a) MOV AX, DS
(b) MOV CX, [3000]
(c) MOV [BP]+6, AL
(d) MOV BX, 5678H
(e) MOV AL, [BX]
(f) MOV [DI], BX
(g) MOV DX, [BX][DI]+200
(h) MOV [2348], DX
(i) MOV [BX+SI+50], AH
(j) MOV [SI+60], AL