

# Sp 23 - Fall 21

- ✓ 1. Define Functions and elements of BIU & EU and Draw block Diagram of 8086?
- ✓ 2. What is Pipelining, and how does it work,? How does it speed up a processor? what are the benefits and disadvantages / Drawback Explain it according to 8086
- ✓ 3. Why A microprocessor is called the “Brain of a Computer”? We are habituated with which Processor Family
- ✓ 4. Write a Assembly Program to find The area Of SQUARE

a. Write an assembly code to do the following actions:

- i. Input a number character and convert into digit
- ii. Display a prompt message “Good Luck!!!”
- iii. Display First letter of your Name
- iv. Find out the 2's complement of DL
- v. Subtract two values without using the SUB instruction

Find out the status of flags (CF, SF, ZF, PF, AF, OF) after the execution of the following instructions: [5]

- i. INC AL
- ii. NEG AL
- iii. XCHG AL, BL
- iv. ADD AL, BL
- v. AND AL, 01H

✓ 5. [Consider AL= Last two digits of your registration number in Hex form and BL= 0FH]

7. Explain The function of AX & DX during Mul , Div , add,sub and flags

8. Mention the advantages of a microprocessor, list the feature that you think can be used to evaluate the performance of a Microprocessor

a. Define Segmentation. What are the benefits of segmentation? If total memory is 1MB, then how many segments possible of 64KB in size?

b. 8086 has 16-bit data bus (D0- D15) but the memory is organized in byte form (D0-D7) of 1MB. How does 16-bit data bus is utilized using 8-bit memory structure? Explain from memory bank concept with proper diagram.

9.

10. Mention the addressing mod and physical address from below  
i) MOV AX,BX

ii. ADD AX, [BX]

iii. JMP L

iv. NOP

→ MOV AX, A[BX][SI]

Where, CS= 2344H, DS [last four digits of your ID in Hex], SS= 9887H, ES= 8787H,  
BX=0098H, SI= 0066H, L= 09h

What are the differences between SHL and SAL? Explain with appropriate examples. If DL = First two digits of your registration number in Hex (if required convert it into Binary), then find out the final value of DL after execution of the followings

- i. ROL DL, 1
- ii. SAR DL, 1
- iii. MOV CL, 2  
RCR DL, CL

11.

a. Write an assembly code to do the following actions:

- i. Input a character
- ii. Display a prompt message "Have a Good Day!!!"
- iii. Display First letter of your Name
- iv. Find out the 2's complement of AL
- v. Input a digit from keyboard and convert it into decimal

b. What are the status of flags (CF, SF, AF, ZF, PF, OF) that will be affected for the following instructions:

- i. ADD/SUB
- ii. OR/AND
- iii. SHL/SHR
- iv. MOV/XCHG
- v. INC/DEC

12.

Why Main procedure needs no Return statement? Explain the application of stack during calling a procedure (e.g., CALL NAME) and returning to main procedure (e.g. RET), use appropriate diagram and SP.

13.

b. Write the logic instructions with appropriate mask bit pattern to do the followings for BL:

- i. Clear Bit 1,5,7
- ii. Set Bit 0, 4, 6
- iii. Complement Bit 1, 3, 5
- iv. Complement BL
- ✓ TEST LSB of BL is 1? 00000001

OR

a. Write an assembly program to Input two integer values from console (Byte form) X, C where

$0 < X \leq 9$ , and  $C = 0$  or  $1$ .

- i. If  $C=1$  then find out X is even number or not.
- ii. If  $C=0$  then find X is odd number or not.

b. Write an assembly program to count the number of characters until "New Line" character is pressed.

14.

a. Write a program to Input three integer values (Byte form) X, Y, C from user where  $0 > X \leq 9$ ,  $0 > Y \leq 9$ , and  $C = 0$  or  $1$ .

- i. If  $C=0$  then compute  $X*Y$
- ii. If  $C = 1$  then compute  $X/Y$

b. Write an assembly program to find out the sum of the odd numbers up to N terms.  
e.g.  $1+3+5+7+\dots$

15.

a. Write an assembly program to input an alphabet and convert it into its opposite case. Except alphabet if any other key is pressed then it will display the string "INVALID INPUT".

b. Write an assembly program to count the numbers of characters in an input line until a carriage return is pressed.

16.

- a. Find out the addressing modes of the operands present in the following instructions (Both Source and Destination) and calculate the physical address of the memory operands only:

- i. CMP AL, [BX]
- ii. SUB AX, DX
- iii. MOV AX, A[SI]
- iv. MOV AX, [DI]
- v. CALL SUM
- vi. HLT
- vii. IN AX, DX
- viii. MOV AL, A[BX][SI]

where, SS=0123h, DS=0124h, ES=0987h, CS=0678h, IP=0956h, SI= 0456h  
DI= 0378h, BX=0567h, A=09h, SUM=0089H.

- b. Write a short note on relative addressing mode. Differentiate intra segment and inter segment addressing modes.

17.

3. a. What will be the value of SP after executing following instructions? Explain using diagrams.
- i. . STACK 100H
  - ii. PUSH AX
  - iii. POP AX
  - iv. PUSHF
  - v. RET
- b. Write a procedure to add two numbers. What is usage of stack during a procedure call.
4. a. Take three integer values x,y,z from user , where  $0 \leq x,y \leq 4$ ,  $x > y$ , and  $z = 0$  or  $1$ .  
If  $z=0$  print  $x*y$  (MUL X,Y) and if  $z = 1$  print  $x/y$  (DIV X,Y ) in the console.
- b. Take an input n & calculate the sum of the series up to 10th term. The series is  $10+ 9 + 8 + 7 + 6+ 5 + 4 + 3 + 2 + 1$

18.



5. a. Write the logic instructions to do the followings

- i. Clear LSB of AL
- ii. Set MSB of AL
- iii. Complement AL
- iv. Toggle bit 4 of AL
- v. TEST MSB of AL is 1/0

b. Find out the output of the following instructions:

- i. ROL AL,1
- ii. RCL AL,1
- iii. SAL AL, 1
- iv. MOV CL,2  
SHR AL, CL
- v. SAR AL, 1

[Consider initial value of AL is Last two digits of your ID]

19.

- a. Input three integer values x,y,C from user where  $0 \leq x,y \leq 9$ , and  $C = 0$  or  $1$ .  
If  $C=0$  print the minimum of x,y and if  $C = 1$  print the maximum of x,y
- b. Write an assembly program to find out the sum of the odd numbers up to N terms.  
e.g.  $1+3+5+7+\dots$

20.

5. a. If AL=FFH. Write the logic instructions with appropriate mask bit pattern to do the followings:

- i. Clear Bit 0, 2, 5 of AL
- ii. Set Bit 1, 3, 7 of AL
- iii. Complement Bit 2, 4, 6 of AL
- iv. Complement AL
- v. TEST MSB of AL is 0?

b. What are the differences between SHR and SAR? Explain with appropriate figures. If AL= 10010100B, then find out the final value of AL after execution of the followings

- i. ROR AL, 1
- ii. SHR AL, 1
- iii. SAL AL, 1

21.

a. 'STACK operates in LIFO'- How? Explain using diagrams. What will be the value of SP after executing following instructions?

- i. . STACK 100H
- ii. PUSH AX [Initially SP= 0540H]
- iii. POP AX [Initially SP= 053EH]

b. What is the importance of Stack Segment while implementing procedure mechanism in 8086? What happens in the Stack segment when main procedure is calling another procedure or returning from a called procedure to main? Explain with examples using necessary diagrams.

22.

6.

a. What is the difference between following two instructions:

i. MOV AX, 1234H

ii. MOV AX, [1234H]

Mention the addressing modes of the above instructions.

b. Find out the addressing modes of the operands present in the following instructions (Both Source and Destination) and calculate the physical address of the memory operands only:

i. CMP AL, [BX]

ii. SUB AX, DX

iii. MOV AX, A[SI]

iv. MOVSB

v. RET

vi. HLT

vii. IN AX, DX

viii. MOV AL, A[BX][SI]

where, SS=0123h, DS=0124h, ES=0987h, CS=0678h, IP=0956h, SI= 0456h

DI= 0378h, BX=0567h, A=09h, RET=0089H.

23.