8086 Microprocessor Assembly language Programming

1. Arithmetic Programs: Write an ALP (assembly language program) to

 1.1 Store two 8-bit numbers in BL & DL. ADD them and save the result in CL.
 1.2 Store two 16-bit numbers in AX & BX. ADD them and save the result in AX.
 1.3 Store two 8-bit numbers in CL & DL. Subtract DL from CL save the result in CL.
 1.4 Store two 16-bit numbers in BX & CX. Subtract CX from BX save the result in AX.
 1.5 Store two 8-bit numbers in AL & CL. Multiply AL and CL save the result in AX.
 1.6 Store two 16-bit numbers in AX & BX. Multiply AX and BX save the result in CX and DX.
 1.7 Store two 8-bit numbers in AL & BL. Divide AL and BL save the result in registers of your choice.
 1.8 Store two 16-bit numbers in AX & BX. Divide AX and BX save the result in registers of your choice.

2. Write an ALP to form a square of each element of the given byte array
 Input: Memory location   Data
    1000   :   01H
    1001   :   03H
    1002   :   05H
    1003   :   02H
    1004 `  ;` 06H
    1005   :   08H
    1006   :   07H

3. Write an ALP to find the number of one's in a word stored in consecutive memory locations.
 Input: Memory location   Data
    1000   :   23H
    1001   :   12H
 Output: Memory location   Data
    2000   :   05H

4. Write an ALP to find the mean square of a data stored in successive memory locations.
 Input: Memory location   Data
    1000   :   01H
    1001   :   02H
    1002   :   03H
    1003   :   04H

5. Write an ALP to output Fibonacci series upto 15 terms.

6. Write an ALP to arrange the given elements of the array in ascending and descending order.

7. write an ALP to find the nature of the roots of the quadratic equation whose coefficients are stored in successive memory locations and output is

Output:
2000: 00 if the roots are real and equal
          01 if the roots are real and distinct
          02 if the roots are imaginary

8. Write an ALP to count the number of elements in a word array with the end of the array marked by 0000H

9. Write an ALP to find the largest element and lowest element of the given byte array.

10. Write an ALP to convert the given Fahrenheit temperature to Celsius temperature
       Hint: F=C*9/5+32 or C=(F-32)*5/9

11. Write an ALP to find out the product and addition of two 3X3 matrices when the elements are stored in successive memory location row-wise.

12. Write an ALP to add two ASCII numbers and also add two BCD numbers.

13. Write an ALP to convert a hexadecimal to decimal number

14. Write an ALP to find the no occurrence of an element in a byte array

15. Write an ALP using the loop instructions with indirect addressing that copies a string from source to target reversing the character order in the process.
       Input: "This is the string"
      Output: "gnirts eht si siht"

16. Write the GCD of two 8-bit numbers.
       Input: 1000: 12H
                 1001:0CH
       Output: 2000:06H

17. A company makes several parts. Each part is coded below. The code is 16-bit width with 4-bits for part number and 8-bits for serial number. Find the total number of items with part number=4

Model No.	Part No,	Serial No.
4-bit	4-bit	8-bit