2016

M.Sc.

3rd Semester Examination

ELECTRONICS

PAPER—ELC-305 (Set-I)

(Practical)

Full Marks : 50

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(Microprocessor Programming)

Answer any *one* question, selecting it by a lucky draw.

1. Two 16-bit number N_1 and N_2 are stored from the memory location X000H and Y000H respectively. Write an assembly language program to find $(N_1 - N_2 - 2) \times 2$ with using DSUB. Store the result in two consecutive memory locations. Repeat the experiment with 3 different sets of data.

2. Write an assembly language program to compute :

$$S = 3N_1 + 5N_2 + 7N_3$$

where N_1, N_2 and N_3 are three 8-bit numbers available from three consecutive memory locations. Store the sum S in another memory location. Perform the experiment for 3 different sets of N_1, N_2 and N_3 values.

3. Four bytes N_1, N_2, N_3 and N_4 are stored from a memory location with address X500H onwards. The decimal value of each of the byte does not exceed 15. Write an assembly language program to compute : $R = N_1 \times N_3 - N_2 \times N_4$, and store the result R in another memory location. Use the repeated addition method for multiplication as subroutine. Perform the experiment for 3 different values of N_1, N_2, N_3 and N_4.

4. Two 8-bit numbers are stored in two consecutive memory locations. Write an assembly language program to :

   (i) store the numbers in BC register pairs.

   (ii) add the numbers.

   (iii) store the contents of accumulator and flag registers in HL register pairs.

   (iv) exchange the data in the BC and HL register pairs.

   Repeat the experiment for 3 different sets of 8-bit numbers.

5. Write an assembly language program to count number of 1 and 0 bits in a byte stored in D register. Store number of 1 in H register and that of 0 in L register.

   Repeat the process with 5 different data.

6. Write an assembly language program to calculate the square root of a given real number. Store the number and FFH in consecutive memory locations if the number is a perfect square ; otherwise an error message FEH. Keep the result of the perfect square number in another memory location.

   Repeat the experiment with 5 different data.

7. Write an assembly language program to calculate factorial of a whole number. Store the number and its result in consecutive memory locations. Find out the values for the number 0 and four other numbers 1, 3, 5 and 7.

8. Write an assembly language program to arrange 8 bytes of data in an ascending order. The data are stored in memory locations starting from X050H. Store the result from the memory location X500H onwards. Store the largest and smallest numbers in consecutive memory locations.

   Repeat the experiment with three different arrays of data.

9. A set of ten 2-digit BCD readings is stored in the memory locations starting from X500H. Write an assembly language program to convert the numbers into binary and add the numbers. Store the sum in the memory location X700H onwards ; the sum can be larger than FFH.

Repeat the experiment with three sets of readings.

10. A set of ten bytes is stored in memory locations starting with an address XX50H. Write an assembly language program to save the bytes that are higher than 60_{10} and lower than 100_{10} in memory locations XX60H onwards. Store the sum of the selected numbers in memory locations X700H onwards ; the sum can be larger than FFH.

Repeat the experiment with three sets of data.

Distribution of Marks

Flow chart	: 05 Marks
Assembly language program	: 10 Marks
Execution of the program	: 10 Marks
Result	: 05 Marks
Discussion	: 05 Marks
Viva voce	: 10 Marks
Laboratory note book	: 05 Marks
Total	: 50 Marks