2016

M.Sc. 3rd Seme. Examination

ELECTRONICS

PAPER—ELC-305 (Set-II)

(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. A set of ten bytes readings is stored in memory locations starting at XX60H. The readings are expected to be positive. Write an assembly language program to :

(a) check each reading to determine whether it is positive or negative.

(b) reject all negative readings.

(c) add all positive readings.

(d) store FFH in the memory location XX70H when the sum exceeds eight bits, otherwise, store the sum.

Repeat the experiment with three different sets of readings.

2. 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) subtract the content of register C from that of register B.

   (iii) store the result and flag content in DE register pairs.

   (iv) exchange the data bytes in the registers B and E and also that of the C and D.

   Repeat the experiment for 3 different sets of numbers.

3. A set of ten bytes is stored in memory locations starting at XXOOH. Write an assembly language program to :

   (a) count the number of positive numbers and store it with the positive numbers at memory locations starting at XX50H.

   (b) count the number of zeros in the data set and store it in the memory location XX60H.

   (c) count the number of negative numbers and store it with the negative numbers at memory locations starting at XX70H.

   Repeat the experiment for 3 different sets of data.

4. Write an assembly language program to find whether an 8-bit number stored in a memory location XX50H is a prime number or not. If the given number is a prime number, show 01H in the memory location XX50H ; otherwise, display OOH therein.

   Repeat the experiment with 5 different numbers.

5. Write an assembly language program to arrange 10 bytes of data in a descending order. The data are stored in memory locations starting from X050H. Store the result from the memory locations X500H onwards. Store the smallest and largest numbers in the consecutive memory locations XX70H and XX71H respectively.

   Repeat the experiment with three different arrays of data.

6. Write an assembly language program to convert ten byte Gray codes into binary and add the numbers. The Gray codes are available from the memory locations starting from XX50H. Store the binary numbers into memory locations starting from XX70H and the result of addition in the memory location XX80H.

   Repeat the experiment with three sets of data.

7. Two 16-bit numbers P and Q are stored from the memory locations XOOOH and YOOOH respectively. Write an assembly language program to find $(P - Q - 2) \times 2$ without using DSUB. Store the result in two consecutive memory locations.

   Repeat the experiment with 3 different sets of data.

8. Write an assembly language program to multiply two 8-bit numbers (P and Q) using left-shift and add method. Also find $X = P \times Q - R$, where P, Q and R are all 8-bit numbers and stored in memory locations starting from XX60H. Store the results of the product $P \times Q$ and X in the consecutive memory locations starting at XX70H.

9. Write an assembly language program to calculate the square of a given number ($<16_{10}$) using the following algorithm :

Step 1 : Square ← 0, Count ← given number, Odd ← 1
Step 2 : Square ← Square + Odd
Step 3 : Count ← Count – 1
Step 4 : If Count = 0, then go to Step 6
Step 5 : Odd ← Odd + 2, go to Step 2
Step 6 : Store the current value of square.

The number is available at memory location XX50H and store the result at memory location XX51H.

Repeat the operations for 5 numbers.

10. Write an assembly language program to calculate factorial of a whole number. Store the number and its result in consecutive memory locations.

Data : 00H, 01H, 02H, 04H and 07H.

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