2015

M.Sc.

3rd Semester Examination

ELECTRONICS

PAPER—ELC-305 (Set-1)

(PRACTICAL)

Full Marks : 50

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

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

(*Microprocessor Programming*)

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

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

   STEP I : Square ← 0, Count ← given number, Odd ← 1
   STEP II : Square ← Square + Odd
   STEP III : Count ← Count − 1
   STEP IV : If Count = 0, then go to STEP VI
   STEP V : Odd ← Odd + 2, go to STEP II
   STEP VI : Store the current value of square.

   The number to be squared is available from a memory location XX50H and store the result in a memory location XX60H. Repeat this operation for 5 numbers.

2. Write an assembly language program to find 2's complement of an 8-bit number using the following algorithm :

   "Copy all the bits starting from the LSB of the byte upto the first 1 bit of the number and then complement all the bits up to MSB". Repeat this experiment for 5 numbers.

3. The memory locations XX50H and XX51H contain two numbers X and Y. Write an assembly language program to divide X by Y (without using repeated subtraction). Store the quotient and remainder in the locations XX80H and XX81H respectively. Repeat the experiment with 5 sets of data.

4. A set of ten current readings is stored in memory locations starting at XX50H. The readings are expected to be positive ($<127_{10}$). Write an assembly language program to :

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

   (b) reject all negative readings.

   (c) add all positive readings.

   (d) in the memory location XX60H, store FFH when the sum exceeds eight bits ; Otherwise, store the sum :

   Date (H) : 21, C2, 2F, 24, 28, 9F, F2, 30, D8, 19

   Repeat the experiment with two more different data sets of ten bytes each.

5. Write an assembly language program to transfer the bytes from a block of 16 bytes stored from X050H to X05FH, following the condition stated below :

   "The transferred bytes should have the upper nibble double of the lower nibble. The starting address of the destination should be X300H. Repeat this process for 3 different block of bytes.

6. Write an assembly language program to convert a 8-bit Gray code into its equivalent binary number. In the memory location X200H the Gray code is stored. The result is to be kept in the memory address X300H. Repeat the experiment with 5 different Gray codes.

7. A set of ten bytes are stored in memory locations starting with the address XX50H. Write an assembly language program to :

   (i) check each byte, and save the bytes that are higher than 60_{10} and lower than 100_{10} in the memory locations starting from XX60H.

   (ii) Find the largest number within the sorted numbers and save the result in the memory address XX70H.

   Repeat the experiment with 2 different sets of data.

8. Write an assembly language program to find whether an 8-bit number stored in the memory address XX50H is a prime number or not. If the given number is a prime number, show 01H in the memory location XX80H; otherwise, display 00H therein. Repeat the experiment with 5 different numbers.

9. Write an assembly language program to convert a BCD number between 0 and 99 stored in a memory location X500H into its equivalent binary number. Store the result in a memory location X700H. Repeat the experiment with 5 different numbers.

10. Write an assembly language program to find LCM of three single byte numbers stored in three consecutive memory locations starting from XX50H. Store the result in a memory address just after the data locations. Repeat the experiment for 5 different 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

2015

M.Sc.

3rd Semester Examination

ELECTRONICS

PAPER—ELC-305 (Set-2)

(PRACTICAL)

Full Marks : 50

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

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

(*Microprocessor Programming*)

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

1. Write an assembly language program to transfer the bytes from a block of 16 bytes stored from X050H to X05FH, following the condition stated below :

   "The byte should be even but the upper nibble of the byte should be odd. The starting address of the destination should be X300H." Repeat this process for 3 different block of bytes.

2. Write an assembly language program to find whether an 8-bit number stored in the memory location XX60H is a prime number or not. If the given number is a prime number, show 01H in the memory location XX90H; otherwise, display 00H therein. Repeat the experiment with 5 different numbers.

3. Write an assembly language program to find 2's complement of an 8-bit number using the following algorithm :

   "Copy all the bits starting from LSB of the byte upto the first 1 bit of the number and then complement all the bits up to MSB".

   Repeat the experiment for 5 numbers.

4. Write an assembly language program to convert an 8-bit binary number into its equivalent Gray code. The binary number is to be stored in the memory location X200H and the result is to be seen in the memory location X300H. Repeat the experiment with 5 different numbers.

5. The memory locations XX50H and XX51H contain two numbers X and Y. Write an assembly language program to divide X by Y (without using repeated subtraction). Store the quotient and remainder in the locations XX80H and XX81H respectively. Repeat the experiment with 5 sets of data.

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

   STEP I : Square ← 0, Count ← given number, Odd ← 1
   STEP II : Square ← Square + Odd
   STEP III : Count ← Count – 1
   STEP IV : If Count = 0, then go to STEP VI
   STEP V : Odd ← Odd + 2, go to STEP II
   STEP VI : Store the current value of square.

   The number to be squared is available from a memory location XX50H and store the result in a memory location XX60H. Repeat the operation for 5 numbers.

7. Write an assembly language program to convert an 8-bit binary number stored in a memory location X500H into its an equivalent BCD number. The memory locations starting from X700H are specified for the result. Repeat the experiment with 5 different numbers.

8. Write an assembly language program to find the HCF of three 8-bit numbers stored in three consecutive memory locations starting from XX50H. Store the result in a memory address just after the data locations. Repeat the experiment for 5 different sets of data.

9. A set of ten bytes are stored in memory locations starting with the address XX50H. Write an assembly language program to :

(i) check each byte and save the bytes that are higher than 60_{10} and lower than 100_{10} in memory locations starting from XX60H.

(b) Find the smallest number within the sorted numbers and save the result in the memory address XX70H. Repeat the experiment with 2 different sets of data.

10. A set of ten current readings is stored in memory locations starting at XX50H. The readings are expected to be positive ($<127_{10}$). Write an assembly language program to :

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

(ii) reject all negative readings.

(iii) add all positive readings.

(iv) store FFH in the memory location XX60H when the sum exceeds eight bits ; otherwise, store the sum :

Data (H) : 21, C2, 2F, 24, 28, 9F, F2, 30, D8, 19

Repeat the experiment with two more different data sets of ten bytes each.

Distribution of Marks

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