Q1 a) local x,s in square

______________________________
Local y, sum3 in sum
Nonlocal square in sum

______________________________
Local z,a,b,total in main
Nonlocal sum, square in main

b) Formal parameters 1) x in square , 2) y in sum
  Actual parameters 1) z,a,total,b in main , 2) sum3 in sum 3) s in square

c)
Q2 a)  

start

Initialize counter and sum to zero

Label : Read the value of number

    Increase the counter by one

    If number less than zero then
        Add sum to number
    Else
        If number greater than 50 then
            Print sum
        Else
            Goto label

End
Q3 a)

<table>
<thead>
<tr>
<th></th>
<th>10</th>
<th>Integer</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>0</td>
<td>Integer</td>
</tr>
<tr>
<td>q</td>
<td></td>
<td>Integer</td>
</tr>
<tr>
<td>z</td>
<td>0.0</td>
<td>Real</td>
</tr>
<tr>
<td>t</td>
<td>true</td>
<td>Truth value</td>
</tr>
</tbody>
</table>
Q4

**Steps in Computer Program Development**

A computer program was defined as a sequence of logical instructions that should be followed by a computer to solve some given problem. The steps in the development of each of the computer programs that make up the computer program component of a system are

1) Define the function of the program
2) Plan the logic of the program
3) Code the program
4) Test and debug the program
5) Complete the documentation.

1) Detailed data flow diagrams are prepared for each program from the decomposed DFDs created during the design phase. These DFDs define the function of each program.

2) In program planning, the logic to be used to solve the problem is developed. Algorithms, computer program logic flowcharts, and structure charts are useful tools for program planning. Algorithms are sets of rules or instructions used to accomplish tasks.
3) The next step, writing, or coding, a program, is the actual writing of computer instructions. These instructions will be translated to machine code and followed by the computer; they should follow the steps of the program logic plan.

Several programming languages, particularly c++ and visual studio, are commonly used to solve business problems. In addition to these traditional languages, organizations using data base management systems may choose to generate programs using the query language of the data base management systems. These query languages are a part of a package of programming tools known as fourth-generation languages. Each language has its advantages and disadvantages.

4) **Testing and debugging a program involve:**

   (a) Translating the coded program into machine language, a process called compilation

   (b) Testing the translated program with sample data and checking the result. If the results of testing are not correct, the program is said to have “bugs.” Debugging is the process of correcting computer programs to obtain correct results.

Testing must be planned and structured to reduce the chance that errors will be overlooked.

5) The last step is to complete the documentation for the program. The documentation must include:

a) a statement of the purpose of the program (from step 1),

b) a description of the solution logic (step 2),

c) a listing of the program instructions (step 3),

d) and sample outputs from the completed programs (step 4).