1. (15 points) Show the number -5 by 8-bit binary codes using the two's-complement representation. Also give an example to explain the problem of overflow.

2. (15 points) Give the full names of the following acronyms:
   CPU, RAM, WWW, URL, http.

3. (20 points) Convert the following infix expression into a postfix expression:
   \((2 + 3 \cdot 5) \cdot (8 - 3 - 2) \cdot 5 + 3\).
   Also briefly describe how to evaluate postfix expressions.

4. (15 points) Let A be an adjacent matrix for a simple graph \(G = (V, E)\), where \(V = \{1, 2, \ldots, n\}\), and \(A[i, j] = 1\) if node i and node j are adjacent, where \(1 \leq i \neq j \leq n\). Otherwise, \(A[i, j] = 0\). Describe briefly how to determine whether or not given any two distinct nodes i and j there is a path connecting these two nodes. And find a shortest path if they are connected. Give necessary data structures in order to get credits.

5. (15 points) Given a C programming data structure as the following:
   ```c
   struct node
   {
   int value;
   struct node *left, *right;
   }
   ```
   design a recursive C function (or a recursive function in some other programming languages) to find the total number of leaves of a binary tree. The heading of the definition of the function is as follows:
   ```c
   int total_leaves(struct node *root).
   ```
   The call `total_leaves(rootnode)` by passing the root rootnode of a tree will return the total number of leaves of the tree.

6. (a) (10 points) Given a bipartite graph \(G = (V_1 \cup V_2, E)\), where \(V_1\) and \(V_2\) are disjoint, show that the difference between the number of nodes of \(V_1\) and \(V_2\) is less than 2 if there is a Hamilton path in \(G\).
   (b) (10 points) Given a graph as follows, is there any Hamilton path in the graph? If there is one, then show it. Otherwise, explain why.