1. (2 marks) Consider a hash table of size $N = 7$ where we are going to store integer values. The hash function is $h(k) = k \mod 7$. Draw the table that results after inserting, in the given order, the following values: 5, 15, 12, 26, 11. Assume that collisions are handled by separate chaining.

2. (2 marks) Show the result of the previous exercise, assuming collisions are handled by linear probing.

3. (2 marks) Repeat exercise (1) assuming collisions are handled by double hashing, using secondary hash function $h'(k) = 5 - (k \mod 5)$.

4. (3.5 marks) Solve the following recurrence equation and give the order of $f(n)$. You must show how you solved the equation.

   $f(1) = 3$

   $f(n) = f(n - 1) + 2n + 1$

5. (i) (7 marks) Write in pseudocode an algorithm `min-degree(r)` that receives as input the root $r$ of a tree and it outputs the minimum degree of the internal nodes in the tree.

   For example, for the following tree the algorithm must output the value 2 as node $a$ is an internal node with minimum degree and its degree is 2. Note that node $b$ also has minimum degree but this fact does not change the output that the algorithm must produce.

   ![Diagram](image)

5. (ii) (3.5 marks) Compute the worst case time complexity of your algorithm as a function of the total number $n$ of nodes in the tree. You must give the order of the time complexity of the algorithm, and you must explain how you computed it.