1. Construct nondeterministic bottom-up tree automata accepting the following tree languages over the alphabet \( \{a, b\} \):

- trees \( T \) in which every node is labeled \( a \);
- trees \( T \) that have a branch (i.e., a path from the root to a leaf) of even length.

Each one is worth 1 mark.

2. For each of the two languages above, write an MSO sentence that defines it. Each is worth 1 mark.

3. Write an MSO sentence that defines the set of trees in which there is a branch labeled only with \( a \). (1 mark as well).