Design an algorithm for verifying the satisfiability of a formula $\alpha$ in CTL. That is given a model $M$ with a marked state $s$, $M, s \models \alpha$? For simplicity you can assume $M$ to be a tree and $s$ its root. Further prove the correctness of this algorithm and estimate the time and space complexity of the algorithm.

(Hint) Assume that $\alpha$ uses only modalities from $O = \{\text{EU, EX, EG}\}$. This is valid because $O$ is a minimal operator set. $\alpha$ is of the form $\oplus \alpha'$, where $\oplus \in O$ hence handle $\alpha$ recursively. Keep in mind $\alpha'$ can be a prepositional formula.

Further Section 3.6.1 of the textbook has the algorithm. You can use it. An actual implementation of the algorithm will get you more points. However I will still need the pseudocode.