Comments

Q1.a) Overall the performance for this question was satisfactory. Most candidates were able to provide a proof or counterexample for the two Big-O notation statements. In particular, some candidates were able to correctly classify them (e.g., valid or not), but they did not provide any further explanation (e.g., proof or counterexample). As a result, some candidates did not get full marks for this question due to the lack of explanation.

Q1.b) Most serious attempts for this question got this one right. However, various candidates were unable to apply integral or proof by induction to find the complexity of each loop.

Q1.c) Generally, candidates got this right. In particular, they were able to apply the substitution method, but some candidates were unable to correctly apply the master method to solve the recurrence question. I was forgiving in case of failure to correctly apply the master method, e.g., some candidates correctly identified the particular case for the master method but they incorrectly applied the steps.

Q1.d) This question was very well done. Most candidates were able to write the pseudocode and respective recurrence equation for the proposed binary-search algorithm. Only a few candidates were unable to explain the complexity of the proposed binary-search algorithm.

Question 2

This question was concerned with the comparison between binary search and AVL trees. In the first part the task was to give the best case, average and the worst case asymptotic complexity of the search operation in these trees. Most of the students have got this part right, although there were some mistakes regarding the trivial (best) case scenario. The second part of the question required to describe a simple linked data structure for representing trees. Those who read the question properly had got it right (as it is bookwork), but there was a sizeable number of students who tried to describe any other data structure for trees except the linked one. This happened despite repeated warnings in lectures to read carefully questions in the exam before attempting to answer it. In the final part the students had to perform a task of inserting a set of keys into an AVL tree, rebalancing it in the process. There was a good percentage of correct answers, and the mistakes occurred mainly in the rebalancing procedure. Overall, 218 students took the question, of which 31 had less than 10 marks, while 155 students had more than 14 marks, which does look a very good performance.