General Remarks

Most candidates attempted five, six or seven questions, and scored the majority of their total score on their best three or four. Those attempting seven or more tended not to do well, pursuing no single solution far enough to earn substantial marks.

Comments on individual questions

Q1   This was the most popular question on the paper, and many earned good marks on it. Nearly all the candidates followed the hint, and most then applied the same trick with the third equation. Subsequent success depended on a candidate realising that they had simultaneous equations in xy and $x + y$, although very rarely some managed to solve directly in x and y.

Q2   About three fifths attempted this question, often obtaining the starred result and the familiar $S3(n)$ successfully, but with $S4(n)$ tripping up many. Any that made progress on part (ii) tended to be able to complete the whole question.

Q3   Just under half attempted this. Most were reluctant to use parametric differentiation. Some found T's coordinates successfully and got not further, but most either made very little progress on the whole question, or got right through it.

Q4   Almost exactly the same number attempted this as question 3, but with much less success. The initial inequality was frequently poorly justified, but some managed to apply it correctly to obtain the starred result, and went on to do part (ii) respectably. However, for most, it was a case of all or nothing.

Q5   In terms of attempts and success, this resembled question 2. Apart from some that made no progress at all, the induction was accessible to many, as was the expression for $Tn(x)$. In both of these there were frequent gaps or inaccuracies even though the solutions were understood in essence.

Q6   More than 80% attempted this, and with more success than any other question. Having obtained the relation between x and p in each part, quite a few attempts then treated these as differential equations rather than merely substituting back to find expressions for y, and consequent inaccuracies lost marks.

Q7   Less than a fifth attempted this and frequently with little success except for obtaining the initial result. The configuration for part (i) tripped up many, although some skipped that to do part (ii) successfully.

Q8   Three fifths attempted this with most scoring about two thirds of the marks. Apart from minor errors, the last part (expressing T in partial fractions etc.) was the pitfall for most.

Q9 Of the three Mechanics questions, this was the most popular with just under a quarter of the candidates attempting it, but with least success. In spite of obtaining the relation in the stem of the question, many failed to appreciate its consequence for the acceleration-time graph in part (i) and as a consequence made little further progress. If candidates managed part (i), then they tended to complete the question barring minor errors, and the occasional assumption that the final simple case was simple harmonic motion.

Q10 Just under a fifth attempted this, but many dealt successfully with the *n* short strings case to earn about half the marks. Occasionally a candidate would obtain the required length result for the heavy rope and fail to apply the same technique for the elastic energy, but apart from minor errors, most that appreciated how to take the limit had few difficulties.

Q11 Under a twelfth tried this. A number of different correct approaches were successfully applied, and there were very few partially correct solutions.

Q12 Little more than a handful of candidates attempted this with three strong attempts (near full marks) and the remainder making no headway at all.

Q13 About a ninth tried this. Apart from those who had no idea, there were three categories of attempt. The first group obtained the first result but did not spot that regardless of what happens in the first step, immediately after it there are $2n - 2$ free ends. The second group safely navigated the results for the general case but could not see how to apply the approximation to obtain the result in the specific case, and the final group had the satisfaction of finding the result. Most fell into the first category, with fewer in the second, and a small number in the third.