

STEP II, 2006, Q10 EC

- 10 The most popular of the three Mechanics questions, and generally the best done. Even so, marking was often made unnecessarily difficult by candidates' failure to explain what was going on and/or simplify their working at suitable stages in the proceedings. Setting up and finding the post-collision velocities of the various particles was relatively straightforward – although the algebra did prove too demanding for quite a few candidates – and most attempts correctly indicated the condition required to give a second collision between A and B . The number of unsuccessful attempts to solve the resulting quadratic was a surprise – most presumably faltering due to the lack of a unit x^2 term! – as was the number who preferred to use the quadratic formula rather than factorisation.

Problems generally arose here in part (ii), where a lack of explanation was a big problem. Those candidates who simply work out times and distances, without saying what they are supposed to be, do themselves no favours, as it is very difficult for the examiners to give credit to the working until a coherent strategy has emerged. Any error, no matter how small – and especially those made by candidates working “in their heads” – can render it almost impossible to spot such a strategy and reward it. On a more fundamental level, part (ii) should have opened up with the statement of the three relevant velocities, given in terms of u , using $k = 1$. Most efforts made mistakes because this simple task was left until much later on in the working, and some candidates even insisted on working with a general k throughout.



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