Examiners' Report
Principal Examiner Feedback
November 2021

Pearson Edexcel GCE AS
In Mathematics (8MA0)
Paper 22 Mechanics

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Introduction

The entry for this paper was small. The vast majority of candidates offered a response to all three questions and there was no evidence of time pressure. The candidates showed some understanding of the topics examined but did not always use the information given or follow the instructions in the questions. As has been noted in previous papers, accuracy marks were often lost through slips in algebraic manipulation

Question 1.

(a) Many candidates just found the time to the top, losing both marks.

(b) There were very few fully correct answers because most candidates did not realise that they had to consider the change in direction and just put $t = 4$ into a *suvat* equation. Some found the distance to the top and then used $t = 2.5$ to find the remaining distance but then did not round the answer to 2 or 3 sf following use of $g = 9.8$. A few used $g = 9.81$ or 10 despite the clear instruction on the front of the paper.

(c) Candidates had very little idea – considering the mass was the most frequent incorrect response. Some quoted air resistance even though that had been specifically excluded in the question.

Question 2.

(a) Most candidates knew that they needed to differentiate but integration was also seen once. Some went on to put $a = 0$, solving to get $t = 5$ which they went on to use in part (b) but this subsequent working was ignored in part (a).

(b) The majority used $v = 0$ when $t = 6$, found a value of k and obtained a quadratic. Unfortunately, many made sign errors and their expression had +24 instead of -24. If they went on to solve their incorrect quadratic using a correct method, these candidates scored two of the four marks available. There were several completely correct answers.

(c) Some candidates knew that they needed to integrate v but a few tried to use *suvat* equations, losing all the marks and some did not substitute a numerical value for k. The last two marks were rarely scored as the change of direction was not appreciated.

Question 3.

(a) There were many completely correct answers and those who took the acceleration to be positive in a different direction could also score full marks. Some had no idea where g should go so answers like '$T – 2m = 2mga$' were sometimes seen. The mass m was occasionally left out also. A few quoted *suvat* equations, connecting time and distance, instead of equations of motion for P and Q but if they went on to use correct equations of motion in part (b) they scored the marks for part (a). Some had no idea at all and T never appeared.

(b) Those who had correct equations of motion generally went on to find the acceleration but some missed g in their answer. Not many progressed successfully after this - some found T because that is what is usually required but in this question, it was not necessary. Some calculated the time taken for Q to reach the ground and used it in an equation for P, not

realising that they had to find the velocity that *P* had acquired. Of those who did make progress, some missed the *h* in their answer for *v*, and others only added 2*h* instead of 3*h* in the final step.

(c) A very small number answered correctly. Mass was again a common response.

(d) Again, there was a very small number of correct responses, some of which were spoilt by saying that the reason for the accelerations being different was that the tensions were different because of friction at the pulley.