



**General Certificate of Education**

**Mathematics 6360**

**MM2B      Mechanics 2B**

**Report on the Examination**

*2007 examination - January series*

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## General

The candidates were well prepared for the paper, showing thorough knowledge of the specification content and of the techniques required. The standard of work was mostly high, and solutions were concise and clearly presented. Algebraic work was mostly good, but in some cases answers were left unsimplified.

## Question 1

Parts (a) and (b) were answered very well. Some omitted part (c) while others stopped after finding the change in energy.

## Question 2

Diagrams in part (a) were mostly good, with occasional errors in positioning the weight. Part (b) was mostly done correctly but there was some inaccuracy in manipulating simple equations to find the tensions. Most gave appropriate responses in part (c).

## Question 3

Part (a) was popular and done well. Part (b) was found harder than expected, with some considering the situation as static, and others omitting the weight, while sign errors were quite frequent.

## Question 4

Parts (a) and (b) were done very well. In part (c) those who correctly identified the relative positions of  $X$  and the centre of mass of the lamina usually completed the question successfully.

## Question 5

This question proved demanding. Parts (a)(i) and (a)(ii) proved successful, but part (a)(iii) was the most demanding part of the paper, with few picking up the earlier hint about the motion, and many giving answers in degrees. Most began part (b) correctly but differentiation was surprisingly poor. Part (c) also started well with attempts at the acceleration and the use of Newton's second law. The hardest part proved to be the correct use of the trigonometrical identity to find the magnitude of the force at time  $t$ .

## Question 6

Part (a) was popular and done well. Part (b) often began well but many candidates were unable to find a correct and suitably simplified expression. A significant number did not know a correct formula for the acceleration, or confused  $v$  and  $\omega$ . Parts (c)(i) and (c)(ii) were mostly done well, and in part (c)(iii) those with correct radial equations usually completed the question successfully.

## Question 7

Most candidates completed part (a) convincingly. Part (b)(i) was popular, and in part (b)(ii) the majority of candidates were able to separate the variables correctly and attempt the integration. However, there were many errors, the most common being the omission of a constant of integration and careless slips involving signs.

## Question 8

Candidates were often very successful in parts (a) and (b). Most knew how to start part (c)(i) but elastic energy terms were sometimes omitted and there were many errors in potential energy terms. Part (c)(ii) was successful but not all selected the appropriate solution.

## **Mark Ranges and Award of Grades**

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