General Certificate of Education

Use of Mathematics 5351

UOM4/1 Applying Mathematics Paper 1

Report on the Examination

2010 examination - June series

Applying Mathematics Paper 1 (UOM4/1)
Examination

General
As in previous years, it was noticeable that candidates in some centres had been thoroughly prepared for this paper; conversely there were other candidates who had been less well prepared. Some candidates were careless in their working and presentation of results or made their work more complex than necessary. It is important for candidates to pay more attention to accuracy as not doing so can lead to losing marks that are difficult to recoup elsewhere. Again, as in previous years, some candidates demonstrated that they had not really engaged carefully enough with the pre-release material which gave many pointers as to what was likely to be expected. On the other hand, many other candidates demonstrated that they had carefully prepared for the paper and were comfortable with what was expected.

Question 1
Responses to this question demonstrate the benefit of candidates' thorough engagement with the pre-release material and understanding the mathematical principles that underpin this. Those candidates who thoroughly understood that after every 3.8 days the mass of radon-222 is halved were able to answer the question using a variety of different approaches. On the other hand, those who did not understand this were at a loss as to know how to proceed.

Question 2
The majority of candidates were able to make some attempt to show the required result which involved filling in the missing steps in a mathematical argument in the pre-release material. It seems evident that many candidates had been well prepared to do this. However, as may be expected, some candidates made some progress towards the result but being unable to complete this tried to use mathematical sleight of hand to suggest that their argument arrived at the final result. When asked to "show clearly the steps" that lead to particular result candidates should be aware that their working must be clear and will be examined at each stage.

Question 3
Responses to this question were very varied with some candidates gaining full marks whilst others were totally unsuccessful. A substantial number lost marks due to careless work, for example, making negative values positive and losing a zero after the decimal point to make the answer times too large.

Question 4
Although the majority of candidates correctly knew that the substance had a shorter half life than radon-222, many were not able to explain why this was the case. Candidates might be encouraged to use sketch graphs in such cases: they may develop these from any graphical work they might do using their calculators to arrive at the answer. A not insubstantial number of candidates suggested that the larger the value of the parameter λ in the function $m = m_0 e^{-\lambda t}$, the longer the half life.

Question 5

Responses to this question were mainly disappointing given that use of a very straightforward recurrence relation was required. Many candidates did not know how to proceed with the question at all and others misinterpreted the standard notation for such relations considering that m_{n+1} is effectively $m+1$. This is a recurring problem and is something that would benefit from some attention during preparation for the examination.

Question 6

Although the majority of candidates made some attempt at this question there were relatively few completely correct responses. Many candidates who were unable to proceed did not know how to cope with an unknown power although in many other places in the paper they had used logarithms effectively. A small number of candidates did not understand that their answer was in days and that they were required to convert this to hours. It is important that candidates read carefully information both in the question and the pre-release material to make sure that they are fully aware of how mathematical formulae are used to model reality.

Question 7

There was a range of responses to this simulation question with candidates demonstrating a range of different levels of understanding of what was required. In some cases candidates continued to assign random numbers to atoms after they had decayed and in other cases they were not always consistent in interpreting the random numbers they had assigned correctly. In the final part of the question, in which they were asked to interpret the results of their simulation, candidates did not always explain the reasoning behind what they had noticed and commented upon.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the **Results statistics** page of the AQA Website.