AQA

ASSESSMENT and

QUALIFICATIONS

ALLIANCE

General Certificate of Secondary Education

Mathematics (Modular) 4302
Specification B

Module 3 Higher Tier   43003H

Report on the Examination

2008 examination - March series

General

The paper contained some standard applications as well as questions set in context. The paper provided a tough challenge to many candidates with some seeming to be unprepared for certain topics. When questions were not attempted this was due to lack of knowledge rather than to having insufficient time. Most candidates showed their working but in some cases the work was difficult to follow or was ambiguous.

Using graphs, algebraic proportion, surds and bounds remained weak areas for many candidates. Written methods for fractions continued to cause many candidates difficulties and the order of operations and indices were often not understood. Some candidates may have been more suited to Foundation tier.

Topics that were well done included:
- distance, time, speed problem
- inverse proportion in context
- comparing a percentage and a fraction
- rounding to one significant figure for estimating
- plotting points on graph paper.

Topics which candidates found difficult included:
- finding reciprocals
- laws of indices
- standard form
- bounds
- negative and fractional indices
- solving quadratic equations graphically
- surds.

Question 1

This opening question was well answered although some candidates divided the numbers instead of multiplying them or decided to change the units.

Question 2

This question was also answered well. The majority multiplied 9 by 20 and then divided by 15. A few candidates tried seemingly random calculations with the three numbers.

Question 3

A large proportion of candidates gained full marks on this question. Some worked out Adam's mark as a percentage while others found 65% of 40. Only a few candidates did a correct calculation and then chose the wrong person although some failed to make a decision. A significant number of candidates had no idea how to compare the marks.

Question 4

Part (a) was quite well answered although a number of candidates could not key in calculations involving several operations correctly. In part (b) there were many who rounded to three decimal places and overall this standard process was not carried out well.

Question 5

Many candidates did not know the meaning of reciprocal which meant that part (a) was poorly answered or not attempted. Some wrote 1 over 1.25 but failed to work this out which is a straightforward task using a calculator. Part (b) was answered quite well but part (c) proved more challenging. Part (d) resulted in a disappointingly small number of candidates gaining both marks. Some obtained 0.013 but were unable to convert it correctly to standard form. Some carelessly gave the power of 10 as 2 instead of –2. Others had a power of –3 or 28. Many converted out of standard form which then proved too difficult to process.

Question 6

In part (a) many candidates were not familiar with the multiplier needed for decreasing by 3%. A majority of candidates gained some marks in part (b). More candidates would have gained full marks had they rounded their answer to the nearest hundred. Some only gained the mark for rounding and others used simple interest. Few candidates multiplied by a power of 0.97. Most candidates worked a year at a time, finding 3% and then subtracting, but made arithmetical or rounding errors.

Question 7

Knowledge of the laws of indices was very poor. Many tried to evaluate the expression and quickly ran into difficulties. Those who worked using index form frequently obtained a numerator of 5^{11}.

Question 8

Part (a) was a standard question and proved straightforward for those candidates familiar with the idea of direct proportion, although a significant number did not account for the square or used inverse proportion. Many candidates presented their answers poorly and their work was ambiguous. Many candidates did not understand this topic. Part (b) also produced a mixed response. Part (c) was very poorly answered even by those who had answered part (a) successfully.

Question 9

Many candidates did not understand this topic. Those who made progress often gave an incorrect upper bound of 72 500. The idea of rounding to the nearest 500 proved challenging to many candidates. Some knew that they had to subtract a lower bound from an upper bound in order to obtain the maximum number of males, but fully correct solutions were rare.

Question 10

Many candidates knew to round the numbers to one significant figure and did this correctly. However, most were unable to use the order of operations correctly. A significant number of candidates made no attempt to estimate and wasted time trying to evaluate an exact answer.

Question 11

Part (a) was answered quite well. Part (b) was more demanding but also answered reasonably well. The majority of errors involved the position of the decimal point. Only a few did not try to use the given calculation. However in part (c) there were more who attempted a long

multiplication. A significant number tried to work out 142.5 + 3.75 and most of these were processed correctly.

Question 12

Part (a) was poorly attempted with the most successful method being to convert the fraction to 0.6 before dividing by 4. In part (b) most candidates did not know 56^0 = 1 with nearly all of these writing it as 0. Both parts of (c) were answered poorly and often not attempted. In part (i) many divided 27 by 3 and then by 3 again. Many candidates did not realise that part (ii) was linked to part (i).

Question 13

Many candidates did well on this question. The most common error was to divide the Year 10 pupils in the ratio 4 : 5. A few candidates worked out the number of boys in the assembly. Some careless arithmetical errors were made with 84 ÷ 4 = 22 being quite common. A number had no idea how to deal with either year group.

Question 14

Part (a)(i) was better answered than part (a)(ii) although standard form continued to be a difficult topic for many candidates.

Question 15

A large majority of candidates did well in part (a). Using the graph in part (b) was not well understood and this part was often not attempted. Some were able to draw the straight line in part (c)(i). Part (c)(ii) proved too difficult for most of the candidates and was not attempted by many. Poor presentation and arithmetic made some answers ambiguous as it was not clear whether functions were being added or subtracted.

Question 16

This question was often not attempted. Those who made progress gained marks in various ways, most commonly by rationalising the denominator. The absence of brackets when substituting $2\sqrt{3}$ into the formula was a common error. Many substituted a value for π even though the answer was asked for in terms of π.