AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Education

Mathematics 6360

MD01   Decision 1

Report on the Examination

2008 examination - June series

General

Most candidates were quite able and adequately prepared for the exam, with just a few very weak scripts. The majority of candidates scored between 40 and 70 marks. Although some scripts were very well presented, generally scripts are untidily written and a sizeable minority are very poorly presented.

Question 1

Part (a) was extremely well done, with the majority scoring full marks.

In part (b), there were many fully correct answers but the question discriminated quite well. A very small minority of candidates refrained from using any algorithm at all. A larger group persisted in doing all their algorithm work on one diagram, often the one offered for part (a). This resulted in a substantial loss of marks. Candidates are expected to present their paths explicitly and many were unable to do this with any clarity at all – there is much confusion between paths and possible improved matchings. Often candidates appeared to look for as many possible paths as possible, making no distinction between successful and unsuccessful, used or not for their solution and did not appear to realise that the order in which paths are used is sometimes critical.

Question 2

In part (a), most candidates selected the correct algorithm but almost half changed their criteria for choosing their pivot at some stage, usually to accommodate the placing of the letters at that stage. Pivots were not always indicated. Some candidates differentiated well in their indications between new and past pivots, but many didn't. A common error was to stop the algorithm when a set of two letters remaining could be seen to be in alphabetical order. A very few candidates did not appear to know the alphabet: the comparative placing of M and N was the usual difficulty.

Most candidates answered part (b)(i) correctly, even if a minority had to expend several pages working through a sort to find out. Part (b)(ii) was even more frequently correct, with just a small number of candidates having difficulty in expressing clearly what they wanted to say.

Question 3

Both parts of part (a) were almost always correct.

In part (b), the great majority used Prim's algorithm although a small but significant minority still do not make it clear from their working that Prim's is actually being used. The order of selection of edges must be clear. A few candidates started from *G* and a considerable number worked successfully until the 6th or 7th edge. The edge *BC* was often missed for a long time in otherwise correct work. Almost all candidates succeeded in drawing their minimum spanning tree and correctly adding up its length.

Question 4

Overall this question discriminated well.

Part (a)(i) was almost always correct and most candidates also got part (a)(ii) correct. The most common errors in part (a)(ii) were simply to add numbers and not indicate the route clearly, or to omit the return to the start. Part (a)(iii) differentiated with a number scoring both marks and very few scoring neither.

In part (b), there was an unwillingness on the part of some candidates to explain which numbers related to which edges, and a large number of candidates produced tours without *B*. A few

candidates simply found a spanning tree. Surprisingly few seemed aware of the properties of the method which were sought in part (b)(ii). A minority of those who did wrote them down even though they clearly made nonsense of the answers offered for the previous part.

Part (c) allowed successful candidates to show their understanding of travelling salesman problems. Again it was surprising what some candidates were prepared to draw and write in the light of their previous answers.

Question 5

In part (a), the method was well known and most candidates scored heavily, although a surprising number failed to get the correct total for all three pairs.

After that there were a lot of problems and the question discriminated well. Roughly a third of candidates thought that parts (b) and (c)(i) could be solved by inspection and about half of them were successful. Another third resorted to attempting to work out the route, apparently by trial and error, and were usually unsuccessful. The remainder either omitted the questions or wrote a random number down. The clear majority answer for part (c)(ii) was *A*, *B*, *C* and *D*. Once again, the able candidates were usually correct.

Question 6

This question discriminated well.

Part (a) was done quite well. Only the weakest candidates failed to use the information correctly although a considerable number failed to state the function to be minimised.

Part (b) discriminated well. It continues to be the case that many candidates who appear to have no problem in writing down the inequalities and understand they must draw the lines representing these simply cannot draw the requisite lines. Some even drew the wrong lines parallel to the axes. In otherwise fairly successful work the feasible region was not always clearly indicated.

Part (c) caused major problems and very few candidates scored all 4 marks. The majority simply did not state clearly how they were trying to solve the problem, ie which point(s) they were looking at. This was important as the initially required point does not have integral coordinates. From those who did realise that an intersection point was needed, there was some surprisingly incompetent simultaneous equation work. Most of those who did find the correct coordinates then proceeded to use them and not look for qualifying points with integral coefficients.

Question 7

Part (a) was well answered; even the weakest candidates often scored full marks. Presentation appeared to have improved too.

Part (b) was not so well answered. Many candidates found the correct equations but once more they proved surprisingly challenging for AS-level mathematics students to solve.

Mark Ranges and Award of Grades

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