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Mathematics MD01

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Decision 1

Report on the Examination

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General

Once more, there were many well-prepared students quite capable of rehearsing familiar algorithms. Students seemed to cope a little better than in previous papers with anything slightly out of the ordinary or requiring thought. However, there was some lack of ability to use the English language clearly, precisely and without ambiguity. The general standard of presentation was quite good, with very few scripts unacceptably untidily written and presented.

Question 1

In part (a), apart from the rare slip or completely wrong format this was almost always correctly answered. Most students knew the answer to part (b), but many were unable to express it accurately. Many either stated the relevant specific links without explaining why they made a complete matching impossible, or made general statements about what constitutes a complete matching without tying it to the given situation.

Question 2

Apart from the weakest students, the sort was well known with very few offering an incorrect method. Number work was accurate and usually very clear. Knowledge that a third pass was required was much improved from that in similar situations in the past, but this was still overlooked by a significant number of students. If the correct sort was used, the second part of the question was almost always correctly answered.

Question 3

Generally the answers to part (a) were a very high scoring. Working was shown clearly and calculated accurately although there was, as in previous papers, a surprising number of students who didn't believe that the total length of the network was 118! The second part caused more difficulties. Many students did not realise that 'the number of visits' = 'degree of vertex' / 2, and resorted to finding a detailed route, with varying degrees of success, and then counting each occurrence of a vertex.

Question 4

The three sections of part (a) were invariably correctly answered and clearly presented. Part (b) proved to be more challenging. Students were asked for edges but 'G' and then 'F' were quite common as answers. Part (c) was well answered with very few incorrect answers.

Question 5

Part (a) was very well answered, and this showed a significant improvement on previous papers. A few students contributed to their own downfall by the use of very faint, spaced out shading – this often made it appear that the small triangle below the line $y = 20$ was to be included in the feasible region. In part (b), marks were lost for not stating the x and y values, and in (ii) for thinking that integer values were needed despite this constraint not having been specified. Students also showed a marked reluctance to use fractions.

Question 6

Many students scored full marks in part (a). The presentation and accuracy of use of Dijkstra's algorithm was excellent. Although many students scored full marks in part (b), it was noticeable that a significant minority could not cope with either simple speed/distance/time calculations or the complexities of hours, minutes and decimals.

Question 7

This question on graph theory, as always, proved to be very difficult for most students and full marks were very rare indeed. Although many students scored the first mark in part (a), an answer of 8 was almost as common as the correct answer. There were very few correct answers to part (ii). In part (b), the pattern of marks earned was similar to that of the previous part, as it should have been. However it was clear that many had not seen the connection as their one mark was not always earned for the same part of each question. The standard formula of $n(n-1)/2$ was often not known and erroneous use of factorials occurred frequently. Only a minority of students gained any marks in part (c).

Question 8

Several students ignored the paper rubric and presented their working on the diagram in the question. The first three parts of the question were usually answered very well. Most knew the required algorithm for part (d), but while presentation is now significantly improved from that of past years, a significant minority still lost marks by not clearly detailing which edges were involved. Lettered labelling is required, not just numbers. For the last part, those who had the required two parts for the diagram remembered to join them. Surprisingly few students realised that the fact that this diagram was not that of a tour was significant, with many students stating that the route was the optimal solution (presumably because that is what the comment often involves)!

Question 9

Although questions in three variables had been set on a number of occasions in the past, this question was poorly answered. Simple inaccuracies, the apparent failure to understand the idea of simplification, the cavalier use of inequalities and the failure to use the correct variables, all combined to provide evidence of weak algebra skills.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website: http://www.aqa.org.uk/over/stat.html

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.

UMS conversion calculator www.aqa.org.uk/umsconversion