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Free-Standing Mathematics Qualification

Using and Applying Decision Mathematics 6994

Advanced level

Report on the Examination

2010 examination – June series

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Using and Applying Decision Mathematics (6994) Examination

General

In general the paper seemed a fair test for the candidature and discriminated quite well overall.
As last year, most candidates were at least adequately prepared for this examination. Again, there was a difference in performance for candidates on the Critical Path question, where candidates who used 'activity on arc' performed significantly less well than candidates who used 'activity on node'. Centres which currently use 'activity on arc' are strongly recommended to re-think their teaching of this topic.

Question 1

Most candidates knew how to answer the first three parts, but a significant number could not sustain accuracy throughout. Once more those who used activities at nodes seemed thoroughly at home with the work but this did not apply to those using activities on arcs – very few of these could sustain the method. Most stated the correct non-critical activities in (d) but many were unable to obtain all the correct float times. More could deal with floats than last year but this was still a weakness in the drawing of the Gantt diagram.

Question 2

Many candidates scored well in part (a), although full marks were rare, with simple numerical slips being the most common problem. Candidates needed to find the shortest 'distance' between pairs of vertices.
Part (b) was challenging, but it was pleasing to see a number of candidates producing perfect solutions.

Question 3

The method was well known and many scored full marks. Simple arithmetic was the biggest problem for those who failed to earn the full quota. In part (c) candidates needed to draw their minimum spanning tree and not merely shade edges on the given diagram.

Question 4

Most candidates appeared to be familiar with Dijkstra's algorithm but many could not annotate their diagram properly. Many simply resorted to adding all alternatives and then trying to fiddle the presentation.
Part (b) was correct more often than not, though the answer was often obtained simply by variations of trial and error!

Question 5

The presentation on this question was often poor. Those who used a matrix method – either the printed question or their own drawing – were usually completely unclear as to the order of arcs. Too often mere strings of numbers were written down with no indication of arcs. 'Tour' was not properly understood by a significant number of candidates, who failed to return to the start.
A number of candidates answered part (c) correctly, but many were unsure either about a tour or a connection with the previous parts.

Portfolio
FSMQ Advanced Level – June 2010

It was pleasing to see a great deal of variety in the portfolios produced for the Advanced level FSMQ. In the spirit of FSMQ many centres encouraged candidates to obtain data or develop projects from other areas of study. It should be noted that a high mark in Strand One cannot be achieved by candidates unless independence in the true sense of the word is demonstrated, not just carrying out a given project without advice.

Most centres submitting 'Working with Algebraic and Graphical Techniques' portfolios ensured that candidates produced a report on fitting a function to non-linear data by plotting a linear function. This is an essential requirement and candidates not including this work can only achieve a maximum mark of 24. There should also be a demonstration of algebraic manipulation and techniques and if this is not present the maximum mark would be 35.

There were some interesting portfolios produced for 'Using and Applying Statistics' with examples from biology and geography. For a mark of 40 or over candidates must include high level work on such statistical topics as Mann-Whitney, t-test, Chi-squared or Wilcoxon signed rank test etc.

Portfolios produced for 'Using and Applying Decision Mathematics' developed a range of projects, from wedding planning to a dinner party. Candidates can often relate their analysis to 'real life' by carrying out the tasks described and finding if there are any hidden pit falls not realised during the design.

The vast majority of candidates demonstrated the need to check their work, especially in the Algebra portfolios; although some candidates did not actually state that they were "checking".

Candidates did summarise their work and in many cases looked at their initial assumptions and how they affected the outcomes.

It was very pleasing to see excellent internal moderation from centres and also the detailed comments on the Candidate Record Forms. Please continue to provide these as they greatly assist in moderation.

Mark Ranges and Award of Grades

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