Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2025

Pearson Edexcel GCE
Further Mathematics (8FM0)
Paper 28 Decision Mathematics 2

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Introduction

The paper proved to be accessible to almost all learners, with many demonstrating sound knowledge of all the topics. Many produced well-presented solutions, using tables and diagram printed in the answer booklet, although some work was difficult to decipher. Learners must be reminded to display their methods clearly, as Decision Mathematics is a method-based examination.

Report on individual questions

Question 1

While most learners attempted the explanation required for part (a) of this question, many of the responses were confused and lacking in detail. Learners were also unsure of the order needed to deal with the two modifications required, with some placing large values in the prohibited cells before subtracting all values from the largest in the table. However, most learners were able to carry out the necessary steps and produced a correctly modified table. Most learners then correctly reduced rows and columns, although some failed to add the necessary comment to explain what they were doing. Most learners then applied the algorithm correctly, although a small number used too many lines to cover zeroes (4 instead of 3 or 5 instead of 4) or made errors in their working. A few learners attempted this as a minimise problem instead of maximising. Some learners failed to explain how they knew whether the table was optimal and some failed to state the maximum total profit.

Question 2

Many learners struggled to answer part (a) in sufficient detail, for example just stating “cannot exceed capacity” without relating this to the flow in an arc. Most learners listed the saturated arcs correctly and many also calculated the value of the cuts correctly, although there were some errors seen. While many learners did give the correct flow augmenting route, there was a significant minority who failed to find this. As a consequence, there were a number of errors seen with the final flow diagram and some learners did not attempt this. Those learners who did attempt the final flow diagram generally went on to attempt to prove that the flow was maximal by finding a cut through saturated arcs. However, there were a number of errors seen, either with an incorrect cut, not stating the value of the cut or flow or failing to write the conclusion that, due to the Maximum Flow – Minimum Cut theorem the flow is maximal.

Question 3

Most learners attempted to find the row maximin and column minimax, although a small number made errors in this process. Having done so, many learners then stated the correct play-safe strategies and, giving a reason, stated that the game is not stable, although some omitted the play-safe strategies. A significant number of learners either did not attempt part (b) or made an error in their calculations. Most learners were able to write down the correct three probability expressions, although some failed to define their probabilities before doing so. Most then went on to draw a graph of the three lines, although some were poorly drawn with the horizontal axis extending way beyond 1 and one or more lines incorrect. Those learners who drew an accurate graph then attempted to calculate the value of p, although some incorrectly used the intersection of $5p - 4$ and $7p - 5$ for this. Most then stated the strategy for Layla, using their value of p.

Question 4

Many learners struggled with this question, as they did not realise that it was necessary to rearrange the recurrence relation before obtaining the complimentary function. Although many learners chose the correct form for the particular solution $\lambda n + \mu$ they did not substitute this correctly into the recurrence relation and therefore were unable to obtain the correct values for λ and μ. Relatively few learners obtained a fully correct solution to part (a). Part (b) was very poorly done, with very few learners scoring more than 1 mark. Those learners who had the correct solution to part (a) and then attempted this, generally calculated values for u_2 u_3 and u_4 and then stated that there was just one negative term. Very few learners considered the odd and even terms separately and, while some stated that $(-1/2)^n$ would tend to 0 as n increased, very few attempted to calculate when $n/2 > 7/6$, which was required to fully explain their solution. A few learners who did not have the correct solution to part (a) attempted this, but, again, failed to build a complete justification for their answer.

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