Questions matter

Level 3
Certificate in Mathematical Studies

1350/2B Critical Path and Risk Analysis

Report on the Examination

1350
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Question 1

This question required students to use the information in the preliminary material about the economics of music streaming. **Part a** was an excellent start for nearly all students. Whilst most were then able to score on **part b**, often improvements about the diagram or text of the report were described rather than the about the graphs. Some responses were too terse to be acceptable descriptions of an *improvement*; responses such as simply 'grid lines' were not awarded a mark. Similarly, responses to **part c** were often too vague to be given credit.

The mark scheme for **part d** accommodated a variety of valid approaches. Only around half of the students successfully began to make a comparison between the two groups. Fewer still were able to reach an acceptable conclusion, with responses such as 'more listeners at the sports club' rather than 'a greater proportion at the sports club' only scoring one mark from the possible two.

Part e was a better source of marks for most students, with around 30% scoring full marks. A wide variety of approaches to comparing the 25% : 44% ratio found in the preliminary material with the 4 : 7 given in the question were seen and accommodated by the mark scheme. Many students were more comfortable working with actual numbers of subscribers, often finding 9.9 million and 5.7 million as a first step to avoid working with the proportions from the report.

Most students were not well prepared for **part f**, which required a good understanding of graph 1. Only around 10% of students were able to explain why it would not be valid to add together the percentages on the 'daily active users' bars.

Question 2

On **part a**, most students did not understand that the £9.99 per month figure already included VAT, and therefore was 120% of the ex-VAT price. Those that did show this understanding were generally able to justify that the government therefore receives £1.67 rather than the £2 that Molly claimed.

Part b was answered well, with most students able to identify at least one of the three potential mistakes in the calculation. An incorrect answer frequently seen was 'the yearly cost isn't £9.99' suggesting that some students did not realise that the calculation and result that followed ('× 12 = £119.88') were part of the statement about the yearly cost.

Question 3

This question asked students to write a brief report and most students followed the suggested two bullet points, each of which was allocated two marks.

Most students scored well on the first bullet point. However, to be awarded the second mark differences needed to be calculated and stated. Unusually, a number of students described the change in reverse chronological order, eg 'entries for French went up by 24017 from 2022 to 2012'.

Marks on the second bullet point were lower, with many students not calculating a proportion (for example, a percentage) of students who were male. Others did calculate proportions but did not make a comparison between them.

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Question 4

This question asked students to calculate probabilities and estimates from the provided two-way table. On **part a**, many students incorrectly gave a fraction with a denominator of 250. This should have been 146 due to the statement that the household owns a laptop.

Students were more successful on **part b**, generally working out first the number of households in the UK before then estimating the number that own a laptop. A number of students only scored two out of the three marks as they wrote 17.1 rather than 17.1 million as their answer.

Only around a third of students scored the mark on **part c**, with 'because I rounded my numbers' being the most common response that was not given credit by the mark scheme.

Question 5

Critical path analysis continues to be a strength for many students on this paper. Almost all students were able to draw a correct activity network from the information in the table. Most students gave themselves enough room to show clear working. This was especially important, as many of the times in the diagram needed recording with three digits. Around 80% of the students successfully completed the forward pass on their diagram. However, the backward pass continues to prove more of a challenge, with marks lost at the decision points on the network.

Around three quarters of students correctly stated the critical path in **part b**.

The interpretation required in **part c** caused more difficulties for students. On **part c i**, students needed to work with time. In general, those who converted 132 minutes into 2 hours and 12 minutes were able to correctly work out the time that Anna needed to start making the pavlova. Those who, instead, attempted to work with decimal hours or raw minutes made errors and lost marks. A significant minority of students worked with the total duration of all activities from the table, suggesting they do not necessarily understand the meaning of the finish time of the final task.

Part c ii required a good understanding of float which fewer than one in five students were able to demonstrate. Some explanations were insufficiently complete to be awarded the mark. For example, many students compared the durations of activities A and B with that of C, without taking into consideration activity D.

Question 6

Part a was not well answered. As the question said that two students were chosen, the second student would have been drawn from the 119 students remaining after the first had been selected. Typically, two denominators of 120 were seen, rather than one of 120 and another of 119. In addition, most responses did not take into consideration that there were two ways the historian and geographer could have been selected.

In comparison, **part b** was a better source of marks. Most students took an informal rather than algebraic approach for finding the two missing values from the Venn diagram. However, it was rare to see a fully

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correct solution where the number of history students was double the number of geography students once the 8 students who took both was taken into account.

Part c was the best answered part of this question, and we were able to apply follow through marks from incorrect Venn diagrams because of the good written working seen.

Question 7

This question required students to interpret a Gantt chart. **Part a** considered a claim about the total length of the project. Two common errors were seen when reading from the Gantt chart. The first was not to consider the scale of the horizontal axis, with students often using '17 weeks' rather than 18. The second was to add all the individual durations together, therefore not taking into account that some activities happened at the same time.

Students then needed to work out the date at which the project would finish. Unfortunately, not knowing the number of days in the months (or, indeed, the number of months between September and December) meant that some students lost marks on this part.

Part b was better answered. However, as with question 5 not all students had a sufficiently deep understanding of float to work out that the additional five-week duration would only cause a one-week delay.

Question 8

Risk analysis continues to be the most challenging topic on this paper for most students. The additional structure in this year's question still did not encourage more students to calculate expected values (eg, by multiplying a cost by the probability of that cost happening).

On **part a**, we directly asked for the expected cost to be calculated. Whilst most students were able to score some marks (eg that 2% of cars need to be towed each year), only around 15% of students were able to work out the expected cost requested. We continue to see written responses such as "There is a 2% chance of having to pay £115", lacking the crucial step of multiplying the probability by the cost.

At least three quarters of students made some progress on **part b**, but fully correct solutions were rare. In contrast, the final two question parts were answered better, with some good explanations about why Pete may choose the more expensive breakdown insurance in **part c**. Most students were also able to reason correctly that his expected cost would decrease in **part d** if Pete did not drive his van at weekends.

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Mark Ranges and Award of Grades

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

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