Questions

Q1.

A food critic was asked to compare six mince pies (labelled A to F) and to rank them in order of quality.

Jacques wants to see if the price of a mince pie depends on its quality.

The tables show information about these six mince pies.

Quality rank	Mince pie
1 (highest quality)	B
2	A
3	C
4	F
5	D
6 (lowest quality)	E

Price rank	Mince pie
1 (highest price)	C
2	B
3	A
4	F
5	E
6 (lowest price)	D

Jacques calculates Spearman's rank correlation coefficient for the quality ranks and the price ranks.

(a) Explain whether or not this is a sensible statistic for Jacques to calculate.

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(2)

The value of Spearman's rank correlation coefficient calculated by Jacques is 0.77

(b) Based on this value, write down a conclusion that Jacques could reach.
You must justify your answer.

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(2)

(Total for question = 4 marks)

Q2.

There are 11 727 students at a university.
Their nationality is classified as UK, EU or International.

The table shows information about the nationality of these students.

Nationality	UK	EU	International	Total
Number of students	9393	979	1355	11 727

(Source: *www.ox.ac.uk*)

The manager of a book shop wants to carry out a survey into the books read by the students at this university.

She is going to take a sample of 600 of these students.

The manager plans to sample 200 UK students, 200 EU students and 200 International students.

(a) Write down the name of this method of sampling.

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(1)

(b) Give a reason why this method of sampling might **not** be appropriate.

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(1)

A shop assistant suggests that it would be better to select a sample of 600 students, stratified by nationality.

(c) Work out how many EU students there should be in this sample.

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(2)

Three students, Amy, Beth and Carlos, bought the same eight books from the book shop.

The manager asked Amy, Beth and Carlos to rank these eight books in increasing order of how much they each enjoyed them.

The manager calculated the Spearman's rank correlation coefficient for the ranks given by Amy and Beth.

She got a result of 1.2

(d) Explain how you know that this result is not correct.

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(1)

The manager also calculated the Spearman's rank correlation coefficient for the ranks given by Beth and Carlos.

She got a result of 0.74

(e) (i) What type of correlation is shown by this result?

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(ii) Interpret this result.

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(2)

(Total for question = 7 marks)

Q3.

Answer the question with a cross in the box you think is correct ☒ . If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒ .

Raina has been watching the judging of a cake baking competition.

Two judges ranked the 10 bakers for their sponge cakes.

Raina calculated the Spearman's rank correlation coefficient for the ranks given by the judges.

She got a value of 0.8

(a) (i) What type of correlation is shown by the value 0.8?

Put a cross in one of the boxes below.

Negative correlation ☐ No correlation ☐ Positive correlation ☐

(ii) Interpret Raina's value.

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(2)

The same two judges will also be judging a flower-arranging competition.

(b) Is it possible to say anything about the ranks they are likely to give for flower arranging based on the value of Spearman's rank correlation coefficient that Raina calculated?

Give a reason for your answer.

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(1)

(Total for question = 3 marks)