FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

S5: Describing a population

Use and interpret statistics from samples to describe a population

20 marks · 25 minutes · Calculator allowed

1) A sample of 20 apples has a mean mass of 152 g. Explain why the mean mass of all the apples may be different.

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[Question 1: 2 marks]

2) A sample of households has a mean of 2.8 people each. Show that an estimate for 400 households is 1120 people.

[Question 2: 2 marks]

3) In a sample of 300 people, 45 own an electric car. Show that about 3600 of a town's 24 000 people own one.

[Question 3: 2 marks]

4) Sample A of journey times has mean 25 minutes and range 30 minutes. Sample B has mean 32 minutes and range 12 minutes. Compare the samples in context.

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[Question 4: 2 marks]

5) Explain why a sample of 20 might not represent the whole population.

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[Question 5: 2 marks]

6) Explain what "the average household has 2.4 people" means.

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[Question 6: 1 marks]

7) Which average best describes house prices in an area with a few very expensive houses? Explain.

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[Question 7: 2 marks]

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8) A sample of 50 bulbs has a mean life of 1000 hours. Ben says every bulb lasts 1000 hours. Explain his mistake.

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[Question 8: 2 marks]

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9) 50 fish are tagged. Later, 12 of 60 fish caught are tagged. Show that there are about 250 fish and give one assumption.

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[Question 9: 2 marks]

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10) Explain why different samples from the same population have different means.

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[Question 10: 1 marks]

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11) Show that the median of 34, 41, 38, 45, 29, 41, 36, 40 is 39 and explain what it tells you.

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[Question 11: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Explanation	Sample is small (C1); results vary (C1).
2	Shown	2.8×400 (C1, C1).
3	Shown	$\frac{45}{300} = 0.15$ (M1); C1.
4	Explanation	A is quicker on average (C1); A varies more (C1).
5	Explanation	Small samples may contain unusual values (C2).
6	Explanation	It is the mean; no household has exactly 2.4 (C1).
7	Median	Not affected by a few extreme prices (C2).
8	Explanation	Mean is an average; individual bulbs vary (C2).
9	250	$\frac{12}{60} = \frac{50}{N}$ (M1); e.g. tagged fish mix evenly (C1).
10	Explanation	Each sample contains different individuals (C1).
11	Shown	Ordered: 29, 34, 36, 38, 40, 41, 41, 45 (M1); half the weeks above and half below 39 (C1).