FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

S1: Sampling

Reason about populations, samples and bias

20 marks · 25 minutes · Non-calculator

1) A survey asks people at a football match for their favourite sport. Explain why the sample is biased.

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[Question 1: 2 marks]

2) Explain the difference between a population and a sample.

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[Question 2: 2 marks]

3) Ben asks his 5 friends to find out what the whole school thinks. Explain two limitations of his sample.

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[Question 3: 2 marks]

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4) 40 fish are tagged and released. Later 50 fish are caught and 8 are tagged. Show that there are about 250 fish and state one assumption.

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[Question 4: 3 marks]

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5) Explain why choosing a random sample reduces bias.

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[Question 5: 2 marks]

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6) Explain why a larger sample is usually more reliable.

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[Question 6: 2 marks]

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7) In a sample of 100 students, 35 like a new canteen menu. Kim says exactly 35% of the school likes it. Explain her mistake.

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[Question 7: 2 marks]

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8) A school has 200 Year 10 and 300 Year 11 students. A sample of 50 includes 20 from Year 10 and 30 from Year 11. Show this is in proportion and explain why this is fair.

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[Question 8: 2 marks]

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9) Explain when a census might be better than a sample.

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[Question 9: 1 marks]

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10) A survey asks "Don't you agree that the new park is great?" Explain why this question may cause bias.

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[Question 10: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Explanation	Football fans are more likely to choose football (C2).
2	Explanation	Population: the whole group (C1); sample: part of it (C1).
3	Explanation	Too small (C1); not representative / friends think alike (C1).
4	250	$\frac{8}{50} = \frac{40}{N}$ (M1); 250 (A1); e.g. fish mix fully / no fish die (C1).
5	Explanation	Everyone has an equal chance of selection (C2).
6	Explanation	Less affected by unusual individuals (C2).
7	Explanation	A sample only gives an estimate (C2).
8	Shown	$\frac{200}{500} \times 50 = 20$ (M1); each group fairly represented (C1).
9	Explanation	When the population is small or every value matters (C1).
10	Explanation	Leading question encourages a particular answer (C2).