FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

S1: Sampling

Populations and samples; limitations of sampling

20 marks · 25 minutes · Non-calculator

1) (a) What is meant by a *population* in statistics?

.....

(1)

(b) What is meant by a *sample*?

.....

(1)

[Question 1: 2 marks]

2) Give one reason for using a sample rather than the whole population.

.....

[Question 2: 1 marks]

3) Describe how to choose a random sample of 50 students from a school of 1000 students.

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[Question 3: 1 marks]

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4) A survey about how often people exercise is carried out only at a gym. Explain why the sample is biased.

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[Question 4: 1 marks]

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5) 30 fish are caught in a lake, tagged and released. Later, 40 fish are caught and 6 of them are tagged. Estimate the number of fish in the lake.

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[Question 5: 2 marks]

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6) In a random sample of 80 students, 28 prefer pizza. Estimate how many of the 1200 students in the school prefer pizza.

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[Question 6: 2 marks]

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7) A school has 240 students in Year 10 and 360 in Year 11. A sample of 50 students is taken in proportion to the size of each year group.

(a) How many Year 10 students should be in the sample?

.....

(2)

(b) How many Year 11 students should be in the sample?

.....

(1)

[Question 7: 3 marks]

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8) True or false: a larger random sample is usually more reliable.

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[Question 8: 1 marks]

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9) Which is better: a random sample of 10 people or a random sample of 100 people?

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[Question 9: 1 marks]

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10) The mean height of a random sample of 50 students is 1.62 m. Estimate the mean height of all students in the school.

..... m

[Question 10: 1 marks]

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11) A teacher surveys only her own class to find out the views of the whole school. Give one limitation of this sample.

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[Question 11: 1 marks]

12) A survey asks the first 20 people who arrive at school at 7:30 am. Give a reason why the sample may be biased.

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[Question 12: 1 marks]

13) In a sample of 200 bulbs, 6 are faulty. Estimate the number of faulty bulbs in a batch of 5000.

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[Question 13: 2 marks]

14) What is a *census*?

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[Question 14: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	(a) The whole group being studied (b) A part of the population	B1 each.
2	e.g. cheaper or quicker	B1.
3	e.g. number the students and use a random number generator	B1.
4	People at a gym exercise more than most people	B1.
5	200	$\frac{6}{40} = \frac{30}{N}$ (M1); A1.
6	420	$\frac{28}{80} \times 1200$ (M1); A1.
7	(a) 20 (b) 30	(a) $\frac{240}{600} \times 50$ (M1); A1. (b) B1.
8	True	B1.
9	100	B1.
10	1.62	B1.
11	e.g. one class may not represent the whole school	B1.
12	e.g. only early arrivers are included	B1.
13	150	$\frac{6}{200} \times 5000$ (M1); A1.
14	A survey of the whole population	B1.