1.3 Stratified Sampling (Foundation): 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 There are 100 books on a library shelf, numbered 1 to 100. A systematic sample of 10 is to be taken.

(a) Work out the interval between selected items.

(b) The first item is chosen at random from the first interval and is number 1. Write down the next two numbers selected.

(c) Write down the last number selected.

(Total for Question 1 is 4 marks)

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2 A stratified sample is taken from 150 staff. There are 60 cleaners in the population, and 24 cleaners are in the sample.

(a) Work out the sampling fraction in its simplest form.

(b) Work out the total size of the sample.

(Total for Question 2 is 4 marks)

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3 A survey of 150 customers uses a stratified sample of 20. The numbers in each group are in the table.

Group	Number
students	30
adults	30
pensioners	60
children	30

Work out how many should be sampled from each group.

(Total for Question 3 is 3 marks)

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4 A teacher numbers 40 books on a library shelf from 1 to 40 and wants a simple random sample of 4. Using the list of two-digit random numbers below, reading from the left, select the sample. Ignore numbers that are not between 1 and 40 and ignore repeats.

10 80 38 15 33 28 79 77 41 62 84 85

(a) Write down the numbers selected.
(b) Why must repeats be ignored?

(Total for Question 4 is 3 marks)

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5 A survey of 200 club members uses a stratified sample of 60. The numbers in each group are in the table.

Group	Number
juniors	20
seniors	50
veterans	30
guests	100

Work out how many should be sampled from each group.

(Total for Question 5 is 3 marks)

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6 A survey of 400 farm animals uses a stratified sample of 50. The numbers in each group are in the table.

Group	Number
cows	80
sheep	200
pigs	120

Work out how many should be sampled from each group.

(Total for Question 6 is 3 marks)

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7 A teacher numbers 60 employees in a factory from 1 to 60 and wants a simple random sample of 4. Using the list of two-digit random numbers below, reading from the left, select the sample. Ignore numbers that are not between 1 and 60 and ignore repeats.

43 92 55 74 92 56 73 11 69 86 74 64

(a) Write down the numbers selected.
(b) Why must repeats be ignored?

(Total for Question 7 is 3 marks)

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8 A stratified sample is taken from 200 club members. There are 80 veterans in the population, and 24 veterans are in the sample.
(a) Work out the sampling fraction in its simplest form.
(b) Work out the total size of the sample.

(Total for Question 8 is 4 marks)

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9 A survey of 400 customers uses a stratified sample of 100. The numbers in each group are in the table.

Group	Number
students	60
adults	80
pensioners	60
children	200

Work out how many should be sampled from each group.

(Total for Question 9 is 3 marks)

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10 A teacher numbers 90 students in a year group from 1 to 90 and wants a simple random sample of 5. Using the list of two-digit random numbers below, reading from the left, select the sample. Ignore numbers that are not between 1 and 90 and ignore repeats.

49 60 27 49 56 7 62 84 26 61 70 22

(a) Write down the numbers selected.
(b) Why must repeats be ignored?

(Total for Question 10 is 3 marks)

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11 A survey of 400 staff uses a stratified sample of 40. The numbers in each group are in the table.

Group	Number
teachers	80
technicians	120
administrators	200

Work out how many should be sampled from each group.

(Total for Question 11 is 3 marks)

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12 A survey of 300 farm animals uses a stratified sample of 60. The numbers in each group are in the table.

Group	Number
cows	80
sheep	50
pigs	150
goats	20

Work out how many should be sampled from each group.

(Total for Question 12 is 3 marks)

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13 There are 120 employees in a factory, numbered 1 to 120. A systematic sample of 15 is to be taken.

(a) Work out the interval between selected items.

(b) The first item is chosen at random from the first interval and is number 5. Write down the next two numbers selected.

(c) Write down the last number selected.

(Total for Question 13 is 4 marks)

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14 A survey of 160 students uses a stratified sample of 40. The numbers in each group are in the table.

Group	Number
Year 7	40
Year 8	60
Year 9	60

Work out how many should be sampled from each group.

(Total for Question 14 is 3 marks)

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15 A stratified sample is taken from 200 customers. There are 40 children in the population, and 6 children are in the sample.

(a) Work out the sampling fraction in its simplest form.

(b) Work out the total size of the sample.

(Total for Question 15 is 4 marks)

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16 A teacher numbers 80 students in a year group from 1 to 80 and wants a simple random sample of 5. Using the list of two-digit random numbers below, reading from the left, select the sample. Ignore numbers that are not between 1 and 80 and ignore repeats.

31 10 36 16 40 2 61 65 95 85 89 71

(a) Write down the numbers selected.

(b) Why must repeats be ignored?

(Total for Question 16 is 3 marks)

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17 A survey of 500 students uses a stratified sample of 50. The numbers in each group are in the table.

Group	Number
Year 7	150
Year 8	100
Year 9	50
Year 10	200

Work out how many should be sampled from each group.

(Total for Question 17 is 3 marks)

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18 A stratified sample is taken from 200 customers. There are 100 children in the population, and 50 children are in the sample.

(a) Work out the sampling fraction in its simplest form.

(b) Work out the total size of the sample.

(Total for Question 18 is 4 marks)

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Mark scheme · 1.3 Stratified Sampling (Foundation): 1-hour Pack

Question 1

100 / 10	**M1**
10 cao	**A1**
11 and 21	**B1**
91 cao	**B1**

Answer: (a) 10; (b) 11, 21; (c) 91

Question 2

24/60	**M1**
2/5 oe	**A1**
150 x 2/5	**M1**
60 cao	**A1**

Answer: (a) 2/5; (b) 60

Question 3

sample size / population = 20/150	**M1**
group size x sampling fraction for at least one group	**M1**
4, 4, 8, 4 cao	**A1**

Answer: 4, 4, 8, 4

Question 4

ignores numbers over 40, 0 and repeats	**M1**
10, 38, 15, 33 cao	**A1**
so each item can only be chosen once (no item is selected twice)	**B1**

Answer: (a) 10, 38, 15, 33; (b) each item can only be selected once

Question 5

sample size / population = 60/200	**M1**
group size x sampling fraction for at least one group	**M1**
6, 15, 9, 30 cao	**A1**

Answer: 6, 15, 9, 30

Question 6

sample size / population = 50/400	**M1**
group size x sampling fraction for at least one group	**M1**
10, 25, 15 cao	**A1**

Answer: 10, 25, 15

Question 7

ignores numbers over 60, 0 and repeats	**M1**
43, 55, 56, 11 cao	**A1**
so each item can only be chosen once (no item is selected twice)	**B1**

Answer: (a) 43, 55, 56, 11; (b) each item can only be selected once

Question 8

24/80	**M1**
3/10 oe	**A1**
200 x 3/10	**M1**
60 cao	**A1**

Answer: (a) 3/10; (b) 60

Question 9

sample size / population = 100/400	**M1**
group size x sampling fraction for at least one group	**M1**
15, 20, 15, 50 cao	**A1**

Answer: 15, 20, 15, 50

Question 10

ignores numbers over 90, 0 and repeats	**M1**
49, 60, 27, 56, 7 cao	**A1**
so each item can only be chosen once (no item is selected twice)	**B1**

Answer: (a) 49, 60, 27, 56, 7; (b) each item can only be selected once

Question 11

sample size / population = 40/400	**M1**
group size x sampling fraction for at least one group	**M1**
8, 12, 20 cao	**A1**

Answer: 8, 12, 20

Question 12

sample size / population = 60/300	**M1**
group size x sampling fraction for at least one group	**M1**
16, 10, 30, 4 cao	**A1**

Answer: 16, 10, 30, 4

Question 13

120 / 15	**M1**
8 cao	**A1**
13 and 21	**B1**
117 cao	**B1**

Answer: (a) 8; (b) 13, 21; (c) 117

Question 14

sample size / population = 40/160	**M1**
group size x sampling fraction for at least one group	**M1**
10, 15, 15 cao	**A1**

Answer: 10, 15, 15

Question 15

6/40	**M1**
3/20 oe	**A1**
200 x 3/20	**M1**
30 cao	**A1**

Answer: (a) 3/20; (b) 30

Question 16

ignores numbers over 80, 0 and repeats	**M1**
31, 10, 36, 16, 40 cao	**A1**
so each item can only be chosen once (no item is selected twice)	**B1**

Answer: (a) 31, 10, 36, 16, 40; (b) each item can only be selected once

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Question 17

sample size / population = 50/500	**M1**
group size x sampling fraction for at least one group	**M1**
15, 10, 5, 20 cao	**A1**

Answer: 15, 10, 5, 20

Question 18

50/100	**M1**
1/2 oe	**A1**
200 x 1/2	**M1**
100 cao	**A1**

Answer: (a) 1/2; (b) 100

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