HIGHER

1.5 Stratified Sampling (Higher): 1-hour Pack

Total Marks

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A survey of 300 customers uses a stratified sample of 25. The numbers in each group are in the table.

Group	Number
students	60
adults	120
pensioners	60
children	60

Work out how many should be sampled from each group.

(Total for Question 1 is 3 marks)

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2 A random sample of 100 residents of a town was taken. 3 of them have a library card. There are 3000 residents of the town altogether. Estimate the number of residents of the town who have a library card. Give your answer to the nearest whole number.

(Total for Question 2 is 3 marks)

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

Group	Number
students	100
adults	200
pensioners	20
children	80

Work out how many should be sampled from each group.

(Total for Question 3 is 3 marks)

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4 A survey of 150 staff uses a stratified sample of 30. The numbers in each group are in the table.

Group	Number
teachers	20
technicians	50
administrators	80

Work out how many should be sampled from each group.

(Total for Question 4 is 3 marks)

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5 Two surveys estimate the proportion of members of a gym who cycle. Survey A: 3 of 20 cycle. Survey B: 12 of 100 cycle.

(a) Work out the proportion who cycle in each survey as a percentage, to 1 decimal place if needed.

(b) Which survey is likely to give the more reliable estimate, and why?

(Total for Question 5 is 4 marks)

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6 A survey of 150 club members uses a stratified sample of 100. The numbers in each group are in the table.

Group	Number
juniors	30
seniors	60
veterans	30
guests	30

Work out how many should be sampled from each group.

(Total for Question 6 is 3 marks)

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7 A stratified sample is taken from 160 club members. There are 40 seniors in the population, and 10 seniors 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 7 is 4 marks)

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8 A random sample of 50 members of a gym was taken. 13 of them read a paper. There are 5000 members of the gym altogether. Estimate the number of members of the gym who read a paper. Give your answer to the nearest whole number.

(Total for Question 8 is 3 marks)

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9 A survey of 250 staff uses a stratified sample of 100. The numbers in each group are in the table.

Group	Number
teachers	150
technicians	40
administrators	60

Work out how many should be sampled from each group.

(Total for Question 9 is 3 marks)

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10 A stratified sample is taken from 400 students. There are 40 Year 10 in the population, and 6 Year 10 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 10 is 4 marks)

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11 A survey of 150 staff uses a stratified sample of 30. The numbers in each group are in the table.

Group	Number
teachers	50
technicians	30
administrators	20
cleaners	50

Work out how many should be sampled from each group.

(Total for Question 11 is 3 marks)

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12 A stratified sample is taken from 300 club members. There are 120 seniors in the population, and 10 seniors 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 12 is 4 marks)

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13 A random sample of 40 members of a gym was taken. 14 of them have a library card. There are 2000 members of the gym altogether. Estimate the number of members of the gym who have a library card. Give your answer to the nearest whole number.

(Total for Question 13 is 3 marks)

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14 A survey of 500 customers uses a stratified sample of 30. The numbers in each group are in the table.

Group	Number
students	150
adults	200
pensioners	150

Work out how many should be sampled from each group.

(Total for Question 14 is 3 marks)

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15 A survey of 200 customers uses a stratified sample of 40. The numbers in each group are in the table.

Group	Number
students	150
adults	20
pensioners	30

Work out how many should be sampled from each group.

(Total for Question 15 is 3 marks)

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16 A random sample of 40 of the 1000 parcels sent by a firm last week had a mean mass of 88 kg. Estimate the total mass of all 1000 parcels.

(Total for Question 16 is 2 marks)

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17 A survey of 250 staff uses a stratified sample of 25. The numbers in each group are in the table.

Group	Number
teachers	30
technicians	100
administrators	120

Work out how many should be sampled from each group.

(Total for Question 17 is 3 marks)

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18 A survey of 200 staff uses a stratified sample of 30. The numbers in each group are in the table.

Group	Number
teachers	20
technicians	80
administrators	100

Work out how many should be sampled from each group.

(Total for Question 18 is 3 marks)

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Mark scheme · 1.5 Stratified Sampling (Higher): 1-hour Pack

Question 1

sample size / population = 25/300	**M1**
group size x sampling fraction for at least one group	**M1**
5, 10, 5, 5 cao	**A1**

Answer: 5, 10, 5, 5

Question 2

3/100	**M1**
3/100 x 3000	**M1**
90 cao	**A1**

Answer: 90

Question 3

sample size / population = 100/400	**M1**
group size x sampling fraction for at least one group	**M1**
25, 50, 5, 20 cao	**A1**

Answer: 25, 50, 5, 20

Question 4

sample size / population = 30/150	**M1**
group size x sampling fraction for at least one group	**M1**
4, 10, 16 cao	**A1**

Answer: 4, 10, 16

Question 5

3/20 x 100 or 12/100 x 100	**M1**
15% and 12% cao	**A1**
Survey B	**B1**
it has a larger sample (100 compared with 20)	**B1**

Answer: (a) 15% and 12%; (b) Survey B, larger sample

Question 6

sample size / population = 100/150	**M1**
group size x sampling fraction for at least one group	**M1**
20, 40, 20, 20 cao	**A1**

Answer: 20, 40, 20, 20

Question 7

10/40	**M1**
1/4 oe	**A1**
160 x 1/4	**M1**
40 cao	**A1**

Answer: (a) 1/4; (b) 40

Question 8

13/50	**M1**
13/50 x 5000	**M1**
1300 cao	**A1**

Answer: 1300

Question 9

sample size / population = 100/250	**M1**
group size x sampling fraction for at least one group	**M1**
60, 16, 24 cao	**A1**

Answer: 60, 16, 24

Question 10

6/40	**M1**
3/20 oe	**A1**
400 x 3/20	**M1**
60 cao	**A1**

Answer: (a) 3/20; (b) 60

Question 11

sample size / population = 30/150	**M1**
group size x sampling fraction for at least one group	**M1**
10, 6, 4, 10 cao	**A1**

Answer: 10, 6, 4, 10

Question 12

10/120	**M1**
1/12 oe	**A1**
300 x 1/12	**M1**
25 cao	**A1**

Answer: (a) 1/12; (b) 25

Question 13

14/40	**M1**
7/20 x 2000	**M1**
700 cao	**A1**

Answer: 700

Question 14

sample size / population = 30/500	**M1**
group size x sampling fraction for at least one group	**M1**
9, 12, 9 cao	**A1**

Answer: 9, 12, 9

Question 15

sample size / population = 40/200	**M1**
group size x sampling fraction for at least one group	**M1**
30, 4, 6 cao	**A1**

Answer: 30, 4, 6

Question 16

1000 x 88	**M1**
88000 kg cao	**A1**

Answer: 88000 kg

Question 17

sample size / population = 25/250	**M1**
group size x sampling fraction for at least one group	**M1**
3, 10, 12 cao	**A1**

Answer: 3, 10, 12

Question 18

sample size / population = 30/200	**M1**
group size x sampling fraction for at least one group	**M1**
3, 12, 15 cao	**A1**

Answer: 3, 12, 15

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