

Statistics GCSE

Paper 2

2025

Edexcel Higher

Variant 3

1ST0/1H

Mark scheme

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Question	Mark Scheme	Mark
1 (a)	[1 mark each] for any two from: + There may be repeated random numbers + Random numbers may not correspond to students' numbers + Selected people may not want to participate + Some people may have left the sports club	2

Question 1 (a) model answer

Some of the random numbers may be repeated.

The selected person may not want to participate.

Question	Mark Scheme	Mark
1 (b)	[1 mark each] for any two from: + Simple, convenient, fast, efficient, or cost-effective + Reflects population or proportion + Enables comparison between male and female + Does not require a sampling frame	2

Question 1 (b) model answer

Quota sampling is quick and allows for comparison between male and female members.

Question	Mark Scheme	Mark
1 (c)	[1 mark] One from: + Not all people have an equal chance of being selected. + Only people at the club that day are considered. + The people are being picked by Marcus	1

Question 1 (c) model answer

Marcus is picking the people.

Question	Mark Scheme	Mark
2 (a)	[1 mark] 4.1% to 6.0% increase	1

Question	Mark Scheme	Mark
2 (b)	[1 mark] 1	1

Question	Mark Scheme	Mark
2 (c)	[1 mark] Explanation that shows an understanding that we have percentages not numbers.	1

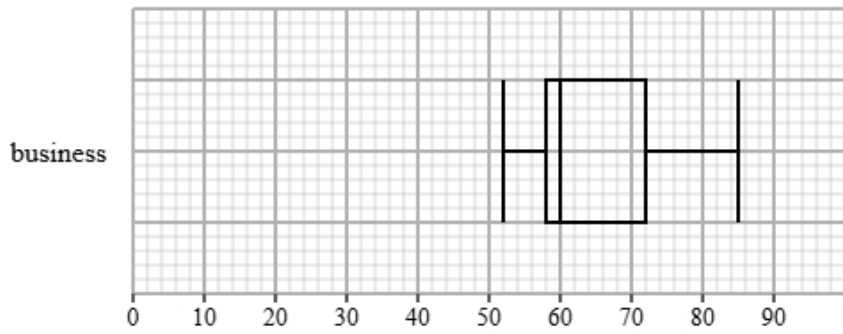
Question 2 (c) model answer

The map does not show the increases and decreases as amounts.

Question	Mark Scheme	Mark
2 (d)	[1 mark] choropleth (map)	1

Question	Mark Scheme	Mark
3 (a)	[1 mark] A box with two whiskers drawn with at least 3 correct values [1 mark] Fully correct	2

Question 3 (a) model answer



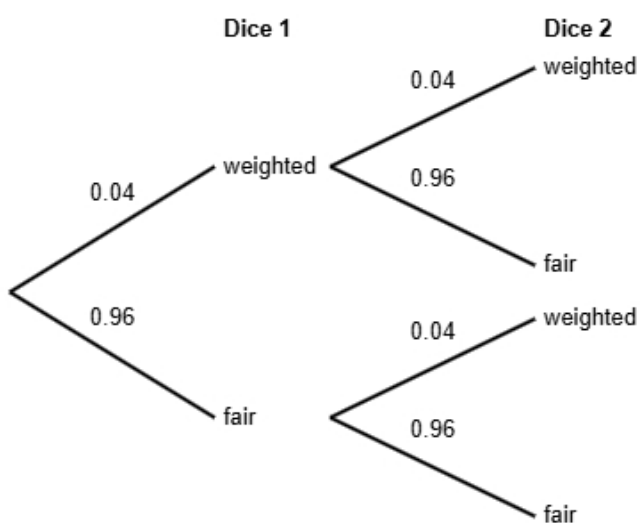
Question	Mark Scheme	Mark
3 (b)	[1 mark] Correct comparison of the medians [1 mark] Correct comparison of the IQR/range [1 mark] Correct comparison of the skews [1 mark] Correct contextual interpretation comparing medians or IQR/ranges or skew	4

Question 3 (b) model answer

The median marks for physics students is greater than business students. The IQR for the marks of the physics students is greater than business students. The skew for the marks of the physics students is symmetrical and the skew for the business students is positive. The physics students are on average did better on the statistics test than the business students.

Question	Mark Scheme	Mark
4 (a)	[1 mark] 0.96 in correct position for Dice 1. [1 mark] 0.04, 0.96, 0.04 and 0.96 in correct positions for Dice 2.	2

Question 4 (a) model answer



Question	Mark Scheme	Mark
4 (b)	[1 mark] 0.9216	2

Question	Mark Scheme	Mark
4 (c)	[1 mark] for one correct product using their '0.96' or subtracting a not-wanted product from 1 [1 mark] for 0.0768 or 7.68% [1 mark] for 'correct' ft probability and conclusion based on their probability	3

Question 4 (c) model answer

$$\begin{aligned}
 P(\text{weighted AND fair}) &= 0.04 \times 0.96 \\
 &= 0.0384 \\
 P(\text{exactly one dice is weighted}) &= 0.0384 \times 2 \\
 &= 0.0768 \\
 0.0768 &= 7.68\% \\
 7.68\% &< 8\%
 \end{aligned}$$

The probability that exactly one dice is weighted is less than 8%, so Jack is correct.

Question	Mark Scheme	Mark
5 (a)	[1 mark] for correct comment on the type of data, such as discrete, whole numbers, integers, etc.	1

Question 5 (a) model answer

Because number of power outages recorded in a small town is discrete.

Question	Mark Scheme	Mark
5 (b)	[1 mark] 2	1

Question	Mark Scheme	Mark
5 (c)	<p>Part i [1 mark] 0</p> <p>Part ii [1 mark] Subtracts 25 from 50. [1 mark] 25</p>	3

Question	Mark Scheme	Mark
5 (d)	[1 mark] 6	1

Question	Mark Scheme	Mark
5 (e)	[1 mark] for a correct reason	1

Question 5 (e) model answer

The range is 6, so the IQR must be less than 6.

Question	Mark Scheme	Mark
6 (a)	[1 mark] A and C [1 mark] no intersection/overlap	2

Question 6 (a) model answer

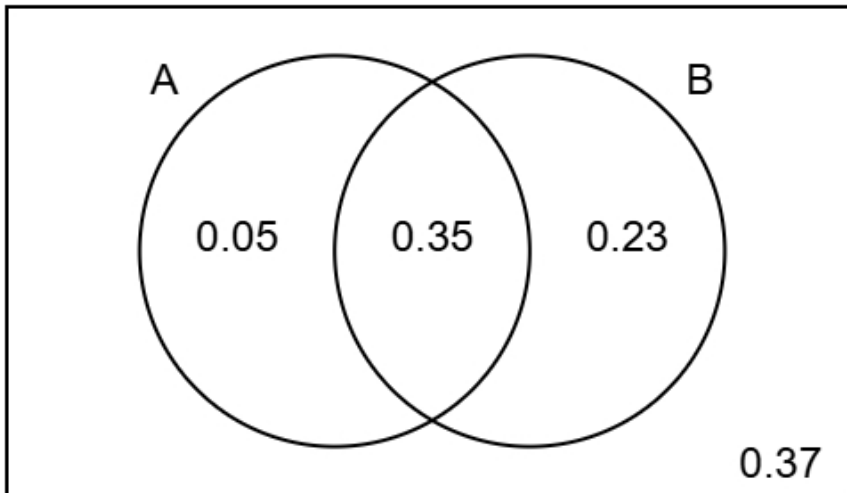
A and C are mutually exclusive because they do not intersect.

Question	Mark Scheme	Mark
6 (b)	[1 mark] 0.58	1

Question	Mark Scheme	Mark
6 (c)	[1 mark] $P(A \text{ or } C) = P(A) + P(C)$ or $(0.05 + 0.35) + (0.06 + 0.24)$ [1 mark] 0.7	2

Question	Mark Scheme	Mark
6 (d)	[1 mark] 0.05 and 0.35 in the correct places. [1 mark] 0.23 and 0.37 in the correct places.	2

Question 6 (d) model answer



Question	Mark Scheme	Mark
7 (a)	[1 mark] Scatter diagram	1

Question	Mark Scheme	Mark
7 (b)	[1 mark] Finding d^2 [1 mark] $1 - \frac{6 \times 19}{10(10^2 - 1)}$ [1 mark] 0.88 [1 mark] As customer ratings increases, critic ratings increases. [1 mark] The presence of outliers would decrease the correlation.	5

Question	Mark Scheme	Mark
7 (c)	[1 mark] PMCC measures linear correlation [1 mark] Spearman's rank correlation is used for ranked/ordinal data [1 mark] Aiden should not use PMCC or should use Spearman's rank correlation	3

Question 7 (c) model answer

Aiden should not use PMCC because the PMCC only measures linear correlation and Spearman's rank correlation is used for ranked data.

Question	Mark Scheme	Mark
8 (a)	[1 mark] the pie charts do not show the total budget amount or pie charts only show proportions, not amounts.	1

Question 8 (a) model answer

Summer could have had a larger total budget than Winter.

Question	Mark Scheme	Mark
8 (b)	[1 mark] $\frac{224.735}{35} \times 15$ [1 mark] 96.315 kWh	2

Question	Mark Scheme	Mark
8 (c)	<p>[1 mark] Comparative pie charts (or a description of them)</p> <p>[2 marks] A calculation to find the radius of one pie chart from the other. For example, $\sqrt{\frac{830}{640}} = 1.14$ x Summer will give the radius for Winter.</p> <p>OR</p> <p>[1 mark] The radii of the pie charts will be in proportion to the square root of the ratio of the totals.</p> <p>[1 mark] The areas will represent the totals. This mark can be award from an example.</p> <p>[1 mark] The proportions/percentages will be the same.</p>	5

Question 8 (c) model answer

Liam can use comparative pie charts.

$$\sqrt{\frac{830}{640}} = 1.14$$

The radius of the November 2015 pie chart will be 1.14 larger than the February 2016 pie chart.

Since the pie charts have varying totals, their overall sizes will correspond to those totals while keeping the proportions the same.

Question	Mark Scheme	Mark
9 (a)	<p>[2 marks] 34.4</p> <p>OR</p> <p>[1 mark] $32 + 3 \times 0.8$</p>	2

Question	Mark Scheme	Mark
9 (b)	[1 mark] Stoppage/resets in production process more frequently.	1

Question 9 (b) model answer

The production process would reset more frequently.

Question	Mark Scheme	Mark
9 (c)	[1 mark] The process can continue because the range is within the upper warning limit [1 mark] The mean is within the upper warning limit	2

Question 9 (c) model answer

The production process should continue because the range is within the warning limit and the mean is within the upper warning limit.

Question	Mark Scheme	Mark
10 (a)	[1 mark] 137.5	1

Question	Mark Scheme	Mark
10 (b)	<p>[3 marks] 6.86</p> <p>OR</p> <p>[2 marks] $4.9 \times (1.1 - -0.3)$</p> <p>OR</p> <p>[1 mark] $(1.1 \times 4.9) + 137.5$ or 142.89</p> <p>[1 mark] $(-0.3 \times 4.9) + 137.5$ or 136.03</p>	3

Question 10 (b) model answer

$$\begin{aligned} \text{Amelia's height} &= (1.1 \times 4.9) + 137.5 \\ &= 142.89 \end{aligned}$$

$$\begin{aligned} \text{Ruby's height} &= (-0.3 \times 4.9) + 137.5 \\ &= 136.03 \end{aligned}$$

Difference

$$142.89 - 136.03 = 6.86$$

Question	Mark Scheme	Mark
10 (c)	Part i [2 marks] Appropriate and correct reason (such as sample mean will be close to the population mean) OR [1 mark] Correct reason Part ii [2 marks] Not appropriate and correct reason (such as sample mean will be more closely distributed than the individual values) OR [1 mark] Correct reason	4

Question 10 (c) model answer

Using 137.5 cm as the mean is appropriate because the sample mean will be close to the population mean.

Using 4.9 cm as the standard deviation is not appropriate because the sample mean will be more closely distributed than the individual values.

Question	Mark Scheme	Mark
11 (a)	[1 mark] Correct interpretation, but must be in context.	1

Question 11 (a) model answer

For each 1 mg increase in caffeine intake the reaction time would decrease by 0.15 ms.

Question	Mark Scheme	Mark
11 (b)	<p>[1 mark] Correct comparison of regression equations of all university students</p> <p>[1 mark] Correct comparison of regression equations between before exams and after exams</p> <p>[1 mark] Correct comparison of regression equations between male students and female students</p>	3

Question 11 (b) model answer

For all university students, an increase in caffeine intake led to a decrease in reaction time. As caffeine intake increased, the reaction time decreased more rapidly after exams compared to before exams. The reaction time of male students decreased more per mg of caffeine intake than female students.

Question	Mark Scheme	Mark
11 (c)	<p>Part i</p> <p>[1 mark] Would show a bell curve, symmetry or skew</p> <p>Part ii</p> <p>Max 2 marks</p> <p>[1 mark] All averages equal</p> <p>[1 mark] 68% data within 1 standard deviation, 95% within 2 standard deviations, almost all within 3 standard deviations</p> <p>[1 mark] Can calculate skewness with mean/median and standard deviation</p>	3

Question 11 (c) model answer

If the histogram is symmetrical, a normal distribution could be a suitable model.

If the mean, median and mode are equal and almost all of data is within 3 standard deviation from the mean, a normal distribution could be a suitable model.

Question	Mark Scheme	Mark
12 (a)	<p>Max 2 marks (only 1 mark if no context)</p> <p>[1 mark] The events are independent using context</p> <p>[1 mark] There are only two outcomes using context</p> <p>[1 mark] The probability remains constant using context</p>	2

Question 12 (a) model answer

Each of the emails are independent. The chance of getting a defective lightbulb remains constant.

Question	Mark Scheme	Mark
12 (b)	<p>[2 marks] $\frac{1}{8000}$</p> <p>OR</p> <p>[1 mark] $\left(\frac{5}{100}\right)^3$</p>	2

Question 12 (b) model answer

$$\left(\frac{5}{100}\right)^3 = \frac{1}{8000}$$

Question	Mark Scheme	Mark
12 (c)	<p>[3 marks] $\frac{29}{4000}$</p> <p>OR</p> <p>[1 mark] Correctly finds a probability e.g. $P(X = 0)$</p> <p>[1 mark] Correct working for $P(X \geq 2)$</p>	3

Question 12 (c) model answer

$$\begin{aligned}
 P(X = 0) &= \left(\frac{95}{100}\right)^3 \\
 &= \frac{6859}{8000} \\
 P(X = 1) &= 3 \times \left(\frac{5}{100}\right) \times \left(\frac{95}{100}\right)^2 \\
 &= \frac{1083}{8000} \\
 P(X \geq 2) &= 1 - \left(\frac{6859}{8000} + \frac{1083}{8000}\right) \\
 &= \frac{29}{4000}
 \end{aligned}$$