Mark Scheme (Results)

Summer 2024

Pearson Edexcel GCSE (9 – 1)
In Statistics (1ST0)
Higher Paper 1H

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General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

1 All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.

Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

2 All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

Questions where working is not required: In general, the correct answer should be given full marks.
Questions that specifically require working: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

3 Crossed out work

This should be marked **unless** the candidate has replaced it with an alternative response.

4 Choice of method

If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

If no answer appears on the answer line then mark both methods **as far as they are identical** and award these marks.

5 Incorrect method

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.

6 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

7 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its

context. (eg an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg incorrect algebraic simplification).

8 Probability

Probability answers must be given as a fraction, percentage or decimal. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

9 Range of answers

Unless otherwise stated, when an answer is given as a range (eg 3.5 – 4.2) then this is inclusive of the end points (eg 3.5, 4.2) and all numbers within the range.

Guidance on the use of abbreviations within this mark scheme	
M	method mark awarded for a correct method or partial method
A	accuracy mark (awarded after a correct method; if no method is seen then full marks for the question are implied but see individual mark schemes for more details)
B	unconditional accuracy mark (no method needed)
oe	or equivalent
cao	correct answer only
ft	follow through (when appropriate as per mark scheme)
sc	special case
dep	dependent (on a previous mark)
indep	independent
awrt	answer which rounds to
isw	ignore subsequent working

Question number	Answer	Additional guidance
1(a)(i)	M1 $\frac{1.29}{34.04} \times 100(\%)$ A1 3.79	M1 for equivalent calculation A1 for awrt 3.79
(ii)	B1ft (The unemployment rate in the UK is) decreasing.	ft (i)
(b)	B2 for a correct decision and complete reason e.g. • Bob is correct as the total workforce **and** unemployment rate is lower in 2018 compared to 2017 (B1 for e.g. • Bob is correct as the total workforce is lower in 2018 compared to 2017 • Bob is correct as the unemployment rate is lower in 2018 compared to 2017 • the total workforce **and** unemployment rate is lower in 2018 with no conclusion or incorrect conclusion • Bob is correct with 1.48(044) million and 1.296(4) million)	B2 for a complete assessment of the claim together with reason (B1 for a complete reason and no or incorrect conclusion or for a correct decision with partial reason). Not 1.29 million (2019 figure)

Question number	Answer	Additional guidance
2(a)	M1 12 + 3 + 1 A1 16	M1 for $(199 + 17 + 12 + 3 + 1) - (199 + 17)$
(b)(i)	M1 for $25 \times 199 + 75 \times 17 + 125 \times 12 + 175 \times 3 + 225 \times 1$ M1 $\frac{25\times199+75\times17+125\times12+175\times3+225\times1}{199+17+12+3+1}$ (=36.6) A1 36.6	M1 for consistent use of $\sum fx$ with x within interval (including ends). Condone one incorrect. $\sum fx = 4975 + 1275 + 1500 + 525 + 225$ M1 for correct use of $\sum fx$ with x the mid-interval value (can be implied by 8500) divided by 232. Condone one incorrect mid-interval value. Working may be seen in table A1 for awrt 36.6
(ii)	B1 for any one from • Data is grouped / is in intervals • Use midpoint values • True values are not known	Accept equivalent wording but reference to rounding or it is an estimate is B0
(iii)	B1 for any one from • splitting the data into more groups/smaller widths for the groups. • use raw/ungrouped data • check the accuracy of measurements / use another source	Accept increase sample size / find more lengths. B0 for collect primary data.

(c)	B2 for appropriate and a correct reason e.g. • (continuous) grouped data • can show the distribution of lengths (B1 for e.g. grouped data with no / incorrect conclusion) OR B2 for not appropriate and a correct reason e.g. • poor class widths • variable frequencies / a lot more lengths in $0 \leq l < 50$ (B1 for poor class widths / large variation in frequencies with no / incorrect conclusion)	B2 for assessing the appropriateness of using a frequency polygon with consistent reason (B1 for a correct reason and no conclusion / incorrect conclusion) Ignore additional non-contradictory statements. Ignore reference to alternative diagrams.

Question number	Answer		Additional guidance
3	M1 3.2 + 3.4 = (6.6) or 3.3 + 3.5 = (6.8) A1 for 6.6 and 6.8	M1 for identifying (France) 3.2, 3.4 AND (Italy) 3.3, 3.5 A1 for $3.2 < 3.3$ AND $3.4 < 3.5$	M1 for attempt at finding either total percentage or for identifying all four required percentages A1 for both correct totals or for both correct comparisons.
	M1 for $0.034 \times 62\,444\,566$ = (2 123 115.244) or 0.041×59822450 = (2 452 720.45) A1 for 2 123 115 and 2 452 720		M1 for correct method for finding the number of males aged 40-44 in France or the number of males aged 40-44 in Italy A1 for both correct. Condone if not integers.
	dep B1ft Claim one is correct / the percentage of 50-54 is greater in Italy compared to France. **AND** claim two is incorrect / the number of males aged 40-44 is greater in Italy compared to France.		dep B1ft for accepting claim one and rejecting claim two. Dependent on M1M1.

Question number	Answer	Additional guidance
4(a)	B1 $20 < t \leq 25$ B1 12	Inequality symbols must be correct.
(b)	M1 $5 + \frac{3}{5} \times 25$ A1 20	M0 for $25 - 5$
(c)	B1 for identifying positive skew B1 for interpretation e.g. • times greater than the median are more spread out (than times less than the median). • more than half of the runners take less than the mean time to run 5km. • the mean time is greater than the median time. • the times are mainly at the lower end of the distribution.	B1 for identifying the correct skew B0 for positive correlation B1 for correct interpretation of skew Accept interpretation not in context e.g. the mean is greater than the median. Ignore additional non-statistical statements. B0 for an incorrect interpretation given.

Question number	Answer	Additional guidance
5(a)(i)	B1 Cluster	Accept cluster, convenience or opportunity.
(a)(ii)	B1B1 for e.g. • Biased / everyone on production line may have same opinions • Not random / not everyone has the same chance of being selected • Not representative / only asking in one area of the factory / other areas of factory not included / may not get information about some changes	B1 for each of two bullet points
(b)	e.g. B1 How many extra hours would you be willing to work each week? B1 ☐ 0 hours ☐ $0 < h \leq 6$ ☐ $< h \leq 10$ ☐ > 10	B1 for an unbiased question about length of time with a timescale. B1 for at least three non-overlapping options and exhaustive which include units in either answer boxes or question. Allow discrete answers. Allow 4+ for 4 and above or more than 4
(c)	B1B1 for e.g. • offer an incentive / prize draw / competition if returned. • give time to complete during workday / make it compulsory. • could have used a face-to-face interview **or** make questionnaire anonymous. • ensure questions are not personal / not leading / quick to answer / easy to understand.	B1 for each of two bullet points

(d)	B1 get a list of all the 60 employees / get a sample frame / number all the employees B1 sample every 10^{th} person (can be implied by e.g. 5, 15, 25) B1 use a random starting point between 1 and 10. OR B1 get a list of employees / get a sample frame B1 use a spreadsheet to randomise the order of names B1 pick every 10th person	Allow for random starting point between 1 and a number greater than 10 / no upper limit.
(e)	B1 for e.g. • questions can be explained • can ask follow-up questions / get more detailed answers / clarify answers	B0 for reference to increased number of responses. B0 for reference to feeling pressured / less likely to lie. Do not accept e.g. 'open responses can be used'.

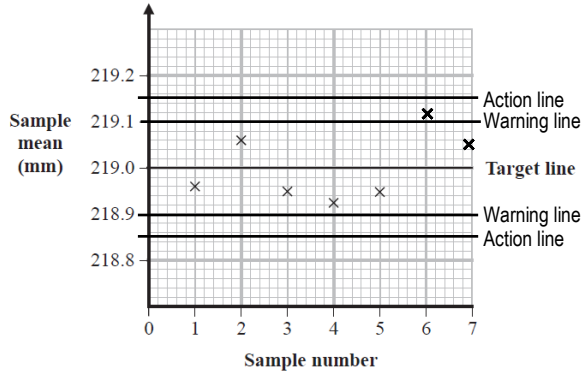
Question number	Answer	Additional guidance
6(a)	B2 for e.g. the number of visitors (to Canada) is increasing (over time). (B1 for increasing/upwards/positive/correct description of the trend with missing or incorrect contextual interpretation)	B2 for a correct description of the trend with contextual interpretation (B1 for increasing/correct description of the trend with missing or incorrect contextual interpretation) Allow rising. Do not allow **positive correlation** alone, but condone if accompanied by e.g. increasing / upwards trend. Ignore reference to figures.
(b)	B1B1 for correct descriptions of seasonal variation e.g. • lowest/least in Quarter 1 (each year) • greatest/highest in Quarter 3 (each year) depB1 for a correct interpretation in context for the identified seasonality e.g. • More visitors to Canada from UK in Quarter 3 / Summer • Fewer visitors to Canada from UK in Quarter 1 / Winter	B1 for each correct statement identifying seasonality Allow quarters to be identified by reference to correct season or months. Condone if quarter referenced and an incorrect attempt to interpret as a season / months. If more than one quarter commented on then ignore extra non-contradictory comments and interpretations. depB1 for a correct interpretation of seasonality identified.
(c)(i)	M1 $\frac{\pm(-50+-70+-85)}{3}$ A1 -68.3	Working may be seen on graph. Allow ±5 on each reading. Allow answers in the range -65 to -70 Working may be in thousands.
(ii)	B1ft e.g. on average quarter 1 has '68.3' (thousand) fewer visitors (compared to the trend).	B1 for a correct interpretation **in context**. Follow through their part (c)(i). Must be consistent with their (c)(i).

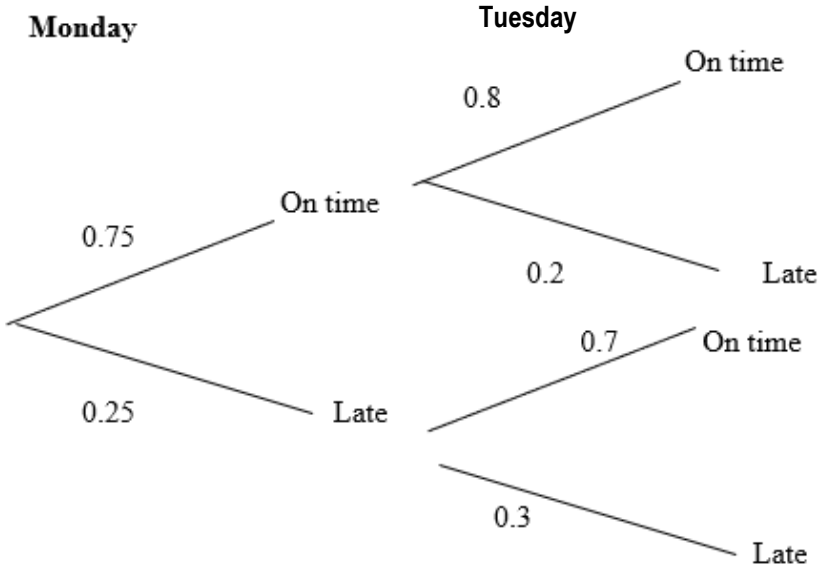
(d)(i)	M1 210 +'-68.3' A1ft 141.7	Working may be seen on graph. Working may be in thousands. Allow answers in the range 140 to 145 or correct ft for their (c)(i). Allow recovery from incorrect sign on mean seasonal variation in (c)(i) for M1 and A1. Answer without working scores M0A0.
(ii)	B2 May not be reliable plus one of • trend may not continue • extrapolation / outside range of data • seasonal variation may change. (B1 for not reliable with no reason or incorrect reason OR B1 for trend may not continue / extrapolation / outside range of data / seasonal variation may change)	B2 for correct conclusion with a correct reason. Condone e.g. it's not / not accurate for not reliable. (B1 for a correct conclusion with no reason or a correct reason with no conclusion) Do not accept: point is not on the graph / 2025 is not on the graph / we don't have data for 2025 as comments on their own. Condone if accompanied by a correct comment.

Quarters	**Months**	**Condone for season**
Quarter 1	January – March	Winter (Dec – Feb)
Quarter 2	April – June	Spring (March – May)
Quarter 3	July – September	Summer (June – August)
Quarter 4	October - December	Autumn (Sept – Nov)

Question number	Answer	Additional guidance
7(a)	B1 for e.g. • ONS is known to have quality assurance standards / data is checked • trustworthy source • collects large amounts of data	Accept e.g. government data. Accept e.g. data for everyone, data for whole country (implies large amounts of data) Do not accept e.g. reliable source (reliability asked in question), official data, national website on its own.
(b)	B1 as it is a question/should be a statement	
(c)	B1 pie charts appropriate as want to compare proportions (of brides in different age groups) / pie charts allow us to compare proportions (of brides in different age groups B2 Comparative pie charts more appropriate / better or Roberta correct plus a reason e.g. • as totals are different • more brides in 2003 (B1 for e.g. totals are different / more brides in 2003 with no conclusion or incorrect conclusion) OR B2 Comparative pie charts are not appropriate / not necessary or Andria plus reason • totals are similar (B1 for e.g. totals are similar with no conclusion or incorrect conclusion)	B1 for indicating a pie chart is appropriate together with a correct reason This may be as part of a comment on comparative pie charts. B2 for a decision on the appropriateness of comparative pie charts with a correct reason (B1 for a correct reason with no conclusion or incorrect conclusion) Note: indication that comparative pie charts are more appropriate may be e.g. 'Andria should use comparative pie charts' (as Andria originally planned only to use pie charts).
(d)	M1 $\frac{240\,822}{270\,109} = \frac{r^2}{16}$ OR $\sqrt{}(16\times 240822/270109)$ A1 3.78	M1 for a correct equation connecting the two radii or for a method to find the radius A1 awrt 3.78

(e)	B1 any one from • percentages (for each category) • total number of brides for each year • number of brides for each category • (relative) areas of pie charts represents the total population size	Accept population size / total frequency. Do not accept: label the years, ages of brides or angles alone. Ignore additional non-contradictory statements.

Question number	Answer	Additional guidance
8(a)	B2 for a correct conclusion and reason • the sample means are more consistent as the standard deviation is smaller o.e (B1 for a correct conclusion with no reason or incorrect reason e.g. • the sample means are more consistent OR B1 for an incorrect conclusion/no conclusion and a correct reason e.g. • the sample means have a smaller standard deviation)	B2 for a correct conclusion and reason (B1 for a correct reason and no conclusion or a correct conclusion with no reason or incorrect reason) Small standard deviation is not acceptable for a reason. We need to see smaller oe.
(b)	B2 for two correctly plotted points at (6, 219.12) and (7, 219.05) (B1 for one correctly plotted)	
(c)	B1 warning line(s) at 219.1 or 218.9 and labelled B1 action line(s) at 219.15 or 218.85 and labelled B1 all four lines correct and labelled  B1ft sample 6 is in between warning and action so another sample taken straight away B1ft sample 7 is within warning lines so machine can continue	If lines are not labelled, then SCB2 for **all four** correct lines unlabelled. ft on their warning line(s) and action line(s) and their plotted points. Must have an attempt at, or full explanation of, both warning line(s) and action line(s), but not necessarily labelled.
(d)	B1 Range and Median circled (underlined) only	

Question number	Answer	Additional guidance
9(a)	B1 for 0.75 and 0.25 in the correct position for Monday. B1 for 0.3 in correct position on the diagram. M1 for 0.6/"0.75" (=0.8) A1 for fully correct diagram.  	Allow use of their 0.75 provided $0.6 < their\ 0.75 < 1$

(b)	M1 ${}^4C_3 \times (0.6)^3 \times 0.4$ (= 0.3456…) M1 0.6^4 (= 0.1296…) depM1 0.3456 + 0.1296 A1 0.4752…	M1 for correct method to find P(X=3) M1 for correct method to find P(X=4) Allow ${}^4C_4 \times (0.6)^4 \times (0.4)^0$ or ${}^4C_4 \times (0.75)^4 \times (0.8)^4$ depM1 adding P(X=3) and P(X=4). Dep on M1M1 scored. For M marks allow use of their p and their q provided $p + q = 1$ A1 accept 0.48 or 0.475

Question number	Answer	Additional guidance
10	M1 $\frac{13.35-14.5}{2.3} = (-0.5)$ A1 -0.5 M1 $(0.3 \times 5.4) + 57.2 \ (= 58.82)$ A1 58.8(2) dep B1ft for eg • Dominic is incorrect as his standardised score is lower for the 100 m • Dominic is incorrect as $-0.5 < -0.2$ oe. depB1ft Kai is correct as his time is over one second longer (than Dominic's).	M1 for $\pm\left(\frac{13.35-14.5}{2.3}\right)$ A1 -0.5 M1 for method to find time for Kai A1 58.8(2) DepB1ft for a correct conclusion with comparison of standardised scores for Dominic. Follow through their standardised score. Dep on first M scored Do not allow reference to standardised scores being closer to 1 or -1 or 0. DepB1ft for a correct conclusion with comparison of times for 100 m. Dep on second M scored. Follow through their time for Kai.

Modifications to the mark scheme for Modified Large Print (MLP) papers: 1ST0 1H

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5º
Measurements of length: ±5 mm

PAPER: 1ST0_1H			
Question		**Modification**	**Mark scheme notes**
1		Wording added ‘Look at the table for Question 1 in the Data Booklet. It’. Wording ‘The table’ removed. Table enlarged. Black table lines. Q1(a)(i) Wording added ‘in the Data Booklet’.	As per standard mark scheme.
2		Wording added ‘Look at the table for Question 2 in the Data Booklet.’ Wording ‘below’ removed and replaced with ‘in the Data Booklet’. Table enlarged. Black table lines.	(a) Frequency is 10
3		Wording added ‘Look at the diagram for Question 3 in the Data Booklet. It shows two population pyramids. They’. Wording ‘The two population pyramids’ removed. Diagrams enlarged. Axes labels moved to the top of the vertical axis. Shading changed.	As per standard mark scheme.
4		Wording added ‘Look at the diagram for Question 4 in the Data Booklet. It shows an incomplete histogram.’ Wording added ‘in the Data Booklet’. Wording added ‘below’. Diagram enlarged. Small squares removed. Shading changed. Bar changed. Axes labels moved to the top of the vertical axis and to the left of the horizontal axis. Open headed arrows. Black grid lines. Table enlarged and left aligned. Wording added ‘There are two spaces to fill'.	As per standard mark scheme.

PAPER: 1ST0_1H			
Question		**Modification**	**Mark scheme notes**
5		None	As per standard mark scheme.
6		Wording added 'Look at the diagram for Question 6 in the Data Booklet. It is a time series graph giving'. Wording removed 'The time series graph gives'. Diagram enlarged. Small squares removed. Intermediates added. Right axis labelled. Black grid lines. Axes labels moved to the top of the vertical axis and to the left of the horizontal axis. Open headed arrows. Crosses changed to solid dots. Dashed lines made longer and thicker. Graph line made thicker.	(a) As per standard mark scheme. (b) As per standard mark scheme. (c) (i) M1 for $\frac{\pm(-60+-75+-80)}{3}$ A1 for -71.7 Working may be seen on graph. Allow ± 10 on each reading. Allow answers in the range -65 to -75 Working may be in thousands. (c)(ii) As per standard mark scheme. (d)(i) M1 200 + ' $-$ 71.7' A1ft 128.3 (d)(ii) As per standard mark scheme.
7		Wording added 'Look at the table for Question 7(c), 7(d) and 7(e) in the Data Booklet. It'. Wording 'The table' removed. Table enlarged. Black table lines.	As per standard mark scheme.

PAPER: 1ST0_1H			
Question		**Modification**	**Mark scheme notes**
8		*Q8(b) and 8(c) Wording added 'Look at the diagram for Question 8(b) and 8(c) in the Data Booklet. It is a control chart drawn by Faiza'. Wording removed 'Faiza draws a control chart'. Diagram enlarged. Small squares removed. Intermediates added. Black grid lines. Crosses changed to solid dots. Axes labels moved to top of vertical axis and left of horizontal axis. Wording removed 'following'. Wording added 'shown below'. Table enlarged. Black table lines. Q8(d) Words stacked vertically and left aligned.	(a) As per standard mark scheme. (b) Please allow same tolerance as on main paper but with larger grid squares – mark intention. (c) As per standard mark scheme. (d) As per standard mark scheme.
9		Wording added 'Look at the diagram for Question 9 in the Data Booklet. It shows an incomplete tree diagram.' Wording removed 'below' and replaced with 'in the Data Booklet. There are six spaces to fill'. Diagram enlarged.	As per standard mark scheme.
10		Wording added 'Look at Table 1 and Table 2 for Question 10 in the Data Booklet.' Wording 'The table' removed and replaced with 'Table 1'. Table 1 enlarged. Wording 'The incomplete table below' removed and replaced with 'Table 2, which is incomplete,'. Table 2 enlarged. Wording removed 'the table' and replaced with 'Table 2 in the Data Booklet'. Wording added 'There are two spaces to fill'.	As per standard mark scheme.

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