CAMBRIDGE
International Education

Cambridge O Level

STATISTICS **4040/12**

Paper 1 **October/November 2025**

MARK SCHEME

Maximum Mark: 100

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	Correct item
	Incorrect item
M1	M0, M1, M2 Method marks awarded
A1	A0, A1, A2 Accuracy marks awarded
B1	B0, B1, B2 Independent marks awarded
SC	Special case
FT	Correct follow through
ISW	Ignore subsequent working
BOD	Benefit of doubt
MR	Misread
TE	Transcription error
^	Essential element of answer/working missing
XP	Incorrect process
SEEN	Working seen but no credit awarded; blank page checked
Highlight	Use anywhere it is helpful to clarify the marking

NOTES FOR MARKERS

Awarding marks

M marks are for method and are not lost for purely numerical errors.
A marks are for accuracy and depend on a correct method.
B marks are independent of method.

Once an acceptable answer is seen, ignore subsequent working, except where such working illustrates a conceptual misunderstanding.

No response

If there is any attempt at a solution award 0 marks not NR. '–' or '?' constitute no attempt at a solution.

Abbreviations

AG answer given (on question paper)
awrt answer which rounds to
cao correct answer only
dep mark depends on earlier, asterisked (*), mark
ft follow through (from earlier error)
oe or equivalent
SC special case
soi seen or implied
nfww not from wrong working

Question	Answer	Marks	Partial Marks
1(a)	median	**1**	B1
1(b)	variance	**1**	B1
1(c)	census	**1**	B1
1(d)	bias	**1**	B1

Question	Answer	Marks	Partial Marks
2(a)	8	**1**	B1
2(b)	6	**1**	B1
2(c)	add teacher and student attendees to find totals 15 14 15 12 13 9 10 11 12 9	**3**	M1
	attempt to order totals 9 9 10 11 12 12 13 14 15 15		M1
	12 **nfww**		A1
2(d)	eliminate totals from 3T,6S = 9 and 8T,2S = 10	**2**	M1
	12.5 **nfww**		A1

Question	Answer	Marks	Partial Marks
3(a)(i)	16	**1**	B1
3(a)(ii)	23	**1**	B1
3(a)(iii)	4	**1**	B1
3(b)	provided 3 is unchanged 8 2 → 5 5	**3**	B1
	5 1 → 3 3		B1
	6 4 → 7 3 *If 3 is changed or absent allow **B1**, **B1** for any two correct pair changes*		B1

Question	Answer	Marks	Partial Marks
4(a)	5/15 or 1/3	**1**	B1
4(b)	4/15	**1**	B1
4(c)	5/9	**1**	B1
4(d)	(7/15) × (8/14)	**3**	B1
	their product of two probabilities × 2		M1
	8/15 **oe**		A1

Question	Answer	Marks	Partial Marks
5(a)	(180/19250) × 1000	**2**	M1
	9.35		A1
5(b)	(32 × 2750)/1000	**2**	M1
	88		A1
5(c)	any group rate × standard population figure	**3**	M1
	2.00 × 0.18 + 4.25 × 0.42 + 10.20 × 0.26 + 32.00 × 0.14 **oe**		A1
	9.28		A1
5(d)	the population has the same structure as the standard population/proportions of population in each age category same as corresponding proportions in standard population **oe**	**1**	B1

Question	Answer	Marks	Partial Marks
6(a)	no visits to the Centre means 1 or more visits to the café impossible/no visits to the Centre must mean no visits to the café	**1**	B1
6(b)(i)	10	**1**	B1
6(b)(ii)	18	**1**	B1
6(c)	[0 × 6 +] 1 × 9 + 2 × 10 + 3 × 5	**2**	M1
	44		A1
6(d)	6	**1**	B1
6(e)	any valid point, e.g. • difficult/impossible to set up a sampling frame • does not know how many people to put in the sampling frame • if sampling frame can be established and customer selected, customer may have left	**1**	B1

Question	Answer	Marks	Partial Marks
7(a)(i)	(90/360) × 245	**2**	M1
	61.25		A1
7(a)(ii)	any expression or equation with r^2 or area seen	**4**	M1
	$(3^2/3.5^2)$ × 245 (= 180) **soi**		M1
	(210/360) × *their* 180 provided *their* 180 < 245		M1
	105		A1
7(b)	[(100 – 74)/100] × 245	**2**	M1
	63.7		A1
7(c)	[(74 – 30)/100] × 245 (= 107.8) **or** [(82 – 35)/100] × *their* 180 (= 84.6)	**3**	M1
	[(74 – 30)/100] × 245 – [(82 – 35)/100] × *their* 180 provided difference is positive		M1
	23.2		A1
7(d)	(30/100) × 245 × (15/100) (= 11.025)	**4**	M1
	(45/360) × 245 (= 30.625)		M1
	(*their* 11.025/*their* 30.625) × 100		M1
	36[%]		A1

Question	Answer	Marks	Partial Marks
8(a)	attempted use of class mid-points (0.5 1.5 3 5 8)	**7**	M1*
	use $(\Sigma fx)/\Sigma f$ (Σfx=216)		M1dep
	3.85714…rot to two or more sf		A1
	finding values of $f \times$ variable squared		M1
	use $(\Sigma fx^2)/\Sigma f - [(\Sigma fx)/\Sigma f]^2$ with/without root (Σfx^2 = 1146)		M1dep
	2.35 – 2.38		A1
	3.86 **and** 2.36 *If 4 × M0 allow **B1** for 3.86 and **B1** for 2.36*		A1
8(b)	rectangles correctly positioned with width 1 height 8	**3**	B1
	width 1 height 24		B1
	width 4 height 5		B1
8(c)	15 × 24 (= 360)	**3**	M1
	[(*their* Σfx)/*their* 360] × 100		M1
	60[%]		A1
8(d)	(*their* Σfx × 6)/15	**2**	M1
	$86.4		A1
8(e)	e.g. • the total hours are estimated using mid-class values, not actual data values • actual data values are unknown • we do not know the charging times of individual vehicles	**1**	B1

Question	Answer	Marks	Partial Marks
9(a)	24 65 132 222 298 346 366	**1**	B1
9(b)	horizontal plots at UCBs 22 24 26 28 30 32 34	**3**	B1
	vertical plots at cfs		M1
	ruled straight lines joining seven plotted points		A1
9(c)(i)	27.0 to 27.2	**1**	B1
9(c)(ii)	Q1: find temperature for cf = 91 to 92 (24.7 to 24.9)	**3**	M1
	use IQR = 29.4 – *their* Q1		M1
	4.5 to 4.7 from correctly drawn graph		A1
9(d)(i)	*their* median + (6 × 0.15)	**2**	M1
	(27.9 to 28.1) **ft**		A1ft
9(d)(ii)	read cf for temperature = 30 – (6 × 0.15) (= 29.1) and subtract from 366	**2**	M1
	101 to 106 *If M0 allow **SC1** for 351 to 356*		A1
9(e)	both Q1 and Q3 increase by the same amount	**2**	B1
	difference Q3 – Q1 unchanged		B1
9(f)	e.g. • linear interpolation assumes straight lines connect upper boundary values, exactly the same as with the polygon • linear interpolation assumes data is uniformly spread through classes • we have joined plotted points with straight lines and not a curve	**1**	B1

Question	Answer	Marks	Partial Marks
10(a)	correctly plotted points ***B1** for 6 or 7 correct*	**2**	B2
10(b)	method for USA [(6+7+8+9)/4, (0.29+0.24+0.23+0.20)/4]	**3**	M1
	plot of (7.5, 0.24)		A1
	plot of (3.5, 0.37) **and** (5.5, 0.305)		B1
10(c)	straight line through at least two of *their* plots in (b)	**4**	B1
	for *m*: use $(y_2 – y_1)/(x_2 – x_1)$ with any pair of averages or other points		M1
	for *c*: use $y = mx + c$ with any point and *their negative m* or read y-axis intercept		M1
	$m = –0.0325$ **and** $c = 0.484$		A1
10(d)(i)	use *their* LOBF with negative *m* and positive *c* to put $x = 5.5$ and find positive *y* **or** read from *their* graph **or** use given overall mean = 0.305	**3**	M1
	multiply by 20 and round to the nearest integer (= 6)		M1
	12 [points] **nfww**		A1
10(d)(ii)	use *their* LOBF with negative *m* and positive *c* to put $x = 10.5$ and find positive *y*	**3**	M1
	multiply by 20 and round to the nearest integer (= 3)		M1
	9 [points] **nfww** *If M1 only in **(i)** and M1 only in **(ii)**,* *allow also **SC1** in **(ii)** for 12.2 rounded to 12 in **(i)*** *and 8.55 to 8.57 rounded to 9 in **(ii)***		A1
10(e)	first, 12 points, *x* value in range of collected data, second involves extrapolation beyond	**1**	B1

