

GCSE

Edexcel GCSE

Statistics 1389

Paper 1F

Summer 2006

Mark Scheme (Results)

NOTES ON MARKING PRINCIPLES

- 1 **Types of mark**
 - M marks: method marks
 - A marks: accuracy marks
 - B marks: unconditional accuracy marks (independent of M marks)

- 2 **Abbreviations**

cao - correct answer only
ft - follow through
isw - ignore subsequent working
SC: special case
oe - or equivalent (and appropriate)
dep - dependent
indep - independent

- 3 **No working**

If no working is shown then correct answers normally score full marks
If no working is shown then incorrect (even though nearly correct) answers score no marks.

- 4 **With working**


If there is a wrong 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.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.
If there is no answer on the answer line then check the working for an obvious answer.

- 5 **Follow through marks**

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, 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.

- 6 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: eg. incorrect cancelling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.
- 7 Probability**
Probability answers must be given a fractions, percentages or decimals. 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 answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.
- 8 Linear equations**
Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.
- 9 Parts of questions**
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

1F Section A								
No	Working	Answer					Mark	Notes
1		√	√		√		3	B3 cao (B1 for each correct tick. For 4 ticks in the table- <u>deduct</u> one mark from the total number of correct ticks) SC: B1 for 5 ticks
2	(a) (b) (c)	Stranraer - Belfast 4 It is the longest route. It takes twice as long as the second longest route, etc Other factors may include the cost, the number of ferries on each route, the ease of getting to the port, competition from other ferries, etc					1 1 2	B1 cao B1 cao B2 for two sensible reasons (B1 for one sensible reason)
3	(a) (b)(i) (ii)	440, 410, 850 200, 420, 230 $\frac{200}{850}$ $\frac{210}{850}$					2 2	B1 for 440, 410 and 850 B1 for 200, 420 and 230 SC: B1 for 4 correct numbers out of 6) B1 for $\frac{200}{850} = \frac{4}{17}$ oe (0.235 or 23.5% awrt) B1 for $\frac{210}{850} = \frac{21}{85}$ oe (0.247 or 24.7% awrt)

1F Section A				
No	Working	Answer	Mark	Notes
(c)		Free-range hens lay larger eggs than battery hens Battery hens lay more small eggs Both types of hens lay similar number of medium eggs. Free range eggs lay more eggs overall (Figures are acceptable)	2	B2 for two sensible reasons (B1 for one sensible reason)
4	(a)	22.81 or 22810	1	B1
	(b)	Rounding errors	1	B1
	(c)	(i) Falling or going down or decreasing (ii) Level or flat or stays the same or up or down (by small amounts) or not much of a trend oe	2	B1, B1
5	(a)		1	B1 for shading 4 squares correctly
	(b)	Uneven spread	1	B1 for 'uneven spread' or 'bunched together' (oe)
6	(a)	3	1	B1 cao
	(b)	2+3+4+5+7+8+10+11 50	1	B1 cao
	(c)	'positive' or 'more sent more received'	1	B1 for 'positive' seen or 'more sent more received' oe
	(d)	Line of best fit	1	B1 for a line close to the points
	(e)	6	1	B1 for 5, 6 or 7

1F Section A				
No	Working	Answer	Mark	Notes
7	(a)	8, 3 and 520, 210 26, 1560	1	B1 for completing the table accurately
	(b)	$\frac{\sum fx}{\sum f} = \frac{1560}{26}$	2	M1 for any 'figure divided' by 26 A1
	(c)	60 for any one of more data, mode or modal size/weight range, IQR, SD, frequency/ number of outlier	1	B1

1F Section B				
No	Working	Answer	Mark	Notes
1	(a)	for any two of 'cheaper' or 'less time consuming' or 'less data to consider' or 'it is easier to do' oe	2	B2 for any correct 2 (B1 for any one)
	(b)	A suitable closed question With boxes or answers to choose from or options within the questions	2	B1 B1
	(c)(i) (ii)	Identify problems shows likely answers check the questions work checks the questions are clear, give an idea of response rate checks the time it takes to do	2	B2 for any two sensible reasons (B1 for one)
	(d)	Not suitably worded question Plus any one from: It asks two questions Needs response boxes/options It is a leading question It puts pressure on respondent to agree It is biased (Any other valid point acceptable)	2	B1 B1

1F Section B				
No	Working	Answer	Mark	Notes
2	(a)	Label B A C on probability scale	2	B2 for plotting points: $0 < B < 0.25$; A within 0.5cm of 0.5; C at 1 (B1 for any two correct)
	(b)	$1 - (0.5 + 0.25 + 0.15)$	2	B2 cao (B1 for 0.9 seen)
	(c)	$0.15 + 0.25$	1	B1 cao
	(d)		1	B1 cao
	(e)	0.5×0.5	0.25	2
3	(a)(i)	40	3	B1 cao
	(ii)	34.5		B1 for 34.5 ± 0.5
	(iii)	Whole number in range 27 – 32 inclusive		B1 for 27; 28; 29; 30; 31; 32
	(b)	4 ... 3 3 5 8 8 5 ... 1 2 3 5	2	B2 cao (B1 for both 4 ... 3 and 5 ... 1)
	(c)(i)	39	2	B1 ft stem and leaf diagram if 8 or 9 values added
	(ii)	19		B1 ft stem and leaf diagram if 8 or 9 values added
	(d)	The female students read the essay more quickly; The median time for the female students is less than the median time for the male students; More of the female students read the essay in less than 38 minutes.	2	B1 for 'females quicker' oe B1 for a sensible reason that compares like with like

1F Section B					
No	Working	Answer	Mark	Notes	
4	(a)	A list of (all) the plants (in the greenhouse)	1	B1 cao	
	(b)	Number the plants. Use random numbers.	2	B1 for 'number the plants' oe B1 for 'use random numbers' oe	
	(c)	Vertical lines with height 10, 4, 1	2	B2 cao (B1 for any two correct)	
	(d)	3	1	B1 cao	
	(e)	$1 \times 5 + 2 \times 7 + \dots$	70	2	M1 for $1 \times 5 + 2 \times 7 \dots$ A1 cao
	(f)	'70' \times 100	7000	1	B1 ft '70' \times 100 from (e)
5	(a)(i)	$(25 + 36 + 29) \div 3$, etc	30, 32, 34	4	B2 for 30, 32, 34 (B1 for one or two of 30, 32, 34)
	(ii)		Moving averages plotted at (2, 25), (3, 27), (1, 28), (2, 29), (3, 30), (1, 32), (2, 34)		B2 cao (B1 ft for 4 points plotted correctly \pm 2mm)
	(b)		(Sales are) increasing	1	B1 for 'increasing' or 'going up' (oe)
	(c)(i)		3 or Sep – Dec	2	B1 for 3 or 'Sep – Dec' oe
	(ii)		Reason		B1 for '(increased sales due to) Christmas' (oe)
	(d)	$\frac{87}{75} \times 100$	116	2	B2 for 116 (B1 for $\frac{87}{75}$ or $\frac{8700}{75}$ or 16% or 1.16 or 0.16 or $\frac{16}{100}$ or $\frac{12}{75}$)
(e)	100 – 5	100 95	2	B1 cao B1 cao	

1F Section B					
No	Working	Answer	Mark	Notes	
6	(a)(i)	$95 - 45 =$	50	2	B1 cao
	(ii)	$70 - 55 =$	15		B1 cao
	(b)		'affected by extreme values' or 'not all values used'	1	B1 for 'affected by extreme values' oe or 'not all values used' oe
	(c)		Box plot drawn	2	B2 cao (B1 for box plot with only one error)
	(d)		'Some (25%) of the cars were speeding' 'A car traveled at 25 mph above the speed limit' '100 cars were speeding''	2	B1 for a suitable comment B1 for a numerical justification