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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Statistics 3311

Foundation Tier

Mark Scheme

2006 examination – June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper..

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AQA GCSE Statistics

The following abbreviations are used on the mark scheme:

M	Method marks awarded for a correct method.
A	Accuracy marks awarded when following on from a correct method. It is not necessary always to see the method. This can be implied.
B	Marks awarded independent of method.
M dep	A method mark which is dependent on a previous method mark being awarded.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special Case. Marks awarded for a common misinterpretation which has some mathematical worth.
oe	Or equivalent.
eeoo	Each error or omission.

Foundation Tier

1(a)	Tallies at least 2 correct	M1	or frequencies if no tallies
	Frequencies 3, 4, 2, 6	A1	
1(b)	Quad biking	B1ft	Do not accept 6
1(c)	Vertical scale	B1	(0,)1 up to 6 or more
	All heights correct	B2ft	2 or 3 heights correct B1 Condone no gaps for B2

2(a)	12	B1	
2(b)	18 – 12	M1	$1\frac{1}{2} \times 4$
	6	A1	
2(c)(i)	2 circles	B1	Award if intention clear
2(c)(ii)	13 × 4	M1	12 + 18 + 14 + 8 Allow one slip on half circles
	52	A1	
2(d)(i)	C	B1	oe
2(d)(ii)	B	B1	oe

3(a)(i)	7	B1	
3(a)(ii)	10	B1	
3(a)(iii)	9	B1	
3(a)(iv)	102 ÷ 12	M1	Must be 12
	8.5	A1	
3(b)	There is a very low value / outlier OR There are lots of 10s	B1	oe
3(c)	Joshua gives lower scores on average (enjoys the books less) Joshua gives less spread out scores	B1 B1	oe / one comment on average oe / one comment on spread

4(a)	3	B1	
4(b)	10	B1	
4(c)	Attempts to add last two columns	M1	Minimum 1 + 2 + 4 or 1 + 4 + 6 + 2
	17	A1	
4(d)	They had no bacon or eggs	B1	oe eg only had cereal! Accept 'did not have anything'
4(e)	No, refers to one of the cells that contradicts Deborah's statement	B1	Must refer explicitly to a cell / cells eg 2 had eggs and no bacon
4(f)	1 + 5 + 4 + 3 + 2 + 4 + 12 + 2	M1	oe eg 13 + 2(10) **Must** show their working in full (ag)
	33	A1	Must show answer is 33 or state 'as required' oe

5(a)	$\frac{360}{48} \times 18$	M1	or 14 or 6 or 10 instead of 18
	135, 105, 45, 75	A1	Allow one error (may lead to two wrong angles from 360 – other three angles)
	Sectors correctly drawn	B1	±2°
	Correct labels or key (minimum 3 sectors)	B1ft	ft if 4 sectors and unambiguous (correct size order for labels)
5(b)(i)	$\frac{6}{48}$	B1	oe eg $\frac{1}{8}$ or $\frac{45}{360}$
5(b)(ii)	Attempts to add 18 and 14	M1	
	$\frac{32}{48}$	A1	oe eg $\frac{2}{3}$ or $\frac{240}{360}$
5(c)	44 ÷ 4	M1	oe eg $\frac{90}{360} \times 44$
	14 – (their 44 ÷ 4)	M1	
	3	A1	

6(a)	Correct heights	B1	Within class interval
	Plotted at midpoints and joined with attempts at straight lines	B1	Ignore lines after first and last plots
6(b)	Long last with any attempt at reason	B1	
	Higher average / More last longer	B1dep	oe

7(a)	$\frac{720}{1600}$	M1	Allow slip on 1600 if method shown
	× 100	M1dep	
	45	A1	
7(b)	Number the students	B1	oe Place all names in a hat
	Obtain random numbers to choose students	B1	oe Pick out 25 names

8(a)	24 – (12 + 3 + 5)	M1	
	4	A1	
8(b)	Wear neither earrings nor glasses	B1	
8(c)(i)	$\frac{5}{24}$	B1	oe 2dp or better
8(c)(ii)	$\frac{3}{24}$	B1	oe eg $\frac{1}{8}$ 2dp or better
8(d)	Numerator 3	B1	oe 2 dp or better Not as a result of cancelling Values must be part of a fraction Accept 0.37 for B2
	Denominator 8	B1	

9(a)	More detail of the shape / Distribution of the data	B1	Shows data more clearly - not enough - B0
9(b)	74	B1	Allow 73.5 oe
9(c)	9 correctly placed	B1	Must be on 2nd diagram

10(a)	Leading question – use of word disaster / use of do you agree	B1	oe Comment on wording of question
	Use of word definitely / No don't know / No maybe / Possibly	B1	oe Comment on response section (could be no instruction to tick a box)
10(b)	Fair wording	B1	eg Do you support a wind turbine being built close to the village? oe
	Response boxes giving covering all degrees of response	B1	Minimum 3 boxes eg Y / N / maybe

11(a)	8 coordinates correctly plotted	B2	B1 6 or 7 coordinates correctly plotted
11(b)	Negative	B1	
11(c)	144 ÷ 8	M1	
	18	A1	
11(d)	Correct double mean point identified	B1	
	Straight line touches or cuts arcs on overlay, negative gradient	B1	
11(e)	Their 12	B1ft	ft their straight line (but value must be integer)
11(f)	Extrapolation / Outside range of data OR Would give negative number of calls	B1	oe

12(a)	Impossible / Very unlikely / Equal chance / Likely / Certain	B2	B1 Completely wrong way round OR B1 4 correct, ie, 1 completely missed
12(b)	Equal chance of each face / H, T	B1	Do not allow 'fair'
12(c)	H shown correctly S shown correctly	B1	Some part of letter / Arrow or indication must be within or touch the guide lines
12(d)(i)	Blue There is one circle out of 5 possibilities	B1	oe **Must** have reason
12(d)(ii)	all correct 4/5 3/5 1/5 4/5 2/5 1/5 OR 0.8 0.6 0.2 0.8 0.4 0.2	B3	oe B2 2 pairs correct B1 all circle probs correct or all square probs correct or one pair correct SC1 all pairs reversed (squares and circles)
12(d)(iii)	Their $\frac{3}{5} \times \frac{4}{5}$	M1	
	$\frac{12}{25}$		oe

13(a)	Mixed	B1	Do not accept 55
13(b)	35 - 30	M1	Accept 30 – 35
	5	A1	
13(c)	**Similarity** Under 16 or 35 - 64 no justification needed OR first 3 groups increase OR 65 and over smallest %	B1	Beware incorrect statements about numbers not %, penalise once
	Difference 65 and over with qualification eg, higher % whites OR 16 - 34 with qualification eg, lower % whites	B1	Do not allow 'young' or 'old'

14(a)(i)	300	B1	
14(a)(ii)	470 – 230	M1	230 – 235 *LQ*
	240	A1ft	235 – 240 for M1A1
14(a)(iii)	$\frac{63}{120}$	M1	62 - 64 inclusive
	× 100	M1	
	52.5	A1ft	Accept 51.6% - 53.33…% from their calculations
14(b)(i)	Their median is lower	B1	or Reference lower maximum (must define what they are comparing)
	Their *IQR* is smaller	B1	or Reference the reduced range (must define what they are comparing)
14(b)(ii)	Data from the non-manual sector	B1	oe eg Obtain data on part-time / Full-time / Hours worked

15	4446 ÷ 90 000	M1	M2 4446 ÷ 90 M2 digits 494 seen
	× 1000	M1	
	49 or 49.4(per thousand)	A1	Allow 4.94(%), 4.9(%) or 5(%)