Statistical Measures

Mark Scheme 2

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Topic	Handling Data Statistics
Sub Topic	Statistical Measures(Mean, Median, Mode)
Booklet	Mark Scheme 2

Time Allowed: **58 minutes**

Score: **/** 48

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

Question	Working	Answer	Mark	Notes
1.	4 x 2.6 (= 10.4) (4 x 2.6 – 5) ÷ 3	1.8	3	M1 or 5.4 seen. M1 Correct full calculation which would lead to correct answer. A1 cao
	Alternative solution: Any 4 numbers (including 5) that have a total 10.4 or any 3 numbers that have a total of 5.4 (Sum of their 3 numbers) ÷ 3	1.8	3	M1 M1 Correct full calculation which would lead to correct answer. A1
				Total 3 marks

2.	4 + 6 + 4 + 7 + 8 + 6 +7 + 7 (= 49) or 9 × 6 (=54) $\frac{"49+a"}{9} = 6$ oe or "54" – "49"	5	3	M1 M1 for 4 + 6 + 4 + 7 + 8 + a + 6 +7 + 7 = 49 + a M1 dep A1
				Total 3 marks

Question	Working	Answer	Mark	Notes		
3.	64 x 4 (=256) 70 x 5 (=350) "350" – "256"	94 or 94% or 94 / 100 or 94 out of 100	4	M1 M1 M1 dep on M2 A1	0.64 × 400 (= 256) 0.7 × 500 (= 350) "350" – "256"	0.64 × 4 (= 2.56) 0.7 × 5 (= 3.5) (3.5 - 2.56) × 100
				NB: 94 embedded in working but not on answer line gets M3A0 unless contradicted.		
	Alternative (i): List of 4 numbers adding to 256 List of 5 numbers adding to 350 list of 5 is identical to list of 4 but also contains 94 eg 94,50,50,56,100 and 50,50,56,100	94 or 94% etc (as above)		M1 M1 M1 dep on M2 A1 permitted answers as listed for A1 above		
	Alternative (ii): 70 – 64 (=6) (70 – 64) X 4 (=24) 70 + 24	94 or 94% etc (as above)		M1 M1 M1 dep on M2 A1 p rmitted answers as listed for A1 above		
				Total 4 marks		

Question	Working	Answer	Mark	Notes
4. (a)		10 to 14	1	B1
(b)	$2\times2+6\times7+20\times12+13\times17+8\times22+3\times27$ or 4 + 42 + 240 + 221 + 176 + 81 or 764		4	M2 Freq x all correct midpoint values stated or evaluated with intention to add (condone any one error). If not M2 then award M1 for all products *t* x *f* (and *t* is consistently within the interval, including end values) and intention to add (condone any one error)
	"764" ÷ 52			M1 (dep on at least M1) for division by 52. Accept their 52 if addition shown.
		14.7		A1 for answer rounding to 14.7 Accept 15 with working (15 without working gains M0A0)
(c)	$\frac{13+8+3}{52}$		2	M1 for 13 + 8 + 3 or 24 or $\frac{a}{52}$ where a<52
	$\frac{24}{52}$	$\frac{6}{13}$ oe		A1 Accept a decimal/percentage answer 0.461538…(46.15…%) truncated or rounded to 3 or more sig figs. Only accept 0.46(46%) if preceded by a more accurate answer or M1(above) awarded.
				Total 7 marks

Question	Working	Answer	Mark	Notes
5.	(6×5) + (10×15) + (19×25) + (15×35) **or** 30 + 150 + 475 + 525 **or** 1180			M2 freq × all correct midpoint values stated (**or** evaluated) with intention to add (condone any one error) If not M2 then award M1 for all products $t \times f$ (and t is consistently within the interval, including end values) and intention to add (condone any one error)
	"1180" ÷ 50 **or** $\frac{"30"+"150"+"475"+"525"}{6+10+19+15}$			M1 (dep on at least M1)
		23.6	4	A1 Accept 24 with working (24 without working gains M0A0)
				Total 4 marks

Question	Working	Answer	Mark	Notes
6. (a)	$7 + 7 + 8 + d = 4 \times 8$ **or** 7, 7, 8, (x) **or** 4×8 (=32)			M1
		10	2	A1 (accept 7, 7, 8, 10 on answer line)
(b)	$\frac{(2\times"7"-3)+(2\times"7"-3)+(2\times"8"-3)+(2\times"10"-3)}{4}$ **or** $\frac{2\times32-12}{4}$ **or** $2 \times 8 - 3$			M1 ft for a complete method using candidate's 4 numbers from (a) **or** $\frac{2a-3+2b-3+2c-3+2d-3}{4}$ oe
		13	2	A1 cao
				Total 4 marks

Question	Working	Answer	Mark	Notes
7. (a)	14 16 17 18 20 21 22 23 23 24 24			M1 arrange in order **or** One of 21(median), 17(LQ), 23(UQ) identified
	(14 16 17 18 20 21 22 23 23 24 24) (14 16 17 18 20) and (22 23 23 24 24) 23 - 17			M1 Identify any **two** of 21, 17 and 23
		6	3	A1 cao
(b)		Carmelo **and** reason using IQR	2	B1 ft from (a) Carmelo - he has a lower IQR oe (IQR must be part of the statement)
				Total 5 marks

Question	Working	Answer	Mark	Notes
8.	0×5 + 1×8 + 2×2 + 3×3 + 4×2 or 0 + 8 + 4 + 9 + 8	29	2	M1 condone one error in products (products need not be evaluated and we need not see 0 or 0×5) A1 SC : B1 for an answer of 34 or 1.45 with no working
				Total 2 marks

Question	Working	Answer	Mark	Notes
9. (a)	18 − 10	8	2	M1 A1
(b)			1	B1 ft from (a)Eg. No as the range and/or iqr for the boys is greater than the same measure for the girls
				Total 3 marks

Q	Working	Answer	Mark	Notes
10.	45×3 + 46×7 + 47×12 + 48×23 + 49×4 + 50×1 or 135 + 322 + 564 + 1104 + 196 + 50 or 2371		3	M1 for at least 3 correct products and summing them
	"2371"÷50 **or** $\frac{45\times3+46\times7+47\times12+48\times23+49\times4+50(\times1)}{50}$			M1 (dep) for division by 50 NB. If division by something other than 50 this must clearly come from adding the frequency column
		47.42		A1 Accept 47, 47.4 if 2371÷50 seen accept $47\frac{21}{50}$ but not $\frac{2371}{50}$
				Total 3 marks

Q	Working	Answer	Mark	Notes
11.		1, 8, 9	2	B2 B1 for 2, 8, 8 **or** 0, 8, 10 **or** for three numbers with a mean of 6 **or** a median of 8 **or** 6 × 3 (=18)
				Total 2 marks

Ques	Working	Answer	Mark	Notes
12. a		16 to 20	1	B1 Accept any unambiguous notation e.g. 16-20
b	3×8 + 8×10 + 13×18 +18×20 + 23×10 + 28×4 **or** 24 + 80 + 234 + 360 + 230 + 112 **or** 1040		4	M1 finds products $f \times x$ consistently within intervals (inc end points) allow 1 error NB. products do not have to be evaluated
				M1 (dep on first M1) –uses midpoints
	$\frac{3\times8+8\times10+13\times18+18\times20+23\times10+28\times4}{8+10+18+20+10+4}$ **or** "1040" ÷ (8+10+18+20+10+4)			M1 (dep on first M1) $\Sigma fx \div \Sigma f$
		14.9		A1 14.8 − 14.9 or $14\frac{6}{7}$ Accept 15 if full working shown
				Total 5 marks

13. (a)	4 × 13 (=52) **or** $\frac{w+x+y+z}{4}=13$ **or** 4×13 – 33		2	M1
		19		A1
(b)	$z-w = 10$ **or** $w = 9$ **or** $w =$ "19" – 10 **or** $x + y = 33 - 9 = 24$		2	M1 ft from (a) (can be implied by 9, x, y, 19 **OR** w, x, y, z with $x + y = 24$)
		12		A1 cao
				Total 4 marks