

Histograms

Mark Scheme

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Topic	Handling Data Statistics
Sub Topic	Histograms(Graphical representation of data)
Booklet	Mark Scheme

Time Allowed: minutes

Score: /

Percentage: /100

Grade Boundaries:

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

Question Number	Working	Answer	Mark	Notes
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1. (i)		120,100	2	M1 1 square = 10 people or any correct fd value seen in correct place with no errors A1 both values correct
(ii)		Blocks at 5, 1, 2 squares	2	B1B1 for all 3 correct blocks, B1B0 for 1 or 2 correct blocks.
				Total 4 marks

2. (a)	10 x 3 or 15 x 2 or 12 x 7.5/3	30	2	M1 or any correct fd in correct position and no errors, or 1 sq = 2 (runners) indicated. A1
(b)	Missing blocks = 6cm, 10cm, 2cm		2	B2 3 correct blocks B1 1 or 2 correct blocks
(c)	0.6 x 20 + 0.8 x "30" or 3 x "4" + 8 x "3" or 450 x 0.08	36	2	M1 (partitionin blocks) (time x fd's) {must see clear evidence that fd values used}. 450 small squares. A1 cao
				Total 6 marks

3. (a)	3.6 ÷ 20 x 100 oe (large squares or heights of bars) or (6+6+6) ÷ (10+10+8+35+19+6+6+6) x 100 or 90 ÷ 500 x 100 (small squares)	18	3	M2 a full and correct calculation leading to correct ans heights = 2+2+1.6+7+3.8+1.2+1.2+1.2 (=20) or 10+10+8+35+19+6+6+6 (=100) if not M2 then M1 for 3.6 and 20 (large sq or heights) or 6+6+6 and 10+10+8+35+19+6+6+6 (heights) or 12+12+12 and 20+20+16+70+38+12+12+12 (frequencies) or 90 and 500 (small sq) A1 Ans only = M2A1
(b)	20 x 10	200	2	M1 or 1 (large) square = 10 (people) or 1 (small) square = 0.4 (people) or correct fd seen with no errors or 16 ÷ 5 (= 3.2) {fd on 3 rd bar} or 20+20+16+70+38+12+12+12 (people in blocks) A1 Ans only = M1A1
				Total 5 marks

4 (i)	5 x 8		40	2	M1 Or any correct fd marked on vertical axis (2, 4 etc) with no errors or 1 square = 4 students A1
(ii)	Missing blocks = 5cm, 6cm, 1.5cm			2	B2 3 correct blocks If not B2 then B1 for 1 or 2 correct blocks
					Total 4 marks

5.		Blocks at heights 2.4, 6.8, 3 squares		3	B3 for all 3 blocks correct (B2 for any 2 blocks correct) (B1 for any one block correct or for correct frequency density calculated or marked ((0.8), 1.2, 3.4 and 1.5) or 1 square = 2.5 people stated or 1 person = 10 squares)
					Total 3 marks

6.	(0.5 x 160), (2 x 50), (1 x 25) 80 + 100 + 25		205	3	M1 for any two or a clear indication that 1 car = 1 small sq or 25 cars = 1 cm ² M1 or 8.2 x 25 oe A1
					Total 3 marks

7.	(8x4)+(5x4)+(3x4) or 0.16({5x40}+{10x12.5}+{30x2.5})		64	3	M1 Correct fd calculated (or marked on vertical axis with no contradictions). or 28 ÷ 2 or 14 or 32, 20, 12 frequencies assigned to correct blocks. or 1 cm ² = 4 customers oe or 1 small square = 0.16 customers oe M1 Correct calculations to give 3 correct frequencies with the intention to add (32 + 20 + 12) A1 cao
					Total 3 marks

8.	(a)	$(2 \times 5) + (8 \times 15) + (16 \times 25) + (10 \times 35) + (4 \times 45)$				3	M2 freq x all correct midpoint values stated or evaluated {do not have to see intention to add}.
			1060				if not M2 then M1 for freq x consistent point in each interval ($f \times x = 860$ or 1260 start & end points). or M1 for 1 error in list of 10, 120, 400, 350, 180 or M1 for 4 correct products stated.
	(b)	1 square = 5 (potatoes) or 1 small square = 0.2 (potatoes) or correct fd calculated ($10 \div 50$) (=0.2) or marked on vertical axis with no errors		8	2		A1 Accept 26.5 if M2 scored.
	(c)	(fd=) $12 \div (450 - 300)$ (= 0.08)	correct block		2		M1 A1 Area block from 300 to 450 grams at height 4 small squares
							Total 7 marks

Question	Working	Answer	Mark	Notes
9.	$(3.1 \times 10) + (2.2 \times 20) + (0.9 \times 30) + (0.3 \times 60)$ or $31 + 44 + 27 + 18$ (=120) or 120 or 12 or 1200 or 600 or 24 oe Or $(3.1 \times 10) + (2.2 \times 20) + (0.9 \times 10)$ or $31 + 44 + 9$ (=84) or 84 or 8.4 or 840 or 420 or 16.8 oe			M1 For a correct method to work out the total area (by using freq density, counting squares, oe) or for a correct method to work out the total area less than 40 calls (by using freq density, counting squares, oe). Allow one error
	$\frac{84}{120}$ or $\frac{8.4}{12}$ or $\frac{840}{1200}$ or $\frac{8}{24}$ or $\frac{420}{600}$ or $\frac{16.8}{24}$ oe			M1ft For a correct fraction $\frac{a}{120}$ oe, or $\frac{84}{b}$ oe where $a < 120$ oe and $b > 84$ oe
			70	A1 cao
				Total 3 marks

Question	Working	Answer	Mark	Notes
10.	Bars of height 1.2 , 2, 2, 3.6, 1.4			M1 for use of frequency \div class width may be implied by 3 correct bars or 3 of $6 \div 5 (=1.2)$, $10 \div 5 (=2)$, $20 \div 10 (=2)$, $36 \div 10 (=3.6)$, $28 \div 20 (=1.4)$
				M1 for at least 4 bars correct or all of 1.2, 2, 2, 3.6 and 1.4 (can be implied by correct heights)
		correct histogram	3	A1 fully correct histogram SC: B2 for all bars in correct proportion but at wrong heights (unless rescaled in which case full marks are available) (eg heights of 0.6, 1, 1, 1.8, 0.7)
				Total 3 marks

Q	Working	Answer	Mark	Notes
11.	$26 \div 20 (=1.3)$ or 3.6×10 or 3.3×10 or 1×30 or 36 or 33 or 30 or $\frac{26}{130} \left(= \frac{1}{5} \right)$		3	M1 Any one frequency density (without contradiction) or, eg. $1\text{cm}^2 = 5$ or clear association of area with frequency
	$26 + 3.6 \times 10 + 3.3 \times 10 + 1 \times 30$ or $26 + 36 + 33 + 30$ or $625 \times \frac{1}{5}$ or $(130 + 180 + 165 + 150) \times \frac{1}{5}$			M1 Any fully correct complete method; condone one error in bar width or bar height
		125		A1
				Total 3 marks

Ques	Working	Answer	Mark	Notes
12	$360 \div 9 = 40$ (per cm sq) or $360 \div (9 \times 25) = 1.6$		3	M1
	"40" \times 19 or $7 \times "40" + 6 \times "40" + 6 \times "40"$ or $280 + 240 + 240$ or $19 \times 25 \times "1.6"$			M1 dep
		760		A1
	Alternative method $2a \times 12 + 6a \times 8 = 360$			M1
	$a = \frac{360}{72} = 5$ and $14 \times 5 \times 4 + 12 \times 5 \times 4 + 4 \times 5 \times 12$			M1 dep
		760		A1
				Total 3 marks

13.	Any 2 of $50 \div 20(=2.5)$, $90 \div 30(=3)$, $120 \div 50(=2.4)$, $160 \div 200(=0.8)$		3	M1 for any two correct fd calculations can be implied by any two correct frequency densities or any two correct bars
	Any 3 of 2.5, 3, 2.4, 0.8			A1 for any 3 FDs correct (can be implied by at least 3 correct bars)
		Correct histogram		A1 for a fully correct histogram SC : B2 All four bars of correct width with heights in the correct ratio (B1 for 3 bars of correct width with heights in the correct ratio)
				Total 3 marks