Mark scheme

Estimating the mean from grouped data

Mathematics 0580 · Questions from Paper 2 and Paper 4

Total marks

58

MARKS FOR EACH QUESTION

1	2	3	4	5	6	7	8	9	10	Total
4	4	4	4	7	7	7	7	7	7	**58**

Question 1 **[4]**

1	13.09	**4**	**M1** for mid-values 7.5, 11 and 16 soi **M1** for Σfx where x-values in correct interval (including boundaries) **M1dep** on second **M1** for $\frac{\Sigma fx}{50}$

Question 2 **[4]**

2	138.425	**4**	**M1** for mid-points soi (110, 125, 140, 170) **M1** for use of Σfh with h in correct interval including both boundaries **M1** for (dep on 2nd M1) for $\Sigma fh \div 200$

Question 3 **[4]**

3	44.1 or 44.07...	**4**	**M1** for 4 of mid-values 15 30 45 55 75 soi **M1** for $\sum fx$ for any x in intervals including boundaries **M1 dep** for $\sum fx \div 70$ **Dep** on 2nd **M** mark earned

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Question 4 **[4]**

4	28.33 or 28.3 or 28.33…	**4**	**M1** for midpoints soi **M1** for use of $\sum fx$ **M1 dep** for $\sum fx \div 60$

Question 5 **[7]**

5(a)	27.625	**4**	**M1** for 5, 12.5, 17.5, 30, 57.5 **M1** for $\sum fx$ where x is in correct interval including boundaries **M1** dep on second **M1** for $\frac{\Sigma fx}{100}$
5(b)	6 and 2.4	**3**	**B2** for either correct or **M1** for [fd =] 1.5 or 0.6 oe or **B1** for [multiplier] 4

Question 6 **[7]**

6(a)	208	**4**	**M1** for midpoints soi 190, 205, 212.5, 222.5 **M1** for use of Σfx where x is in the correct interval including boundaries $190 \times 32 + 205 \times 64 + 212.5 \times 74 + 222.5 \times 30$ **M1** (dep on second M1) for $\Sigma fx \div 200$
6(b)	0.8 3.2 1	**3**	**B2** for two correct or **B1** for one correct or **M1** for three of 1.6, 6.4, 14.8 and 2 seen

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Question 7 [7]

7 (a)	32.5 cao www4	4	**M1** for mid-values seen **M1** for use of Σfx with x's anywhere in each interval $(10 \times 15 + 30 \times 30 + 20 \times 45)$ **M1** $\div 60$ dependent on second M1
(b)	Histogram drawn	3	**B1** Bars correct positions and widths – no gaps **B2** Heights of bars 1, 1.5 and 2 (**B1** for any two correct or for heights in the ratio 2:3:4)

Question 8 [7]

8(a)	1.606 25	**4**	**M1** for mid-points **soi** (1.35, 1.55, 1.65, 1.8) **M1** for use of Σfm with m in correct interval including both boundaries **M1 dep** (dep on 2nd M1) for $\Sigma fm \div 80$
8(b)	Correct histogram	**3**	**B2** for 3 correct blocks or **B1** for 2 correct blocks If 0 scored, **SC1** for 3 correct freq densities soi (40, 200, 340, 70)

Question 9 [7]

9(a)	Correct histogram	**3**	**B1** for each correct block If 0 scored, **SC1** for two of $\frac{28}{15}$, $\frac{33}{20}$, $\frac{13}{10}$ or 1.87 or 1.866 to 1.867, 1.65, 1.3
9(b)	38.65	**4**	**M1** for 12.5, 20, 32.5, 50, 65 soi **M1** for $\sum fx$ where x is in the correct interval including boundaries **M1dep** for $\sum fx \div 100$

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Question 10 **[7]**

10(a)	54, 76, 96	**3**	**B1** for each
10(b)	187 or 186.8 to 186.9 nfww	**4**	**M1** for 155, 175, 185, 200, 225 soi **M1** for Σ*fm* with *their* frequencies from **(a)** 155 × *their* 54 + 175 × *their* 76 + 185 × *their* 96 + 200 × 92 + 225 × 42 **M1** (dep on second **M1**) for *their* Σ*fm* ÷ 360

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