

SAMPLE PAPER 5: PAPER 2

QUESTION 2 (25 MARKS)

Question 2 (a)

	13-year-olds	5-year-olds	16-year-olds
Size N	150	2250	70
Mean μ	17	16.5	23
Standard Deviation σ	1.8	2	4.2

The biggest sample is 5-year-olds and the number sampled was 2,250.

Question 2 (b)

The data in the set of 16-year-olds is more spread out than the data in the other sets.

Question 2 (c)

$$\mu = 16.5, N = 2250, \text{Sum} = ?$$

$$16.5 = \frac{\text{Sum}}{2250} \Rightarrow \text{Sum} = 16.5 \times 2250 = 37\,125$$

$\mu = \frac{\text{Sum of } x's}{n}$

Question 2 (d)

2250 5-year-olds: Sum of all results = 37 125

150 13-year-olds: Sum of all results $17 \times 150 = 2550$

70 16-year-olds: Sum of all results $23 \times 70 = 1610$

Total number of students = $2250 + 150 + 70 = 2470$

Sum of all results of all students = $37\,125 + 2550 + 1610 = 41\,285$

$$\text{Mean of all three sets } \mu = \frac{41285}{2470} = 16.7$$

Question 2 (e)

EMPIRICAL RULE 68% of all data points fall within 1 standard deviation of the mean. 95% of all data points fall within 2 standard deviations of the mean. 99.7% of all data points fall within 3 standard deviations of the mean.

$$\mu = 23, \sigma = 4.2$$

$$\mu + 2\sigma = 23 + 2(4.2) = 31.4$$

$$\mu - 2\sigma = 23 - 2(4.2) = 14.6$$

95% of all the data points in the 16-year-old set lie between 14.6 and 31.4.

Question 2 (f)

If all three sets are combined, the median results are most likely to be a value in the set of 5-year-olds.
