

SAMPLE PAPER 5: PAPER 2

QUESTION 4 (25 MARKS)

Question 4 (a)

Score	f	x	fx	CF
0–10	20	5	100	20
10–20	60	15	900	80
20–30	140	25	3500	220
30–40	200	35	7000	420
40–50	400	45	18 000	820
50–60	500	55	27 500	1320
60–70	430	65	27 950	1750
70–80	260	75	19 500	2010
80–90	140	85	11 900	2150
90–100	60	95	5700	2210
	2210		122 050	

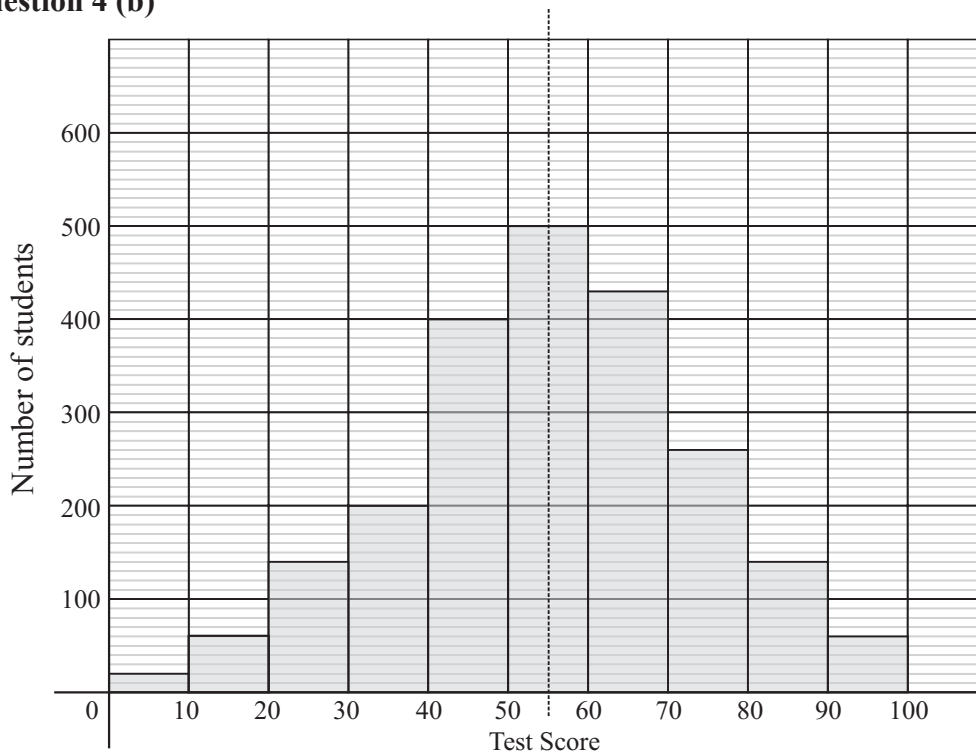
Question 4 (a) (i)

Number of students = 2210

Question 4 (a) (ii)

$$\text{Mean } \mu = \frac{122\,050}{2210} = 55.2$$

Question 4 (b)



The 1105th student has the median score. This student lies in the 50–60 class interval.

$$\text{Median} = \frac{(1105 - 820)}{500} \times 10 + 50 = 55.7$$

The median and mean are nearly the same as the distribution is close to normal.

Question 4 (c) (i)

$$\sigma = 18.5, \mu = 55.2$$

$$\mu + \sigma = 55.2 + 18.5 = 73.7$$

$$\mu - \sigma = 55.2 - 18.5 = 36.7$$

68% of students scored within 1 standard deviation of the mean.

EMPIRICAL RULE: In any normal distribution with mean μ and standard deviation σ .

1. 68% of the data falls within 1σ of the mean μ .
2. 95% of the data falls within 2σ of the mean μ .
3. 99.7% of the data falls within 3σ of the mean μ .

Question 4 (c) (ii)

$$\text{New mean} = 58.2$$

New standard deviation = 18.5 (The spread of scores remain unchanged.)
