Statistics topic test 1

Name: _____ Date: _____

10 questions | 40 marks | 65 minutes

A progressive original paper on investigation design, numerical summaries and evidence-based interpretation.

A scientific calculator may be used.

1. A school surveys 45 randomly selected students from its 360 Year 11 students about weekly leisure reading. [4 marks]

(a) Identify population and sample. [2 marks]

(b) Write a clear statistical question. [2 marks]

2. Classify four library-survey variables. [4 marks]

(a) Borrowing-card number and number of books borrowed. [2 marks]

(b) Time spent in the library and low/medium/high satisfaction. [2 marks]

3. A researcher selects the first 30 students leaving the gym. [4 marks]

(a) Name the method and a possible bias. [2 marks]

(b) Describe a more suitable random selection. [2 marks]

4. Travel times are 5, 8, 8, 10, 14, 15 minutes. [4 marks]

(a) Find mean and median. [2 marks]

(b) Find range and state its units. [2 marks]

5. Values 0, 1, 2, 3 have frequencies 2, 4, 3, 1. [4 marks]

Value	0	1	2	3
Frequency	2	4	3	1

(a) Find total frequency and mode. [2 marks]

(b) Calculate mean. [2 marks]

6. Ordered scores are 2, 4, 6, 8, 10, 12, 14, 16. Use medians of halves. [4 marks]

(a) Find Q_1, median, Q_3. [2 marks]

(b) Find and interpret IQR. [2 marks]

7. A sample has $Q_1 = 12$ and $Q_3 = 20$. [4 marks]

(a) Find both 1.5-IQR fences. [2 marks]

(b) A recorded value 35 is genuine. Must it be deleted? [2 marks]

8. Waiting-time summaries are A $(4, 10, 14, 18, 30)$ and B $(6, 11, 12, 15, 22)$, in minutes. [4 marks]

(a) Compare median and IQR. [2 marks]

(b) Is every B time lower than every A time? [2 marks]

9. A voluntary online poll finds 80% of 200 respondents support later school starts. [4 marks]

(a) Can 80%be assumed to describe the school? [2 marks]

(b) Suggest an improvement and one report limitation. [2 marks]

10. A survey finds higher marks among study-club members and claims the club caused them. [4 marks]

(a) Explain the causal limitation. [2 marks]

(b) Write a cautious conclusion and name useful extra data. [2 marks]