

Problem 1

(3) e. None of the above is correct

The median is 89, so half of the scores are below 89 (not 88).

The middle 50% is between $Q1 = 80$ and $Q3 = 93$ (not 85 and 93).

One-quarter of the scores are less than or equal to 80, which means three-quarters are greater than 80 (so the statement "One-quarter of the scores are greater than 80" is incorrect).

The median = 89 does not necessarily imply it's the most common (the mode).

Hence no listed statement is correct.

Correct answer: (e) ("None of the above is correct.")

Problem 2

(1) Winterm TN - Quantitative, Continuous

- (2) b) Maximum observation below upper inner fence
 f) Minimum observation above the lower inner fence

Problem 3

(3)

Assume lenses are produced independently. Let Y be the number of defect-free lenses among 10 randomly drawn lenses.

We know $\Pr(X = 0) = 0.45$

Probability Mass Function:

$$Y \sim \text{Binomial}(n=10, p=0.45).$$

For $k = 0, 1, 2, 3, \dots, 10$

$$\Pr(Y = k) = \binom{10}{k} (0.45)^k (0.55)^{10-k}$$

$$\text{Expected value} = E[Y] = np = 10 * 0.45 = 4.5$$

$$\text{Variance} = \text{Var}(Y) = np(1-p) = 10 * 0.45 * 0.55 = 2.475$$

Problem 4

Let $p = 0.45$ probability a lens is defect-free. Then for 5 lenses all defect-free:

$$\Pr(\text{all 5 are defect free}) = (0.45)^5$$

$$\Pr(\text{all 5 are defect free}) = 0.0184$$

