Sampling, Center and Spread

Choose one answer per question. Circle A, B, C, or D.

1. A school district wants to learn what all its sixth graders think about lunch menus. Researchers collect answers from four sixth-grade classes. What is the population of interest?

A. All sixth graders in the district
B. Only the students in the four selected classes
C. All students in every grade in the district
D. Only sixth graders who like their lunches

2. A gardener randomly selects 20 trees from an orchard of 200 trees. The selected trees average 3 meters tall. What kind of number is that average?

A. A population count
B. A known population parameter
C. A sample statistic
D. A margin of error

3. For a camp event, the median wait is 15 minutes. Which statement must be true of the recorded waits?

A. Exactly half are shorter than 15 minutes.
B. At least half are 15 minutes or less.
C. All the waits are exactly 15 minutes.
D. The arithmetic mean is exactly 15 minutes.

4. A report lists the mean and standard deviation of several travel times. What does the standard deviation help describe?

A. What percentage of trips reached exactly the mean
B. How many trips were recorded
C. Which trip lasted the longest
D. How spread out the times are around the mean

5. In a sample of 80 readers, 20 ask the library to extend its hours. What percentage of this sample asks for longer hours?

A. 20%
B. 25%
C. 40%
D. 75%

6. Organizers want feedback from all the ticket holders at a festival. Which method gives every equally sized sample the same chance to be selected?

A. Randomly draw ticket holders from the complete ticket list without replacement.
B. Ask every person who waits at the busiest entrance to reply.
C. Put up a sign and let interested ticket holders volunteer.
D. Ask only the ticket holders who arrived before noon.

7. A school has 400 day students and 100 evening students. A proportional stratified sample should contain 25 students. How many should be randomly selected from each group?

A. 10 day and 15 evening
B. 25 day and 0 evening
C. 15 day and 10 evening
D. 20 day and 5 evening

8. A transit agency randomly picks 100 riders for a survey. Only 14 reply. Why could the answers still give a biased picture of the riders?

A. A smaller reply count makes answers biased regardless of who replies.
B. Random selection guarantees the 14 replies represent everyone.
C. The people who reply may differ systematically from those who do not.
D. The low reply count makes the survey an experiment.

9. The lower quartile of a set of prices is 12 dollars and the upper quartile is 33 dollars. What is the interquartile range?

A. 21 dollars
B. 12 dollars
C. 33 dollars
D. 45 dollars

10. Two groups report a median wait of 18 minutes. Group A has an interquartile range of 2 minutes and Group B has an interquartile range of 6 minutes. Which conclusion follows?

A. Group A must have the larger overall range.
B. Group B must have the longest single wait.
C. The middle halves of the two groups occupy equal-width intervals.
D. The middle half of Group B’s waits occupies a wider interval.

11. Twelve morning visitors wait an average of 18 minutes. Eight evening visitors wait an average of 23 minutes. What is the mean wait for all 20 visitors?

A. 21 minutes
B. 20.5 minutes
C. 20 minutes
D. 22 minutes

12. An app added 3 minutes to every recorded delivery duration by mistake. Each recorded time is corrected by subtracting 3 minutes. What happens to the mean and interquartile range?

A. Both fall by 3 minutes.
B. The mean falls by 3 minutes and the interquartile range stays the same.
C. The mean stays the same and the interquartile range falls by 3 minutes.
D. The mean rises by 3 minutes and the interquartile range stays the same.

13. A set of values has lower quartile 14 and upper quartile 22. A value is flagged as a potential high outlier only if it is greater than the upper quartile plus 1.5 times the interquartile range. Which value is flagged?

A. 22
B. 34
C. 33
D. 37

14. Of 120 invited survey participants, 80 reply, and 48 of the replies support a proposal. Among all 120 invited people, what are the fewest and most who could support it?

A. 48 and 88
B. 48 and 80
C. 40 and 88
D. 80 and 120

15. In a morning shift, Team A meets its target on 12 of 15 tasks and Team B on 8 of 10. In the evening, Team A meets it on 2 of 10 and Team B on 3 of 15. Which interpretation fits the counts?

A. The teams match within each shift and in their combined rates.
B. Team A has a higher rate within both shifts and overall.
C. The teams match within each shift, but Team A has the higher combined rate.
D. Team B has the higher combined rate because it succeeds on more evening tasks.