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Biology Grade 10 — Chapter 11

Biostatistics and Data Analysis

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Independent practice MCQs from the supplied Class 10 Biology notes pack. Total: 50 questions.

A. Important / Main Topics

1. What is the application of statistical methods to biological, medical, and health sciences called?

(A) Biostatistics
(B) Biotechnology
(C) Biometry
(D) Biophysics

Correct Answer: A

Explanation: Biostatistics is the application of statistical methods and principles to analyse and interpret the findings of biological, medical and health sciences.

2. What is a single value calculated to represent the whole data called?

(A) Median
(B) Average
(C) Mode
(D) Range

Correct Answer: B

Explanation: Average is a single value which is calculated to represent the whole data.

3. What is the sum of all values divided by the total number of values called?

(A) Median
(B) Mode
(C) Mean
(D) Range

Correct Answer: C

Explanation: Mean is the sum of all the values of data set divided by the total number of values in the data set.

4. What is the middle value in a dataset arranged in order called?

(A) Mean
(B) Mode
(C) Range
(D) Median

Correct Answer: D

Explanation: The median is the middle value in a dataset that is arranged in ascending or descending order of magnitude.

5. What is the most frequently occurring value in a dataset called?

(A) Mode
(B) Mean
(C) Median
(D) Range

Correct Answer: A

Explanation: The mode is the value in a dataset that appears maximum number of times.

6. What is the symbol for mean?

(A) tildex
(B) barx
(C) hatx

(D) x

Correct Answer: B

Explanation: Barx — this correctly answers the question.

7. What is the symbol for median?

(A) barx
(B) hatx
(C) tildex
(D) x

Correct Answer: C

Explanation: The median is denoted by tildex (x tilde).

8. What is the symbol for mode?

(A) barx
(B) tildex
(C) x
(D) hatx

Correct Answer: D

Explanation: The mode is denoted by hatx (x-hat).

9. What is the formula for mean of ungrouped data?

(A) barx = fracsum xn
(B) barx = fracsum fxsum f
(C) tildex = ≤ft(fracn+12right)th
(D) hatx = l + frac(f_m - f□) × h(f_m - f□) + (f_m - f□)

Correct Answer: A

Explanation: The formula for mean of ungrouped data is barx = fracsum xn.

10. What is the formula for mean of grouped data?

(A) barx = fracsum xn
(B) barx = fracsum fxsum f
(C) tildex = ≤ft(fracn+12right)th
(D) hatx = l + frac(f_m - f□) × h(f_m - f□) + (f_m - f□)

Correct Answer: B

Explanation: The formula for mean of grouped data is barx = fracsum fxsum f.

11. What is a graph that uses bars of equal width but variable length called?

(A) Pie chart
(B) Line graph
(C) Bar chart
(D) Histogram

Correct Answer: C

Explanation: A bar chart uses bars of equal width but variable length (or height) to represent data.

12. Which axis is horizontal in a bar chart?

(A) Y-axis
(B) Z-axis
(C) None of the above
(D) X-axis

Correct Answer: D

Explanation: The horizontal line is the X-axis in a bar chart.

13. Which axis is vertical in a bar chart?

(A) Y-axis
(B) X-axis
(C) Z-axis

(D) None of the above

Correct Answer: A

Explanation: The vertical line is the Y-axis in a bar chart.

14. What does a bar chart represent?

(A) Two characteristics of data
(B) One characteristic of data
(C) Three characteristics of data
(D) All of the above

Correct Answer: B

Explanation: One characteristic of data — this correctly answers the question.

15. What does the height of a bar represent?

(A) Frequency
(B) Percentage
(C) Magnitude of a quantity
(D) Average

Correct Answer: C

Explanation: Magnitude of a quantity — this correctly answers the question.

16. Which measure of central tendency is affected by extreme values?

(A) Median
(B) Mode
(C) All of the above
(D) Mean

Correct Answer: D

Explanation: The mean is affected by extreme values (outliers), while the median and mode are not.

17. Which measure of central tendency is NOT affected by extreme values?

(A) Both B and C
(B) Mean
(C) Median
(D) Mode

Correct Answer: A

Explanation: Both median and mode are not affected by extreme values.

18. What is the median of 3, 5, 7, 9, 11?

(A) 5
(B) 7
(C) 9
(D) 11

Correct Answer: B

Explanation: The median of 3, 5, 7, 9, 11 is the middle value, which is 7.

19. What is the median of 3, 5, 7, 9?

(A) 5
(B) 7
(C) 6
(D) 8

Correct Answer: C

Explanation: The median of 3, 5, 7, 9 is the average of the two middle values (5 + 7) / 2 = 6.

20. What is the mode of 3, 5, 5, 6, 9, 9, 10, 12?

(A) 5
(B) 9
(C) No mode

(D) Both 5 and 9

Correct Answer: D

Explanation: Both 5 and 9 appear most frequently (2 times each), so the mode is 5 and 9 (bimodal).

21. What is the mode of 3, 5, 6, 6, 9, 10, 9, 6, 6?

(A) 6
(B) 3
(C) 5
(D) 9

Correct Answer: A

Explanation: 6 — this correctly answers the question.

22. What is the mean of 2, 4, 6, 8?

(A) 4
(B) 5
(C) 6
(D) 7

Correct Answer: B

Explanation: 5 — this correctly answers the question.

23. What is the mean of 10, 20, 30, 40, 50?

(A) 20
(B) 25
(C) 30
(D) 35

Correct Answer: C

Explanation: 30 — this correctly answers the question.

24. Which of the following is NOT a type of average?

(A) Mean
(B) Median
(C) Mode
(D) Range

Correct Answer: D

Explanation: Range is a measure of dispersion, not a measure of central tendency (average).

25. What is the first step in sketching a bar chart?

(A) Take graph paper
(B) Draw the bars
(C) Label the axes
(D) Choose a scale

Correct Answer: A

Explanation: The first step in sketching a bar chart is to take graph paper with sui.

B. Less Important / Secondary Topics

26. What is the first step in biostatistics studies?

(A) Identification of problem
(B) Designing experiments
(C) Collecting data
(D) Interpreting results

Correct Answer: A

Explanation: Identification of problem is the first step in biostatistics studies.

27. Which of the following is a use of biostatistics?

(A) Agriculture

(B) All of the above
(C) Medical research
(D) Epidemiology

Correct Answer: B

Explanation: Biostatistics is used in agriculture, medical research, epidemiology, public health, genetic diseases, pollution, and survival analysis.

28. What is the use of biostatistics in epidemiology?

(A) Monitoring disease spread
(B) Identifying risk factors
(C) All of the above
(D) Controlling outbreaks

Correct Answer: C

Explanation: All of the above — this correctly answers the question.

29. What is the use of biostatistics in survival analysis?

(A) Predicting survival rate
(B) Estimating life expectancy
(C) Assessing treatment success
(D) All of the above

Correct Answer: D

Explanation: Biostatistics is used to predict survival rate, estimate life expectancy, and assess treatment success.

30. What is the formula for median of ungrouped data with odd number of values?

(A) ≤ft(fracn+12right)th value
(B) frac≤ft(fracn2right)th + ≤ft(fracn2 + 1right)th2
(C) fracsum xn
(D) fracsum fxsum f

Correct Answer: A

Explanation: The formula for median of ungrouped data with odd number of values is ≤ft(fracn+12right)th value.

31. What is the formula for median of ungrouped data with even number of values?

(A) ≤ft(fracn+12right)th value
(B) frac≤ft(fracn2right)th + ≤ft(fracn2 + 1right)th2
(C) fracsum xn
(D) fracsum fxsum f

Correct Answer: B

Explanation: The formula for median of ungrouped data with even number of values is the average of the two middle values.

32. What is the formula for mode of grouped data?

(A) barx = fracsum xn
(B) barx = fracsum fxsum f
(C) hatx = l + frac(f_m - f□) × h(f_m - f□) + (f_m - f□)
(D) tildex = ≤ft(fracn+12right)th

Correct Answer: C

Explanation: The formula for mode of grouped data is hatx = l + frac(f_m - f□) × h(f_m - f□) + (f_m - f□).

33. What is the advantage of median over mean?

(A) It is easier to calculate
(B) It uses all data values
(C) It is more accurate
(D) It is not affected by extreme values

Correct Answer: D

Explanation: The median is not affected by abnormally large and small values in the dataset.

34. What is the disadvantage of mode?

(A) All of the above
(B) It may not exist
(C) It may be multiple
(D) It may not be representative

Correct Answer: A

Explanation: The mode may not exist (amodal), may be multiple (bimodal/multimodal), and may not be representative if data is spread out.

35. What is the disadvantage of median?

(A) It cannot be used for further statistical analysis
(B) All of the above
(C) It may not be in the dataset
(D) It cannot be used for specific values

Correct Answer: B

Explanation: The median cannot be used for further statistical analysis, may not be in the dataset, and cannot be used where specific values (e.g., weight, age) are used.

36. A dataset has the following values: 2, 4, 4, 4, 5, 5, 7, 9. What is the mode?

(A) 5
(B) 4 and 5
(C) 4
(D) No mode

Correct Answer: C

Explanation: 4 — this correctly answers the question.

37. A dataset has the following values: 10, 20, 30, 40, 50, 60. What is the median?

(A) 30
(B) 40
(C) 45
(D) 35

Correct Answer: D

Explanation: The median is the average of the two middle values (30 + 40) / 2 = 35.

38. A dataset has the following values: 5, 10, 15, 20, 25. What is the mean?

(A) 15
(B) 10
(C) 20
(D) 25

Correct Answer: A

Explanation: 15 — this correctly answers the question.

39. Which measure of central tendency would be best for a dataset with extreme values?

(A) Mean
(B) Median
(C) Mode
(D) Range

Correct Answer: B

Explanation: The median is not affected by extreme values, making it the best measure for skewed data.

40. A dataset has the following values: 1, 2, 2, 3, 3, 3, 4, 4, 4, 4. What is the mode?

(A) 2
(B) 3
(C) 4
(D) No mode

Correct Answer: C

Explanation: 4 — this correctly answers the question.

41. A dataset has the following values: 100, 200, 300, 400, 500. What is the mean?

(A) 200
(B) 250
(C) 350
(D) 300

Correct Answer: D

Explanation: 300 — this correctly answers the question.

42. Which of the following statements about the mean is correct?

(A) It uses all data values
(B) It is not affected by extreme values
(C) It is always the best measure
(D) It cannot be calculated for grouped data

Correct Answer: A

Explanation: The mean uses all data values in its calculation.

43. A dataset has the following values: 10, 20, 20, 30, 30, 30, 40. What is the mode?

(A) 20
(B) 30
(C) 20 and 30
(D) No mode

Correct Answer: B

Explanation: 30 — this correctly answers the question.

44. What is the median of the following dataset: 5, 10, 15, 20, 25, 30?

(A) 15
(B) 20
(C) 17.5
(D) 22.5

Correct Answer: C

Explanation: The median is the average of the two middle values (15 + 20) / 2 = 17.5.

45. Which of the following would be affected if the sample size is increased?

(A) Mean
(B) Median
(C) Mode
(D) All of the above

Correct Answer: D

Explanation: Increasing the sample size can affect the mean, median, and mode of the dataset.

46. A dataset has the following values: 2, 4, 6, 8, 10, 12, 14. What is the median?

(A) 8
(B) 6
(C) 10
(D) 12

Correct Answer: A

Explanation: The median is the middle value, which is 8.

47. A dataset has the following values: 3, 6, 9, 12, 15. What is the mean?

(A) 8
(B) 9
(C) 10
(D) 11

Correct Answer: B

Explanation: 9 — this correctly answers the question.

48. Which of the following is the correct sequence of steps in biostatistics studies?

(A) Designing experiments → Identification of problem → Collecting and analysing data → Interpreting results → Developing new tools

(B) Collecting and analysing data → Identification of problem → Designing experiments → Interpreting results → Developing new tools

(C) Identification of problem → Designing experiments → Collecting and analysing data → Interpreting results → Developing new tools

(D) Interpreting results → Identification of problem → Designing experiments → Collecting and analysing data → Developing new tools

Correct Answer: C

Explanation: The correct sequence of biostatistics studies is identification of problem, designing experiments, collecting and analysing data, interpreting results, and developing new tools.

49. Which of the following would be affected if the sample size is small?

(A) Mean

(B) Median

(C) Mode

(D) All of the above

Correct Answer: D

Explanation: A small sample size can affect the accuracy of the mean, median, and mode.

50. A dataset has the following values: 1, 1, 2, 2, 3, 3. What is the mode?

(A) No mode

(B) 1

(C) 2

(D) 3

Correct Answer: A

Explanation: All values (1, 2, and 3) appear the same number of times (2 times each), so there is no mode (amodal).