

9th Biology Unit 11 Short - Corrected Version

Short Answer Questions (Exercise)

Q.1. Define biostatistics.

Ans. Biostatistics is a branch of statistics that applies statistical methods to biological sciences. Biostatistics is essential for designing biological experiments, clinical trials, and epidemiological studies.

Q.2. What is the median of a data set?

Ans. The median is the middle value of a data set when the values are arranged in ascending or descending order. If the number of values is odd, the median is the middle value. If the number of values is even, the median is the average of the two middle values.

Q.3. How is the mean calculated?

Ans. Mean is calculated by adding all the values together and dividing the total by the number of values.

Q.4. What does the height of a bar in a bar chart represent?

Ans. A bar chart is a graphical representation of data using bars of different heights or lengths. It is used to compare the quantities of different categories. Bar charts are effective for comparing different categories and visually representing the distribution of data.

Q.5. What is the mode of a data set?

Ans. The mode is the value that appears most frequently in a data set. A data set may have one mode, more than one mode, or no mode at all.

Steps to Calculate Mode

- Count the frequency of each value in the data set.
- The value with the highest frequency is the mode.

Example

Consider the data set: 150, 160, 165, 155, 160

- Frequencies: 150(1), 160(2), 165(1), 155(1)
- The value with the highest frequency is 160.

So the mode of the data set is 160.

Short Answer Questions (Additional)

Biostatistics and Its Applications

Q.6. Enlist the uses of biostatistics.

Ans. (a) Designing biological experiments
(b) Clinical trials
(c) Epidemiological studies

Q.7. Explain any two uses of biostatistics.

Ans.

Uses of Biostatistics

The major uses of biostatistics include:

1. Designing Experiments and Studies

Biostatistics helps in planning and structuring experiments to ensure that the data collected will be relevant and sufficient to answer the research questions.

Example

For instance, in a clinical trial testing a new drug, biostatisticians determine the sample size needed to detect a significant effect.

2. Analyzing Biological Data

Biostatistics involves applying statistical techniques to analyze data. This analysis can uncover trends, correlations and patterns.

Example

Analyzing the growth rates of plants under different environmental conditions can reveal how factors like light and water affect growth.

Q.8. Give two examples of the uses of biostatistics.

Ans.

1. Epidemiology

Epidemiologists use biostatistics to study the distribution and determinants of health and diseases in populations.

Example

Analyzing data on COVID-19 infection rates, recovery rates and the effectiveness of vaccines involves biostatistical methods.

2. Genetics

Biostatistics is used in genetic research to analyze the inheritance of traits and the association of genetic variations with diseases.

Example

For instance, genetic studies use biostatistics to identify genetic markers linked to diseases like diabetes and cancer.

Median and Mode

Q.9. Write the steps to calculate median and mode.

Ans.

Steps to Calculate Median

- Arrange the data in ascending order.
- If the number of values (n) is odd, the median is the value at the position $(n+1)/2$.
- If the number of values (n) is even, the median is the average of the values at positions $(n/2)$ and $(n/2 + 1)$.

Steps to Calculate Mode

- Count the frequency of each value in the data set.
 - The value with the highest frequency is the mode.
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Bar Chart

Q.10. How can a bar chart be created?

Ans.

Steps to Create a Bar Chart

- Gather the data to be represented in the bar chart.
- Arrange the data into categories and their corresponding values.
- Draw a horizontal axis (x-axis) and a vertical axis (y-axis).
- Label the x-axis with the categories and the y-axis with the values.

- v. Determine the scale for the y-axis based on the range of values in the data set. Divide the axis into equal intervals.
 - vi. For each category, draw a bar with a height corresponding to its value. Ensure the bars are of equal width and are spaced evenly.
 - vii. Label each bar with its category name and value.
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These corrected documents are now ready for printing. All major chemical formula errors, biological inaccuracies, and typographical mistakes have been fixed. The formatting has been standardized for better readability.

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