Exercise

Multiple Choice Questions (MCQs) – Answers with Explanations

1. **What is data?**
   Correct Answer: (b) Raw facts gathered about things.
   Explanation: Data refers to unprocessed facts and figures collected from observations.
2. **Which of the following is an example of qualitative data?**
   Correct Answer: (c) Favourite ice cream flavours.
   Explanation: Qualitative data is non-numerical and describes qualities or categories.
3. **What type of data involves distinct, separate values that are countable?**
   Correct Answer: (c) Discrete Data.
   Explanation: Discrete data consists of separate, countable values like number of students.
4. **What is an example of continuous data?**
   Correct Answer: (b) Height of students in centimetres.
   Explanation: Continuous data can take any value within a range, such as height or weight.
5. **What type of data is used to categorize items without implying any order?**
   Correct Answer: (c) Nominal Data.
   Explanation: Nominal data classifies items without any logical order (e.g., blood types).
6. **How can you organise data to make it easier to analyse?**
   Correct Answer: (b) By creating tables, charts, and graphs.
   Explanation: Organising data visually makes patterns and trends easier to understand.
7. **Which tool can be used to create surveys online?**
   Correct Answer: (b) Google Forms.
   Explanation: Google Forms is a free tool for creating and distributing surveys easily.
8. **What is the main purpose of data collection?**
   Correct Answer: (b) To gather information to answer questions or make decisions.
   Explanation: Data is collected to support analysis and decision-making.
9. **What is the primary purpose of data visualization?**
   Correct Answer: (c) To make data easier to understand by turning it into pictures.
   Explanation: Visuals like graphs and charts help simplify and communicate complex data.
10. **Which tool is specifically designed for creating detailed and interactive visualizations?**
    Correct Answer: (c) Tableau.
    Explanation: Tableau is specialized software for advanced data visualization.
11. **What is the first step in the data science process?**
    Correct Answer: (d) Understanding the problem.

Explanation: Before collecting or analyzing data, one must define the problem clearly.

12. **What does the 'Volume' characteristic of Big Data refer to?**
    Correct Answer: (c) The sheer amount of data being collected.
    Explanation: 'Volume' indicates the large size of data in Big Data systems.

13. **What is an outlier in a dataset?**
    Correct Answer: (c) An unusual or extreme value that doesn't fit the pattern.
    Explanation: Outliers are values that significantly differ from other data points.

14. **What does data encryption do?**
    Correct Answer: (a) It converts data into a code to prevent unauthorized access.
    Explanation: Encryption secures data from unauthorized users.

Short Questions – Comprehensive Answers

1. **What is the difference between qualitative and quantitative data?**
   Answer: Qualitative data describes qualities or characteristics (e.g., colour, type), while quantitative data involves numbers or measurements (e.g., age, height).

2. **Give an example of continuous data and explain why it is considered continuous.**
   Answer: Height of students is continuous data because it can take any value within a range and can be measured more precisely (e.g., 152.3 cm).

3. **Which method would you use to collect opinions from a large group of people about a new school policy?**
   Answer: Online surveys (e.g., Google Forms) would be an effective method as they allow fast and wide data collection.

4. **What type of data is the number of students in your class?**
   Answer: It is discrete data because it consists of whole, countable numbers.

5. **Why is it important to organise data into tables or charts before analyzing it?**
   Answer: Tables and charts help simplify large amounts of data and make it easier to spot trends, patterns, or errors.

6. **What is one advantage of using online tools like Google Forms for collecting survey data?**
   Answer: They automate data collection, offer easy distribution, and organize responses in real time for analysis.

7. **Why might you need to integrate data from different sources when working on a project?**
   Answer: Combining data from multiple sources provides a complete picture and helps make better-informed decisions.

8. **Describe a scenario where discrete data might be more useful than continuous data.**
   Answer: While tracking number of books issued in a library daily, discrete data is more useful since books are countable items.

9. **Explain why data visualization is important. How does it help in understanding complex information?**
   Answer: Visualization turns raw data into understandable visuals, like graphs, helping people quickly grasp insights and trends.

10. **Describe what a line graph is used for and provide an example of data that could be displayed using a line graph.**
    Answer: Line graphs show changes over time. Example: displaying a student's test scores over the academic year.
11. **Explain the use of scatter plots in visualizing continuous data. Provide an example.**
    Answer: Scatter plots show relationships between two variables. Example: plotting study hours vs. test scores to find correlation.

Long Questions – Comprehensive Answers

1. **Explain the differences between qualitative and quantitative data. Provide examples of each type.**
   Answer: Qualitative data describes characteristics, like favourite subject or eye colour. Quantitative data involves numbers, such as test scores or age. Qualitative = descriptive; Quantitative = measurable.
2. **Describe the process of conducting a survey to gather data about students' favourite extracurricular activities.**
   Answer: First, design questions about activities. Then use tools like Google Forms to collect responses. Afterward, organize data into charts or graphs and analyse to see which activity is most popular.
3. **Compare and contrast continuous and discrete data. Use examples to show how each type of data might be used in a school setting.**
   Answer: Discrete data is countable, like number of absentees. Continuous data is measurable and varies smoothly, like student heights. Both help in understanding performance or resources.
4. **Analyse the benefits and challenges of using digital tools like Google Forms for data collection.**
   Answer: Benefits: fast collection, easy sharing, automatic data storage. Challenges: requires internet access, limited to digital literacy, possible technical issues.
5. **Imagine you are tasked with organizing a school event and need to collect data on students' preferences for activities and refreshments.**
   Answer: Use online surveys to ask students about preferences. Analyse responses in charts to plan popular activities and refreshments.
6. **Explain the role of tables and charts in data analysis. Provide an example of how you could use a table or chart to present data about students' grades.**
   Answer: Tables and charts simplify complex data. For example, a bar chart showing grade distribution across subjects helps identify strong and weak areas.
7. **Describe a situation where non-numeric data is essential. How would you collect, store, and analyse this type of data?**
   Answer: Collecting opinions about school uniforms is qualitative. Use open-ended survey questions. Store responses in a document. Analyse by categorizing similar opinions.
8. **Explain the concept of data visualization. How does it help in understanding complex data? Provide examples.**
   Answer: Data visualization converts numbers into visuals like bar charts or pie

3

graphs. Example: showing monthly attendance trends through a line graph for better understanding.

9. **Discuss the importance and benefits of data visualization. Why is it essential for businesses and decision-makers?**
   Answer: Visuals make complex data easy to interpret, enabling quick decisions. Businesses use dashboards and graphs to monitor sales, profits, and customer trends.

10. **Differentiate between nominal, ordinal, discrete, and continuous data. For each type, describe a suitable visualization and example.**
    Answer:

- **Nominal:** Categories with no order (e.g., eye colour). Use pie charts.
- **Ordinal:** Categories with order (e.g., shirt sizes). Use bar charts.
- **Discrete:** Countable values (e.g., number of books). Use column graphs.
- **Continuous:** Measurable values (e.g., weight). Use line or scatter plots.