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Answers Key:

Long Answer Type Questions

1. The six limitations of statistics are explained below

(i) Study of Numerical Facts Only

Statistics is numerical statement of facts. Statistics is not appropriate for the study of qualitative aspects, like honesty, friendship, wisdom, etc. It can be used for measuring quantitative data only.

(ii) Study of Aggregates Only

Statistics is aggregate of facts. It does not study individuals units.

(iii) Homogeneity of Data, an Essential Requirement

The data must be homogeneous and uniform, otherwise the comparisons may not be possible.

(iv) Results are True Only as an Average

Most statistical findings are true only as an average. Hence, the conclusion are of approximate nature. So, statistics as a science is less exact as compared to natural sciences.

(v) Without Reference, Results may Prove to be Wrong

In order to understand the conclusions precisely, it is necessary that the circumstances and conditions under which these conclusions have been drawn are also studied, otherwise they may prove to be wrong.

(vi) Can be Used Only by the Experts

Statistics cannot/should not be used by in experts. This will give rise to the distrust of statistics. Statistics is necessary but at the same time it is imperfect and should therefore be used by experts only.

2. Difference between census survey and sample survey are

Basis	Census Survey	Sample Survey
Coverage	The whole universe is taken for collection of data in census survey.	Only representative sample is taken for collection of data in sample survey.
Suitability	This method is suitable when the area under investigation is relatively small.	This method is suitable when the area under investigation is large.
Accuracy	Since, all items are studied under census survey, highest degree of accuracy is possible.	Since only representative samples are studied under sample survey, it is less accurate.
Time	Census survey is very time consuming as all items are studied.	Sample survey is less time consuming as only samples are studied.
Nature of Items	Census survey is suitable when items in the universe have diverse characteristics.	Sample survey is suitable when items in the universe are homogeneous.
Verification	Under census method the results of invention is generally not possible.	Under sampling method result can be verified by taking out another sample.

3. Bar diagrams come in several types, each suited to different data presentation needs

(i) Simple Bar Diagram Displays a single data set with bars of uniform width, showing values for each category. e.g. It can illustrate the number of students in each grade level.

(ii) Multiple Bar Diagram Compares two or more data sets side by side using grouped bars. An example is comparing monthly income and expenditure.

(iii) Component Bar Diagram Breaks down a total value into parts within a single bar. For instance, it could show a company's budget divided among departments.

(iv) Percentage Bar Diagram Represents parts of a whole as percentages of the total bar length. This is useful for displaying the percentage distribution of student enrollments in various disciplines.

(v) Deviation Bar Diagram

Shows deviations from a baseline with bars extending above and below a central line, such as monthly temperature deviations from an average.

Short Answer Type Questions

4. Non-sampling errors are more serious than sampling errors because a sampling error can be minimised by taking a large sample. But, it is difficult to minimise non-sampling error even by taking a large sample.
5. Differences between classification and tabulation of data are

Basis	Classification	Tabulation
Meaning	Classification of data means that the data is arranged in different classes according to the presence or absence of certain attributes.	Tabulation of data means that the classified data is arranged in rows and columns, under suitable heads and sub heads.
Sequence	Classification precedes the process of tabulation.	Data can be tabulated only after it has been classified
Method or Process	Classification is a method which facilitates statistical analysis.	Tabulation is a process which facilitates the presentation of data by preparing table.
Tool	It is a tool which helps to organise data.	It is a tool which helps in the presentation of data.

6. A component bar diagram displays a complete bar along with its sub-divisions into multiple components, illustrating both the total and the individual parts of the data. Each segment of the bar represents a different component of the whole value and the diagram is useful for showing the composition of the total value. e.g. It can
depict total sales and break downs into various product categories, helping to visualise the contribution of each part to the overall total.
7. Yes, the raw data are very large and difficult to handle. It is difficult to draw meaningful conclusion from them as they do not yield to statistical methods easily. On the other hand, the classified data are comprehensible and concise.
It is easier to draw meaningful conclusion from them. Thus, classified data are better than raw data.
8. A measurable characteristic which takes different values at different points of time and in different circumstances is called a variable.
The difference between discrete variable and continuous variable are

Basis	Discrete Variable	Continuous Variable
Meaning	A variable which can take only integral values is referred to as a discrete variable.	A variable which can take integral values as well as fractional values in a specified range is referred to as continuous variable.
Method of Data Collection	The data related to a discrete variable is collected by counting.	The data related to a continuous variable is collected by measurement.
Change in Value	Discrete variable can change only by integral values.	Continuous variable can change by integral values, as well as, fractional values.

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9. The data represents a continuous variable. Continuous variables are those that can take any value within a specified range, including both whole numbers and
fractions. In this example, the temperature of the city is measured with decimal precision, showing that it can take any value along the continuum within the range of possible temperatures.
Since temperatures can vary by small fractions, this data type reflects the characteristics of a continuous variable, which is capable of assuming an infinite number of possible values within a given interval.

Multiple Choice Question

10. (b) scarce resources
11. (a) scarcity
12. (a) primary data
13. (a) Only I
14. (a) organisation of data
15. (b) Market surveys conducted by a company
16. (d) Identifying shortcomings in the questionnaire
17. (b) Reports of Reserve Bank of India (RBI)
18. (c) Number ofstudents in a class
19. (b) Both II and III