Gujarat Board Textbook Solutions Class 12 Economics Chapter 1 Graphs in Economics

1. Choose the correct option for the following questions :

Question 1. For which type of distribution a diagram is drawn?
(a) Continuous
(b) Discrete/Discontinuous
(c) Skewed
(d) Ideal
Answer:
(b) Discrete/Discontinuous

Question 2. For which type of distribution a graph is drawn?
(a) Continuous
(b) Discrete/Discontinous
(c) Skewed
(d) Ideal
Answer:
(a) Continuous

Question 3. Which of the following diagrams are drawn for similar data?
(a) Simple bar diagram and clustered bar diagram
(b) Bar diagram and pie diagram
(c) Clustered bar diagram and time-series graph
(d) Pie diagram and time-series graph
Answer:
(b) Bar diagram and pie diagram

Question 4. Which of the following statements is true for the internet in the present times?
(a) It is a tool for studying.
(b) Fulfils the role of a teacher in the process of studying.
(c) Is a close substitute for schools.
(d) Is only a tool for entertainment for youth.
Answer:
(c) Is a close substitute for schools.

Question 5. Who/Which type of organization presents data CDs pertaining to economic information?
(a) Private publishers
(b) Schools
(c) Laboratories, research centres, government etc.
(d) Individuals

Answer:
(c) Laboratories, research centres, government etc.

2. Answer the following questions in one line :

Question 1. What is meant by a diagram?
Answer:
Diagram is a representation of the relationship between variables in a picture.

Question 2. What is meant by a graph?
Answer:
It is a picture drawn for complex information which is simplified with the help of statistical tools or for information expressed in continuous frequency which is made presentable with the help of statistical tools.

Question 3. What is meant by a bar diagram?
Answer:
When a data set is distributed among various sections and for each section a bar is drawn on a common base, such that the height of the bar is proportional to the value of the variable for the respective section then such a diagram is called a bar diagram.

Question 4. What is meant by a pie diagram?
Answer:
A diagram which is drawn by representing sub-divisions of an entire data by proplonate degrees ¡n a circle, is called a pie diagram.

Question 5. What is a data CD?
Answer:
A data CD is a CD which consists of collection and publication of information and data pertaining to macroeconomic indicators. This data content in compact disc is sold to researchers and educational institutions.

3. Answer the following questions in brief :

Question 1. What is meant by a diagram and for what purpose it is drawn?
Answer:
Diagram:

- A pictorial representation of observed data is called a diagram.
- Diagram is self-explanatory in nature and can be easily created and understood by anyone.
- Although one needs to make use of scale and measurement to draw a diagram, one does not need to have a thorough knowledge of statistics to draw it.

- A diagram is drawn for data having discrete(discontinuous) frequency distribution. For example, the data could be
  1. No. of children born in a month,
  2. Price in rupees,
  3. No. of road accidents, etc.

Question 2. What is meant by a graph and for what purpose it is drawn?
Answer:
Graph:

- A pictorial representation of observed data is called a graph.
- A graph is drawn for statistical information which is not self-explanatory. In other words, the graph can neither be created nor be understood by people who do not have thorough knowledge of statistics.
- A graph is drawn for data having continuous frequency distribution. For example
  1. Classification of people into various groups based on their incomes,
  2. Division of students on the basis of their marks, etc.

Question 3. State the importance of diagrams and graphs in economics.
Answer:
importance of diagrams and graphs in economics:

1. Economics looks difficult and confusing to learners. Diagrams make economics easy and graphs remove confusion by bringing clarity in data representation.
2. Trends of certain economic parameters over various years can be observed through a single diagram or graph.
3. Graphs and diagrams help to easily understand the changes occurring in various sectors of the economy.
4. One can easily compare the distribution of economic parameters between groups/classes, regions, sectors as well as time periods.
5. When many aspects of economics which are found apparently difficult are presented through a diagram/graph, the time and effort of the presenter in explaining and of the reader fn understanding these aspects is saved.
6. Certain difficult principles of economics are easy to understand with the help of diagrams and graphs. For example, the concepts of expansion and contraction of demand and supply, price elasticity of demand and supply, etc. are made easier by way of pictures. Similarly, the trends of macroeconomic parameters can be clarified by way of time-series graphs.

Question 4. How is computer technology used in the process of learning?
Answer:
Use of technology in the study of economics: The various types of digital tools frequently used in the study of economics are:
Computer technology:

- Computers and economics now go hand in hand.
- Computers are used to solve several purposes of economics. Some of them are discussed below.

1. In making presentations:

- Complicated economic information/data and difficult economic theories can be easily represented by making their PowerPoint presentations.
- For example, if one has to explain the budget briefly then he can simply make a 3 to 4 slides in Microsoft Powerpoint, highlight the main topics, show important figures and charts and explain the entire budget.

2. Excel worksheets:

- Economics deals with lots of data. Researchers come across data having thousands of observations on a daily basis. It is almost impossible to handle so much data manually.
- Microsoft Excel is a powerful tool for handling large data related to several economic parameters and then and performing analysis on it.
- For example, if we survey on number of items produced by small scale industries in India, we would get thousands of observations.
- We can feed this data in excel and get various figures such as total production, average production, number of units in a given region, total exports, etc. within seconds.
- Excel also has numerous types of graphs and diagrams which can be created within a click.

3. Diagrams and graphs:

- There are several programmes in a computer which help us to draw diagrams and graphs used frequently in economics.
- Microsoft Word also offers drawing tools which can be used to draw simple free hand figures like a downward sloping or upward sloping demand or supply curve.
- It can also be used to draft a report, paste diagrams and graphs from Excel and publish the report.

4. Storage tools:

Economic study makes use of large amount of study and reference material. So, it is very important to have enough space where the material can be preserved for a long time.

- Having so much reference and data in the form of books is very cumbersome to carry, study and manage. Moreover, the material may be lost, get damaged by pest, moisture or other reasons.

- All such material can be conveniently stored, retrieved and transported easily if we use electronic media.
  The data and material can be stored computers, portable hard drives, pen drive, compact disc, etc.
  Nowadays the data can also be easily stored in digital format with the help of e-mail, drop-box, Google drive, Digi-locker, etc. we can access this material and read it in any part of the world.
- These media make it quite easy to transfer data, save it securely, preserve it for long time that too at multiple locations.
- Thus, study material can be preserved with the help of computer technology.

5. Other tools:

- Microsoft Excel cannot handle very large amount of data. For this purpose there are various statistical software available which are highly advanced, sophisticated and can handle any size of data.
- SPSS, SHAZAM, E-views, SAS, etc. are few of the such statistical software. -» These software can process data for lakhs of observations that too within seconds or minutes.
  Since these statistical software are very costly, they are mostly bought by research institutes or government organizations.
- There are also certain statistical software like Gretl, PSPP, R, etc. which are available free of cost on the internet but does almost same tasks of analysis as done by the costly software.
- Now-a-days many of these functions of a computer are also available on smart phones and tablets.

Question 5. Write a note on data CD.
Answer:

1. Several authorities and agencies does the task of collection and publication of information and data related to macroeconomic indicators.
2. Since such task require lot of effort and money, these agencies compile such data in compact discs and sell in market.
3. Researchers and educational institutions buy such data CDs for their own research and analysis purpose.
   Example of Data CDs available are:
   - CD of National Income Accounts of India
   - CD of Census of India
   - CD of Annual Survey of Industries in India
   - CD of NSSO (National Sample Survey Organization)
   - Some agencies such as CMIE (Centre for Monitoring Indian Economy) also create data and sell the data CD. They also create software containing important

statistical and economic data. However, these data and CDs are purchased only by research institutes and corporations because these are very expensive.

4. We can avail several CDs containing statistical and economic data from respective ministry. For example, we can get data related to a number of schools and Students studying in Gujarat from the education ministry.

4. Give answers to the point for the following questions :

Question 1. State the important aspects to be considered while drawing a diagram and a graph.

Answer:

Aspects to be considered while drawing a diagram/graph:

1. Choice of type of diagram or graph and their presentation: One should identify and select the most appropriate type of diagram or graph. This would make the picture more effective. For example, for some type of data bar diagram is more suitable over pie diagram.

2. Clarity: The diagram/graph must look neat and clear. Different colors or shades may be used to denote the various sections of the picture.

3. Scales and Measures: Scales must be taken in accordance with the data to have an appropriate size of the diagram/graph.

4. Representation of axis: Both axis of a diagram or graph namely the X-axis and Y-axis must be denoted/represented with appropriate details about what they represent.

5. Data table and source of data: Along with diagrams and graphs one should also give the data table from which these are created. Moreover, one should also provide the source of data. By doing so, the reliability and authenticity of the diagram/graph increases.

6. Method of calculating the data: Sometimes the data is either complex or not in a way we want for our diagram. For example, we may need percentage for our diagram where in the data sheet does not contain a percentage column. When we create a diagram/graph by considering the percentage then we should mention in brief the statistical formulae or method in brief.

Question 2. State the important aspects to be considered while drawing a bar diagram.

Answer:

Aspects to be considered while drawing a bar diagram:

1. The width of the bars does not represent any data. Hence, one should draw all the bars of equal width.

2. The length of the respective bars should be proportional to the value of the variable which they represent.
3. The distance between all bars should be equal. This distance should be also maintained between the first bar and the origin.
4. All bars rest on the same line called the 'base' which usually coincides with the 'X-axis'. In today's times with the help of computer technology, horizontal bars are also drawn instead of vertical bars.
5. All vertical bars should be arranged from left to right in order of the data series. Therefore, the bar representing the first data in the series is drawn first near the point of origin.

Question 3. Give the difference between diagrams and graphs.
Answer:

Diagram	Graph
1. One does not need to have a thorough knowledge of statistics to draw it.	1. One needs to have a thorough knowledge of statistics to draw it.
2. A diagram is drawn for data having discrete(discontinuous) frequency distribution.	2. A graph is drawn for data having continuous frequency distribution
3. It is put before general public for their knowledge about various events.	3. It cannot be put before general public because people cannot understand it without thorough knowledge of statistics.
4. Diagram is self explanatory in nature and can be easily created and understood by anyone.	4. Graph is neither self explanatory nor easy to create. Only researchers or people having thorough knowledge about statistics can create and understand it.
Example: Pictograph, scatter diagram, bar diagram, pie diagram etc	Example: Time series graph, histogram, cumulative frequency polygon and graphs for logarithmic data, etc.

Question 4. Explain the usefulness of internet technology in the process of learning.
Answer:
Internet is a platform that works on digital technology. The use of the internet in economics can be summarized in the following chart.

Purpose of work	The way in which the internet can help
(1) Tutorials	Some educational websites put Powerpoint presentations and study material along with work sheets on the open access i.e. freely available for all link. We can watch and use such presentation as tutorials i.e. for our study purpose. We can get tutorials related to use of statistical software, use of formulae, explanation of economic theories, etc.
(2) Active Learning	Some videos of lectures by experts are put on open access sites by some educational institutions. Some institutions also create live lectures available to students. We can enroll on these sites and we can listen to a lecture on the net like we do in our class room.
(3) Reading material	Numerous books are available online for reading that too free of cost. These materials are called e-books, e-journals, etc. Various research articles, copies of journals, etc. are also available for reading. We can also access some articles, books and journals by paying some annual fees on those websites.
(4) Information	By merely searching, we can get information on universities offering degrees in economics, or any other information about any subject.
(5) Miscellaneous	We can get quotes of economists, names of reference books, etc. on internet by using the search engine.
(6) Data	Economics uses a lot of secondary data. For instance, we use data on budget of a government, on banking, on agricultural production, on value of exports and imports, on poverty, on employment, on industrial production, etc. These data can be accessed from authentic websites. For example, authentic site for data and banking in India is the official website of Reserve Bank of India, for exports and imports is the website of Ministry of Commerce and Industries of Government of India. Budget related information from Ministry of Finance, Government of India and so on. Some organizations and'agencies functioning at national and international levels also collect publish as well as put data on

	websites. For example, CSO NSSO, WHO, UNO, CMIE, ILO, IME, World Bank and so on.

Question 5. Give the caution areas in using computer and internet technologies for studying.
Answer:

- One should never forget that although computer helps in studying, it is not a study material by itself. Computer helps to make the process of studying easier and faster but it does not replace the process of studying.
- One should be able to make wise use of them during their study. One should have good knowledge of computers as well as the statistical tools that we make use in them.
- Computers do not have brain of their own. We may select any data and on one click we may get the diagram and graph we aim for but, it is our duty to see that we select the correct data, give suitable commands and obtain the desired analysis and pictorial representation.
- We may also end up getting incorrect graphs and data processing if we do not know the correct formulae and commands.
- If we do not use the right commands in a computer, we may even end up losing our material.

One should take following care while using internet for education:

- Just like computer, internet is also only a tool. It cannot replace books and teachers or our own thinking and reasoning.
- A lot of bogus material, irrelevant information, misleading information, plagiarized articles are available on internet. We must avoid using such information and material.
- Readers must use their own wisdom to identify if the material given is authentic and reliable or not.
- One must use data or information only from those websites which are authentic and reliable.

Question 6. What is the importance of diagrams and graphs in context of presenting information about economics for lay persons and for experts.
Answer:

- Economic provides an explanation and analysis of various economic events occurring in the real world.
- For studying these events a lot of data is collected. It is then analysed and represented in simpler forms.
- Pictorial representation is a very effective and easy way to represent data analysis.

- Diagrams and graphs are two ways of representing the information pictorially.
- A layman may call diagram and graph as one but Statistics classifies diagrams and graphs as different types of pictures. Both of these are used for distinct purpose. Similarly, even in economics these two are used to fulfill different purposes.
- When we talk about general public or say layman we need to show them such representations which they can understand. Diagrams fulfill this purpose.
- Data understanding and analysis is out of reach and interest of general public. When such information is provided in an easy manner through diagrams then people tend to take interest in them.

Although one needs to make use of scale and measurement to draw a diagram, one does not need to have a thorough knowledge of statistics to draw it. Since drawing the diagram is easy it obviously means that it is easy to understand as well for layman.

- On the other hand graphs are not meant for general public. A graph is drawn for statistical information which is not self-explanatory.
- Layman can neither create not represent graphs without thorough knowledge of statistics. Hence, graphs are mostly used by researchers and in higher education.
- Moreover, graphs are not used or published for general public. They are created by researchers for their data analysis and understanding purposes only.

5. Answer the following questions in detail :

Question 1. Explain the types of diagrams in detail.
Answer:
The various types of diagrams are discussed below:
(1) Time-based line (curve) diagram:

- This diagram is used when we have some time related data. For example, price of a given share in last 30 days, number of vehicles passing through a cross road every hour of a day, growth of population from 1951 to 2001, etc.
- The line-diagram represents the relation between the two economic two variables and the slope.
- Line-diagram can be used for showing the demand curve, supply curve, etc.
- The independent variable (usually, time) is measured on 'X-axis' and the dependent variable is measured on 'Y-axis'.

(2) Bar diagram:
A bar diagram is a chart that uses bars to show comparison between catcyories of data. The bars can be either horizontal or vertical.

Purpose:

- A bar diagram shows distribution of the value of a variable in various sections. For example, literacy rate in a country in various years or literacy rate among females and males in a particular year.
- A vertical or horizontal bar is drawn for each value of the variable.
  A separate bar is drawn for each section and the height/length of the bar indicates the value for that section.
- Thus, by comparing the height/length of the bars a comparison can be made of the values of each section.

Types: Bar diagrams are generally of three types:
(A) Simple bar diagram
(B) Clustered bar diagram
(C) Divided bar diagram.

(A) Simple bar diagram:

- A simple bar diagram is a bar diagram which represents values of only one variable over a base.
- Through simple bar diagram, one can represent data of sale in various regions, months or years, etc.
- The difference in the length of bars gives a visual effect of the difference in the value of the variable under study.

Example:
(B) Clustered bar diagram:
In this type of a diagram, values of a common variable and over a common base are displayed for more than one section of related parameters. Hence we get a cluster of bars for the same variable over various values/sections at the base.

Use in economics:

- Suppose a mobile store owner has two branches. If he wish to compare sales of each branch for a given period of time then he can use clustered bar diagram.
- Other example could be variable 'year' as the base and comparing literacy of two sections namely males and females. This will be a two clustered bar diagram and each pair of bar will show literacy rate of male as well as female.
- To separate the bars properly, the clustered bars are given either different colours or designs. Each value point is then represented on the bar.

(C) Divided bar diagram:

- Divided bar diagram is a bar diagram wherein each bar is divided into several segments to represent a set of quantities according to the different proportions of the total amount.

- In this diagram, every single value of the variable has sub divisions. Hence we get divisions in all the bars which represent a common variable and common base values.
- Each division of the bar is colored differently to distinguish between the divisions. Values are put on each division so that it is easily understood.

(3) Pie-diagram:

- A pie diagram (or a circle chart) is a circular statistical diagram which is divided into slices to illustrate numerical proportion.
- Division of a circle in degrees represents a pie diagram.
- If an entire circle is considered as universal set of an entire data and the different sections of this data are represented by dividing the circle in degrees proportional to the data then a pie diagram is obtained.
- Note that we can draw pie diagram for the similar type of data for which a bar diagrams can be drawn.
- The complete circle represents 360°. Hence, the entire data represents 360° and sections/divisions of the data are represented by dividing the circle in degrees proportional to each data section.

Formula for obtaining proportional degree for a section of data:
Degree = Component value Total value × 360

Question 2. Give an understanding of the usefulness of technology in the study of economics.
Answer:
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