4. Presentation of Data

Answer the following questions, 1 to 4, choosing the correct answer.

Question 1. Bar diagram is a

i. one-dimensional diagram
ii. two-dimensional diagram
iii. diagram with no dimension
iv. none of the above

Answer: i. one-dimensional diagram

Explanation: Bar diagrams are called one-dimensional because it is only the height of the the bars that matters not the width.

Question 2. Data represented through a histogram can help in finding graphically the

i. mean
ii. mode
iii. median
iv. non-of the above

Answer: ii. mode

Explanation: Histogram consists of a set of rectangles adjacent to each other in which each rectangle represents the class interval with the frequency.

Question 3. Ogives can be helpful in locating graphically the

i. mean

ii. mode

iii. median

iv. non-of the above

Answer: iii median

Explanation: Ogive or cumulative frequency curve are constructed by plotting cumulative frequency data on the graph paper, in the form of a smooth curve. The intersection point of two ogive curves i.e. 'less than' and 'more than' ogive curves is called median.

Question 4. Data represented through arithmetic line graph help in understanding

(i) Long term trend

(ii) Cyclicity in data

(iii) seasonality in data

(iv) all the above

Answer: i. long term trend

Explanation: Arithmetic line graphs are also called time series graph. These graphs are used to present the information which is given over a period of time. Here time is plotted on X axis and value of variable on Y axis.

Question 5. State whether the following statements are True or False.

(i) Width of bars in a bar diagram need not to be equal.

(ii) Width of rectangles in a histogram should essentially be equal

(iii) Histogram can only be formed with continuous classification of data.

(iv) Histogram and column diagram are the same method of presentation of data.

(v) Mode of a frequency distribution can be known graphically with the help of a histogram.

(vi) Median of a frequency distribution cannot be known from the ogives.

Answer:

(i) Width of bars in a bar diagram need not to be equal. – <u>False</u>

Reason: In bar diagrams all bars needs to be of equal width and also at equal distance from each other.

(ii) Width of rectangles in a histogram should essentially be equal – <u>False</u>
Reason: Width of rectangles in a histogram may or may not be equal it depends on the width of class intervals.

(iii) Histogram can only be formed with continuous classification of data. – <u>True</u>

Reason: A histogram is never drawn for a discrete variable/data. If the classes are not continuous they are first converted into continuous classes and then histogram is drawn.

(iv) Histogram and column diagram are the same method of presentation of data. – <u>False</u>

Reason: A histogram is a two dimensional diagram with set of rectangles with no spacing in between. On the other hand column (bar) diagram is a one-dimensional diagram with equal space between every Column (bar). Histogram is never drawn for a discrete variable/data whereas column diagram can be drawn for discrete variable/ data.

(v) Mode of a frequency distribution can be known graphically with the help of a histogram. – <u>True</u>

Reason: The highest rectangle of the histogram gives the value of mode of the frequency distribution

(vi) Median of a frequency distribution cannot be known from the ogives. - <u>False</u>

Reason: The intersection point of two ogive curves i.e. 'less than' and 'more than' ogive curves gives the value of median.

Question 6. What kinds of diagrams are more effective in representing the following?

(i) Monthly rainfall in a year.

(ii) Composition of the population of Delhi by religion

(iii) Components of cost in a factory

Answer:

i. Simple bar diagram

Reason: Monthly rainfall in a year is a discrete variable hence it can be best represented by a simple bar diagram with rainfall on Y-axis and months in the year on the X- axis.

ii. Component bar diagram

Reason: Component bar diagrams or sub-divided bar diagrams are to be used, if the total values of the given data are divided into various sub-parts or components. In this case the total population of Delhi can be sub-divided in terms of religion and can be presented by a component bar diagram.

iii. Pie diagram or pie chart

Reason: A pie diagram or circular diagram also know as pie chart represents a circle whose area is proportionally divided into the components which it represents. The components of cost in a factory can be easily represented by the pie chart. The circle will represent the total cost

and different sectors or portions of the circle will represent the various components of cost according to their respective percentage share in total cost.

Question 7. Suppose you want to emphasise the increase in the share of urban non-workers and lower level of urbanisation in India as shown in Example 4.2. How would you do it in the tabular form?

Answer: To showcase the increase in the share of urban non-workers and lower level of urbanisation in India, the data given in the example 4.2 (Case 2, page no.41) can be tabulated as follows:

	Urban areas	Rural areas	Total
Worker population	9	31	40
Non- workers population	19	43	62
Total	28	74	102

From the above table we can see that out of total population of 102 crore, 74 crore people are residing in rural India and only 28 crore people are living in urban areas. This clearly indicates the low levels of urbanisation in the country.

Higher share of urban non-workers can be indicated from the fact that 19 crores people out of total 28 crore population in urban areas are non-working (i.e. 67.85% urban population is non-working), as compared to rural India where 43 crore out of 74 crore people are non- working (i.e. 58.1% of rural population is non-working).

Question 8. How does the procedure of drawing a histogram differ when class intervals are unequal in comparison to equal class intervals in a frequency table?

Answer: Histogram consists of a set of rectangles adjacent to each other in which each rectangle represents the class interval with the frequency.

If the class intervals are of equal width, the area of the rectangles is proportional to their respective frequencies.

However, for some type of data, it is suitable, at times essential, to use varying width of class intervals.

For graphical illustration of such data, height for area of a rectangle is the quotient of height (i.e. frequency) and base (i.e. width of the class interval).

When intervals are equal, i.e. when all rectangles have the same base, area can easily be represented by the frequency of any interval for purposes of comparison.

But when class intervals are unequal i.e., bases vary in width, the frequencies (height of the rectangle) must be adjusted by calculating frequency density i.e. (class frequency divided by the width of the class interval) to yield comparable measurements.

Question 9. The Indian Sugar Mills Association reported that, 'Sugar production during the first fortnight of December 2001 was about 3,87,000 tonnes as against 3,78,000 tonnes during the same fortnight last year (2000). The off-take of sugar from factories during the first fortnight of December 2001 was 2,83,000 tonnes for internal consumption and 41,000 tonnes for export as against 1,54,000 tonnes for internal consumption and nil for exports during the same fortnight last season.'

(i) Present the data in tabular form.

(ii) Suppose you were to present these data in diagrammatic form which of the diagrams would you use and why?

(iii) Present these data diagrammatically.

Answer:

(i) Data in the tabular form is as follows:

Sugar production and off-take in India			
Year	Production (in tones)	Off-take for internal consumption (in tones)	Off take for Exports (in tones)
December 2000	3,78,000	1,54,000	0
December 2001	3,87,000	2,83,000	41,000

Source: The Indian Sugar Mills Association Report

(ii) To present this data in diagrammatic form we will use multiple bar diagrams, because they are used for comparing two sets of data for different classes or years effectively.

(iii) Diagrammatic presentation of the data:
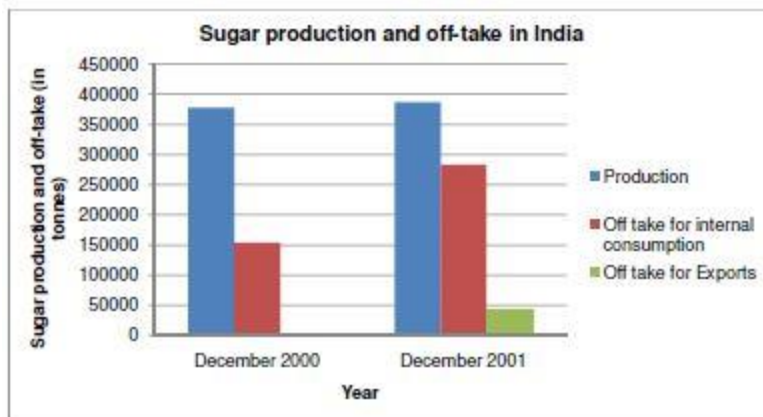
Question 10. The following table shows the estimated sectoral real growth rates (percentage change over the previous year) in GDP at factor cost.

Year	Agriculture and allied sectors	Industry	Services
1994-95	5.0	9.2	7.0
1995-96	-0.9	11.8	10.3
1996-97	9.6	6.0	7.1
1997-98	-1.9	5.9	9.0
1998-99	7.2	4.0	8.3
1999-2000	0.8	6.9	8.2

Represent the data as multiple time series graphs.

Answer

Sectoral real growth rate (in percentage)

	1994 -95	1995 -96	1996 -97	1997 -98	1998 -99	1999 - 2000
Agriculture and allied sectors	5	-0.9	9.6	-1.9	7.2	0.8
Industry	9.2	11.8	6	5.9	4	6.9
Services	7	10.3	7.1	9	8.3	8.2