

3.7

CHAPTER

Bar Diagram

Bar Diagrams

There are mainly six types of Bar Diagrams.

- Simple Bar Diagram
- Multiple Bar Diagram
- Compound Bar Diagram
- Percent Bar Diagram
- Horizontal Bar Diagram
- Floating Bar Diagram, etc.

Advantage

Can represent many different categories. We can directly compare multiple categories.

Disadvantage

Parameters of different entity need to approximate the values.

Simple Bar Diagram

Simple Bar Diagram is similar to Line graph. Only one set of data can be represented in simple Bar Diagram. It is different to Line graph only in an aspect that in place of points there are bars which represent values of respective years.

Ex. 1

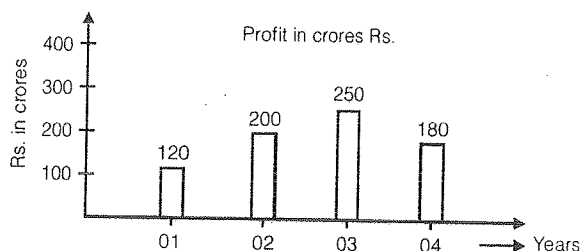


Fig. (1) Balance Sheet of MTS incorporation

Sol.: From the Bar Diagram given in Fig. (1) We can determine following things

1. Percent increment in profits

$$2001 - 02 \Rightarrow \frac{80}{120} \times 100 = 66.66\%$$

$$2002 - 03 \Rightarrow \frac{50}{200} \times 100 = 25\%$$

$$2003 - 04 \Rightarrow \frac{-70}{250} \times 100 = -28\%$$

(- Sign indicates decrement)

- Maximum increase in profit was observed in financial year 2001-02.
- Minimum increase in profit was observed in financial year 2003-04.

$$2. \text{ Average profit} = \frac{120 + 200 + 250 + 180}{4} = \frac{750}{4} = 187.5 \text{ crore}$$

3. Annual average growth rate from 2001-2004

$$= \frac{180 - 120}{120} \times \frac{100}{3} = \frac{60}{120} \times \frac{100}{3} = 16.66\%$$

Multiple Bar Diagram

In Simple Bar Diagrams only one set of data can be represented. To represent multiple set of data for different years we use multiple bar diagrams.

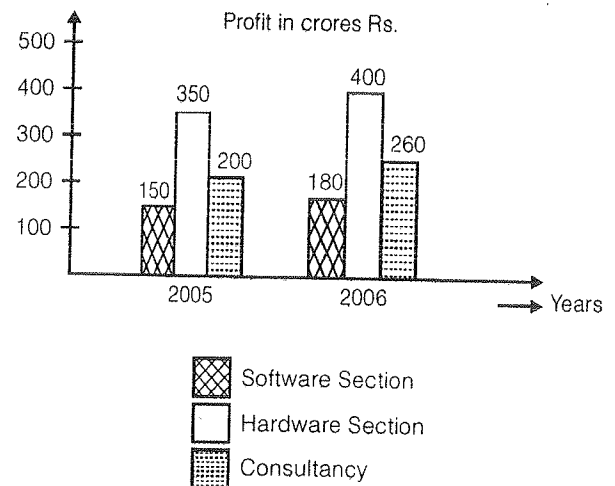


Fig. (2) Balance Sheet of Megha-soft for two financial years 2005 and 2006.

From the multiple bar diagram shown in Fig. (2) we can calculate following things

1. Sectional Growth

(a) Software section $180 - 150 = 30 \text{ Cr.}$

(b) Hardware section $400 - 350 = 50 \text{ Cr.}$

(c) Consultancy $260 - 200 = 60$ Cr.

- Highest absolute increase in profit is observed by consultancy section.
 - Minimum absolute increase in profit is observed by software section
2. Growth rates in percent terms.

$$\text{Software section} \Rightarrow \frac{180 - 150}{150} \times 100 = 20\%$$

$$\text{Hardware section} \Rightarrow \frac{400 - 350}{350} \times 100 = 14.28\%$$

$$\text{Consultancy} \Rightarrow \frac{260 - 200}{200} \times 100 = 30\%$$

- Minimum growth is observed by Hardware section
 - Maximum growth is observed by consultancy section.
3. Growth rate of megha soft for the duration 2005-06.

$$\begin{aligned} & \frac{\text{Profit in 2006} - \text{Profit in 2005}}{\text{Profit in 2005}} \times 100 \\ \Rightarrow & \frac{(180 + 400 + 260) - (150 + 350 + 200)}{(150 + 350 + 200)} \times 100 \\ \Rightarrow & \frac{840 - 700}{700} \times 100 \\ = & \frac{140 \times 100}{700} = 20\% \end{aligned}$$

Compound Bar Diagram

Compound Bar Diagrams are similar to Multiple Bar Diagrams. The only difference between these two Bar Diagrams is that in Compound Bar Diagram a single Bar Diagram is subdivided into different parts, while multiple bars are used in Multiple Bar Diagrams. Compound Bar Diagrams are also known as sub-divided Bar Diagrams.

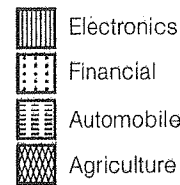
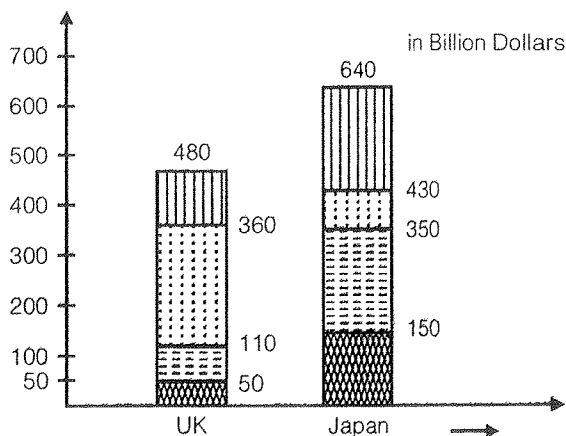


Fig. Export Basket of two countries
UK and Japan for year 2005 in \$ billion

From the Compound Bar Diagram we answer following set of questions.

Ex. 1. Export of Agriculture product of UK is how much percent of export of Automobile product of Japan?

Sol. Export of Agriculture product of UK
= \$ 50 billion
Export of Automobile product of Japan
= \$ 200 billion
 $= \frac{50}{200} \times 100 = 25\%$

Ex. 2. Export of Automobile product of Japan is how many times of automobile product.

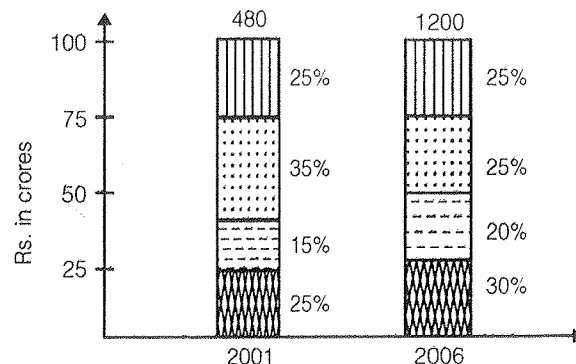
Sol. Automobile Export of Japan
= \$ 200 billion
Automobile Export of UK = \$ 60 billion
 $\frac{260}{60} = \frac{10}{3} = 3.33 \text{ times}$

Ex. 3. Total export given in Fig. of Japan is how much percentage higher than that of UK?

Sol. $= \frac{640 - 480}{480} \times 100$
 $= \frac{160}{480} \times 100 = 33.33\%$

Percent Bar Diagram

Percent Bar Diagram is similar to Compound Bar Diagram. The only difference is that the total height of each bars are equal and represent hundred percent in percent bar diagram, whereas heights of different bars in compound bar diagram may or may not be equal.



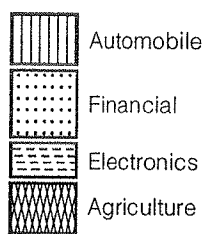


Fig. Export Basket of XYZ for financial year 2001 and 2006 in billion dollars.

From the above figure we can calculate following things.

- (1) Percent increment in export for the given duration 2001-06

$$\frac{1200 - 480}{480} \times 100 = 150\%$$

- (2) Export of Japan for financial year 2001 consist of

- \$ 120 billion for Automobiles
- \$158 billion for Financial services
- \$ 72 billion for Electronic Goods
- \$120 billion for Agriculture product

- (3) Export Basket of Japan for financial year 2006 consists of

- \$ 360 billions for Automobiles
- \$ 300 billion for Financial services
- \$ 240 billions for Electronic goods
- \$ 300 billion for Agriculture product

- (4) Export of financial services in year 2006 is how many times more than export of electronic goods in 2001?

Sol. Export of financial services in 2002 = 300

Export of electronic goods in 2001 = 72

$$\frac{300 - 72}{72} = 3.16 \text{ times approx.}$$

Horizontal Bar Diagrams

Horizontal Bars are similar to simple bar diagrams. The only difference is that in case of horizontal bar, representation is horizontal, whereas vertical bars are used for simple bar diagram. Horizontal bar diagram is used in cases when we requires to represent data sets for comparatively large number of years. All the calculation and observation of both the Bar Diagrams are similar.

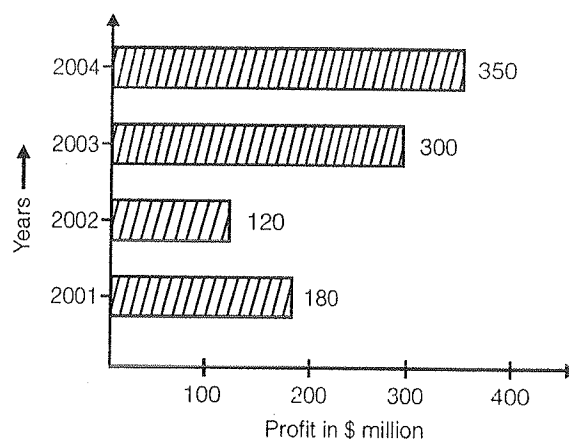


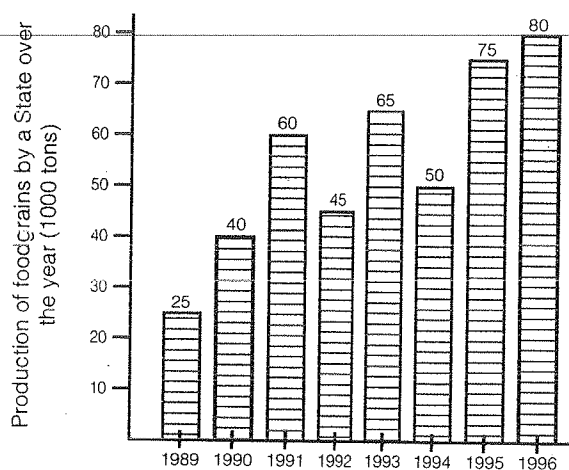
Fig. (5) Profits of Tamasha.com for four consecutive financial year.

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Practice Exercise: I

Direction (Qs. 1 to 5): Study the following graph carefully and answer the questions given below:

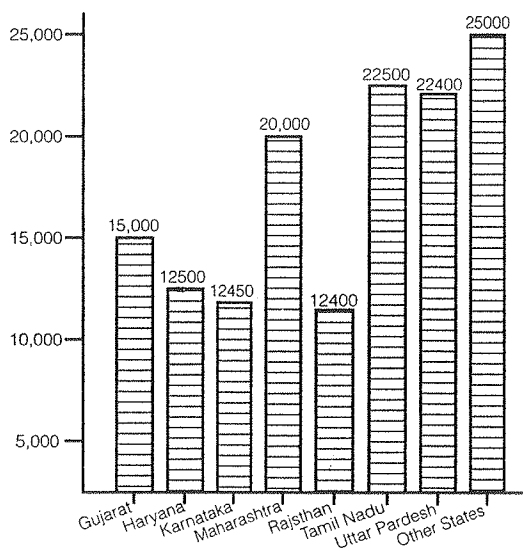


1. The average production of 1990 and 1991 was exactly equal to the average production of which of the following pairs of years?
 - (a) 1991 and 1992
 - (b) 1992 and 1994
 - (c) 1993 and 1994
 - (d) None of these
2. What was the difference in the production of foodgrains between 1991 and 1994?
 - (a) 10000 tons
 - (b) 15000 tons
 - (c) 500 tons
 - (d) 5000 tons

3. In which of the following years was the percentage increase in production from the previous year the maximum among the given years?
 (a) 1991 (b) 1993
 (c) 1995 (d) 1990
4. In how many of the given years was the production of foodgrains more than average production of the given years?
 (a) 2 (b) 3
 (c) 4 (d) 1
5. What was the percentage drop in the production of foodgrains from 1991 to 1992?
 (a) 15 (b) 20
 (c) 25 (d) 30

Direction (Qs. 6 to 10): Study the following graph carefully and answer the questions given below :

Rose Production

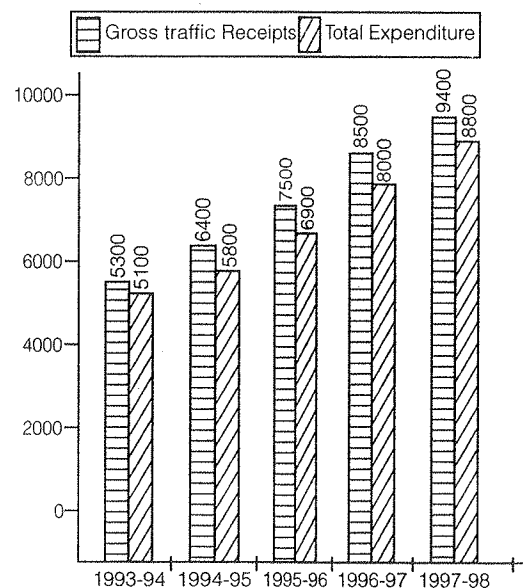


6. Which of the following State(s) contribute(s) less than 10 % in the total rose production?
 (a) Only Rajasthan
 (b) Rajasthan, Karnataka
 (c) Rajasthan, Karnataka, Haryana
 (d) Rajasthan, Karnataka, Haryana and Gujarat
7. By what percentage rose production of other States is more than that of the Maharashtra?
 (a) 25 (b) 30
 (c) 20 (d) 15
8. What is the approximate average production of roses (in thousands) across all the states?
 (a) 21 (b) 20
 (c) 19 (d) 18

9. Approximately what percentage of the total rose production is shared by the other States?
 (a) 12.5 (b) 17.5
 (c) 19.5 (d) 22.5
10. If total percentage contribution of the States having production of roses below twenty thousand is considered, which of the following statement is true?
 (a) It is little above 40%
 (b) It is approximate 36.8%
 (c) It is below 35%
 (d) It is little below 30%

Direction (Qs. 11 to 15): These questions are based on the following bar graph. Read the graph and answer the questions

Finances of XYZ Railway



11. What is the percentage increase in the gross traffic receipts in 1995-96 as compared to 1993-94?
 (a) 33.9% (b) 29.3%
 (c) 20.7% (d) 17%
12. If profit = gross traffic receipts - total expenditure, then in 1996-97 what percentage of gross traffic receipts is the profit made?
 (a) 5.9% (b) 6.4%
 (c) 7.2% (d) 8%
13. In which year was the profit as a percentage of gross traffic receipts the highest?

- (a) 1997-98 (b) 1996-97
(c) 1995-96 (d) 1994-95

14. In order to make a profit of 10%, what should have been the gross traffic receipts (in Rs. crore) in 1994-95, total expenditure remaining the same?

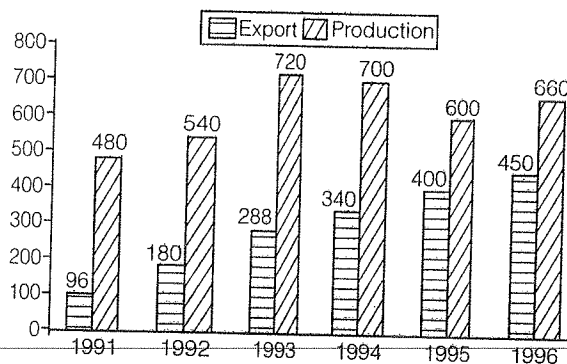
- (a) 5667 (b) 5876
(c) 6444 (d) 7667

15. By what amount (in Rs. crore) has the expenditure increased over the period 1993-94 to 1997-98?

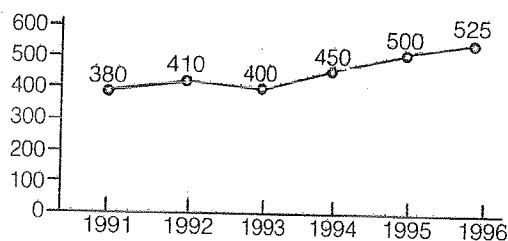
- (a) 4100 (b) 3900
(c) 3850 (d) 3700

Direction (Qs. 16 to 20): Study the following graph to answer these questions:

Tea in India (in million kg)



Per Capita Availability in gm



16. Which year shows the maximum percentage of export with respect to production?

- (a) 1992 (b) 1993
(c) 1996 (d) 1995

17. Assuming that entire quantity is consumed after export, the population of India in 1993 was

- (a) 800 million (b) 1080 million
(c) 985 million (d) 900 million

18. The proportion of tea exported to the tea production over the entire period

- (a) 0.87 (b) 0.47
(c) 0.58 (d) 0.66

19. In which year, there was minimum percentage of export with respect of production?

- (a) 1991 (b) 1992
(c) 1993 (d) 1994

20. In which year we had maximum quantity of tea for domestic consumption

- (a) 1994 (b) 1991
(c) 1993 (d) 1996

□□□□

Solutions

Answer 1 to 5:

1. (d)
2. (a) Required difference
 $= 60 - 50 = 10,000$ tonne.
3. (d) Percentage increase in production in 190 is height given by
 $= \frac{15}{25} \times 100 = 60\%$

4. (c) Average production
 $= \frac{25 + 40 + 60 + 45 + 65 + 50 + 75 + 80}{8}$
 $= \frac{440}{8} = 55.$

More than the average in 4 years namely 91, 93, 95, 96.

5. (c) Required percentage drop
 $= \frac{60 - 45}{60} \times 100 = 25\%$

6. (c) Total rose production
 $= (15 + 12.5 + 12.45 + 20 + 12.4 + 22.4 + 22.5 + 25) \times 1000 = 142250$
Percentage production of rose in the 3 States (is lower than 10%)
Rajasthan Karnataka Haryana
8.71% 8.75% 8.78%

7. (a) Required percentage

$$= \frac{25 - 20}{20} \times 100 = 25\% \text{ (more)}$$

8. (d) Total production of rose by all the states = 142250

$$\therefore \text{Average} = \frac{142250}{8 \times 1000} = 18 \text{ (thousand)}$$

9. (b) Required percentage

$$= \frac{25}{142.25} \times 100 \approx 20\%$$

10. (b) It is 36.8% approximately.

11. (b) $\frac{7500 - 5300}{7500} \times 100 = 29.33\%$

12. (a) $\frac{8500 - 8000}{8500} \times 100 = 5.88\%$

13. (d)

14. (c) Let GTR be Rs. x

$$\therefore x - x \times 10\% = 5800$$

$$\therefore x = \frac{5800 \times 10}{9} = \text{Rs. } 6444.4$$

15. (d) $8800 - 5100 = 3700$.

16. (c) As per options

In 1992, $\frac{180}{540} \times 100 = 33\frac{1}{3}\%$

In 1993, $\frac{288}{720} \times 100 = 40\%$

In 1995, $\frac{400}{600} \times 100 = 66.66\%$

In 1996, $\frac{450}{660} \times 100 = 68.18\%$

17. (b) $720 - 288 = 432$ million = Total consumption of tea in 1993

$$\text{Population of India} = \frac{432}{0.4} = 1080 \text{ million.}$$

18. (d) Average tea exported during 1991–1996 = 1754 million kg. Average tea produced during 1991–1996 = 3700 million kg

$$\therefore \text{Required ratio} = \frac{1754}{3700} = 0.47.$$

19. (a)

20. (c)

In 1991, $480 - 96 = 384$ million tonnes

In 1993, $720 - 288 = 432$ million tonnes

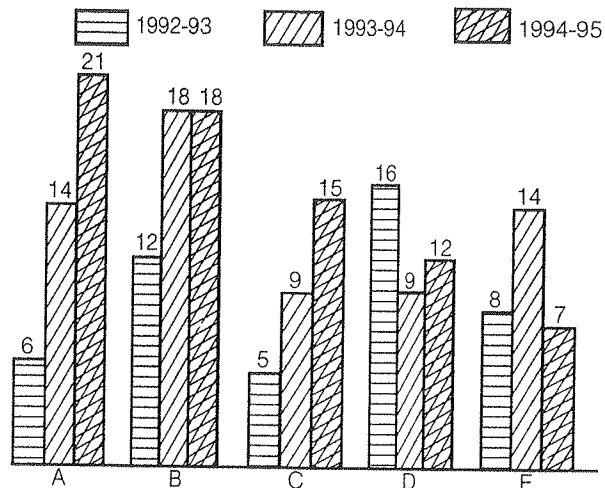
In 1994, $700 - 340 = 360$ million tonnes

In 1996, $660 - 450 = 210$ million tonnes



Practice Exercise: II

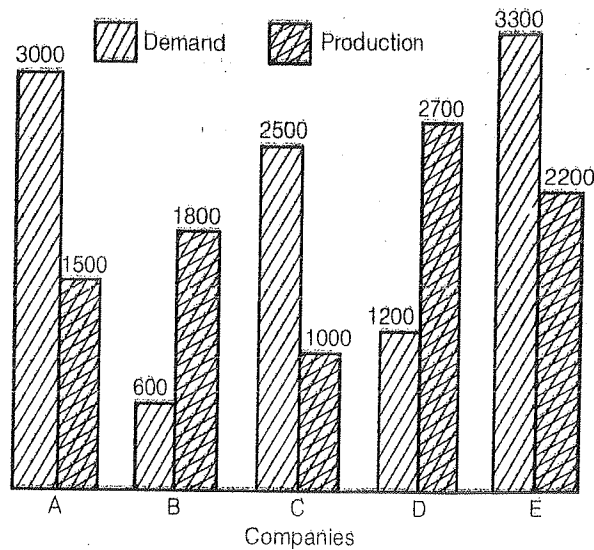
Direction (Qs. 1 to 5): Study the diagram carefully and answer the questions given below it



Cotton production of some states in ,000 tonnes

- The production of state D in 1993-94 is how many times its production in 1994-95?
(a) 1.33 (b) 0.75
(c) 0.56 (d) 1.77
- In which of the states there is a steady increase in the production of cotton during the given period?
(a) A & B (b) A & C
(c) B only (d) D & E
- How many tonnes of cotton was produced by state E during the given period?
(a) 2900 (b) 29000
(c) 290000 (d) 29000000
- How many states showing below average production in 1992-93 showed above average production in 1993-94?
(a) 4 (b) 2
(c) 3 (d) 1
- Which of the following statement is in false?
(a) States A and E showed the same production in 1993-94
(b) There was no improvement in the production of cotton in state B during 1994-95.
(c) State A has produced maximum cotton during the given period
(d) Production of States C and D together is equal to that of state B during 1993-94

Direction (Qs. 6 to 10): Study the diagram carefully and answer the question given below it



6. What is the ratio of companies having more demand than production to those having more production than demand?
 - (a) 2 : 3
 - (b) 4 : 1
 - (c) 2 : 2
 - (d) 3 : 2
7. What is the difference between average demand and average production of the five companies taken together?
 - (a) 1400
 - (b) 400
 - (c) 280
 - (d) 138
8. The production for company D is approximately how many times that of production of company A?
 - (a) 1.8
 - (b) 1.5
 - (c) 2.5
 - (d) 1.11
9. The demand for company B is approximately what percent of the demand for company C?
 - (a) 4
 - (b) 24
 - (c) 20
 - (d) 60
10. If company A desires to meet the demand by purchasing T.V. sets from a single company, which one of the following companies can meet the need adequately?
 - (a) B
 - (b) C
 - (c) D
 - (d) None of these

Direction (Qs. 11 to 15): Study the following bar charts (Figs) before answering the questions.

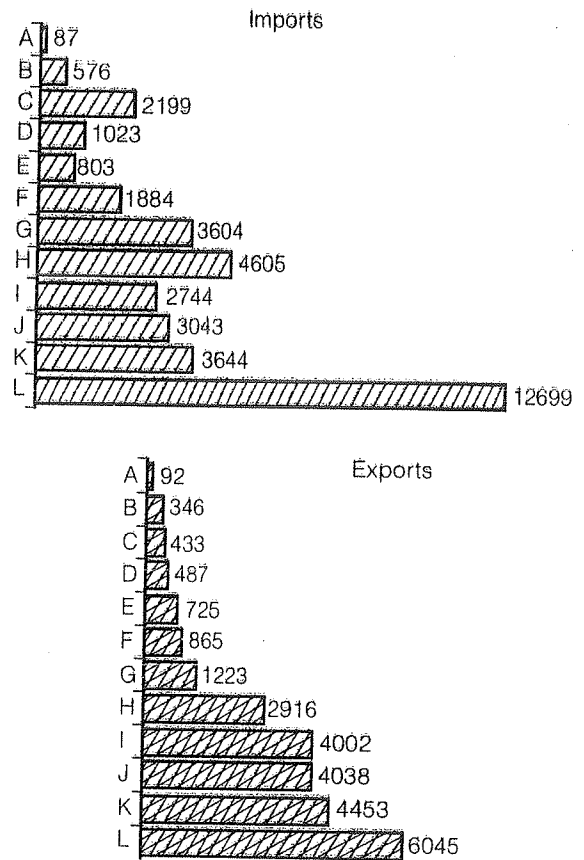
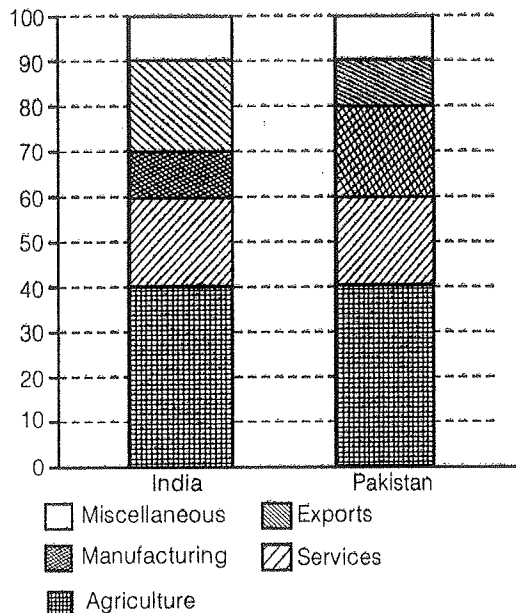


Fig. Foreign Trade by countries for year 1993-94

11. How many countries exhibited a trade surplus?
 - (a) 5
 - (b) 4
 - (c) 3
 - (d) 6
12. The highest trade deficit was shown by which country?
 - (a) C
 - (b) G
 - (c) G
 - (d) L
13. The ratio of Exports to Imports was highest for which country?
 - (a) A
 - (b) I
 - (c) J
 - (d) K
14. The total trade/surplus for all the countries put together was?
 - (a) 11286 surplus
 - (b) 11286 deficit
 - (c) 10286 deficit
 - (d) None of these
15. The ratio of the maximum exports to the minimum imports was closest to
 - (a) 64
 - (b) 69
 - (c) 74
 - (d) None of these

Direction (Qs. 16 to 20): Shows the compositions of the GDP of two countries (India and Pakistan).



16. What fraction of India's GDP is accounted for by services?

- (a) $\frac{6}{33}$ (b) $\frac{1}{5}$
(c) $\frac{2}{3}$ (d) None of these

17. If the total GDP of Pakistan is Rs. 10,000 crore, then the GDP accounted by Manufacturing is

- (a) Rs 200 crore (b) Rs 600 crore
(c) Rs 2,000 crore (d) Rs 6,000 crore

18. The total GDP of India is Rs 30,000 crores, then the GDP accounted for By Agriculture, Services and Miscellaneous is

- (a) Rs. 18,500 crore (b) Rs 18,000 crore
(c) Rs. 21,000 crore (d) Rs. 15,000 crore

19. Which country accounts for higher earning out of Services and Miscellaneous together?

- (a) India
(b) Pakistan
(c) Both spend equal amounts
(d) Cannot be determined

20. If the total GDP is the same for both the countries then what percentage is Pakistan's income through agriculture more than India's income through services?

- (a) 100% (b) 200%
(c) 133.33% (d) None of these

Solutions

Answer 1 to 5:

1. (b) Let production of D in 1993-94 be K
× (production of D in 1994-95).

Then, 9 lakhs = $k \times 12$ lakhs

$$\text{or } k = \frac{9}{12} = \frac{3}{4} = 0.75.$$

2. (b) Clearly, there is a steady increase in the production of cotton during the given period in case of states A and C.

3. (b) $(8 + 14 + 7) \times 1000 = 29000$ tonness

4. (b)

5. (c) During the given period, state B has produced 48000 tonnes while state A has produced only 41000 lakhs tonnes.

Hence, statement (c) is false

6. (d) The companies having more demand than production are A, C, E. Their number is 3. The companies having more production than demand are B and D. Their number is 2.

7. (c) Average demand

$$= \left(\frac{3000 + 600 + 2500 + 1200 + 3300}{5} \right)$$

$$= 2120.$$

Average production

$$= \left(\frac{1500 + 1800 + 1000 + 2700 + 2200}{5} \right)$$

$$= 1840.$$

∴ Difference in having average demand & production = $(2120 - 1840) = 280$.

8. (a) Let production of D
= $k \times$ production of A

$$\text{Then, } 2700 = k \times \frac{2700}{1500} = 1.8.$$

9. (b) Let $x\%$ of demand for C = Demand for B.

$$\text{Then, } \frac{x}{100} \times 2500 = 600$$

$$\text{or } x = \left(\frac{600 \times 100}{2500} \right) = 24\%$$

10. (c) Since D produces highest number of sets and A desire to meet the demand by purchasing surplus sets from a single company, So, D can meet the demand of A.

11. (b) Out of a total of 12 countries, 8 showed a deficit while 4 showed a surplus.
12. (d) Visually it is clear that L has highest trade deficit.
13. (b) I has a ratio of $4002/2744 = 1.45$, which is the highest.
14. (b) Sum of exports-sum of imports = deficit (11286)
15. (b) 6045/87
16. (b) Service accounts for 20%, i.e., $1/5^{\text{th}}$ of the GDP of India
17. (c) $20\% \text{ of } 10000 = 2000$
18. (c) $(40 + 20 + 10) \% \text{ of } 30,000 = \text{Rs. } 21,0000 \text{ crore.}$
19. (d) Although the percentage on Service and Miscellaneous put together is equal for both the countries, but we cannot comment on this since we have no data about the respective GDPs.
20. (a) Since the GDP is same, the answer will be got by $(40 - 20)/20 = 100\%$

