CHAPTER 18

Data Interpretation

Data Interpretation as the same suggests tests your skills to understand data presented in different forms like bar graphs, tables, charts, line graphs etc.

The questions are given with a set of data and candidate is required to deduce the required results from the set of data.

In this section, the most important thing that an individual must be able to do is to calculate fast and accurately.

Adequate practice should generally set an individual well known about the course for cracking this section.

Objectives of Data Interpretation-

The objectives of data interpretation is as follows:

1.To test the analytical ability of the candidate.

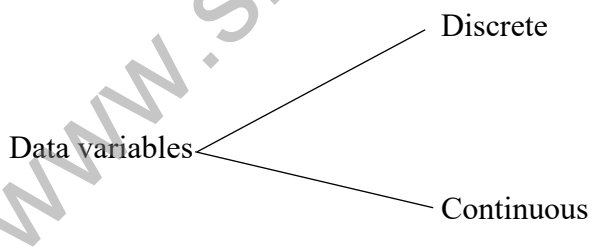
2.Examine the candidate's ability to derive the useful Information from a bulk of information.

3.Testing the decision making ability from a given situation.

4.Ability to check the data usability to find the solution of a problem.

Data Interpretation- It can be defined as applying statistical procedure to analyze specific facts from a study or body of research.

Data- It is the term used to refer to the row numbers(facts and figures).



Generally, in DI, questions are asked in exams on the following topics

1. Pie chart/ Circle graph
2. Bar chart
3. Line graph

1. Pie Chart/Circle Graph- Pie chart is a special technique of data represented in the form of circle. It is divided into various sections or sector, each representing a different category and shows the portion of entire pie chart. In this, data can be plotted with respect to only one parameter.

Pie charts are useful for representing:

(i) percentage of various elements with respect to total quantity.

(ii) proportions of various elements with respect to total quantity.

(iii) shares of various elements for a particular quantity.

Note: In the questions of pie chart, the total quantity distributed over a total angle of 360°.

2. Bar Chart- It is a chart with rectangular bars with length proportional to the value which they represent. In this method of data representation, the data is plotted as bars on the X and Y-axes, where X-axis represents a discreate variable and Y-axis represents the scale for the variables.

Following are the various bar charts:

(i) Simple Bar Chart This type of chart relates to only one variable.

(ii) Subdivided Bar Chart This chart is used for represent various parts of the total magnitude of a given variable.

(iii) Multiple Bar Chart In this, two or more bars are constructed adjoining to each other to represent either different components of a total or to show multiple variables.

3.Line Graph- It indicates the variation of a quantity with respect to the two parameters plotted on X and Y-axes. Line graph simplifies the data as it gives a pictorial representation of data and then it is very useful in determining the trends and rate of change.

Types of Line Graph:

Single Line Graph- Used for single variable representation.

Multiple Line Graph- Used for more than one variable representation.

Important Points-

Slope of graph represents the absolute growth and not the percentage growth.

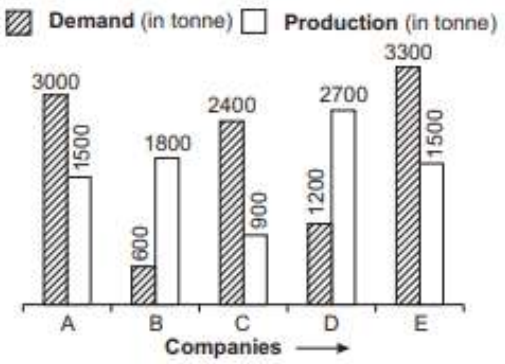
Simple average growth is found out by simple interest method.

Cumulative average growth rate is found by compound interest method.

Cumulative average growth is different from simple average growth in the sense that simple average growth is the growth between two points of time.

Solved Examples:

Directions (Q. Nos. 1 and 2) The following graph shows the demand and production of cotton by 5 companies A, B, C, D and E. Study the graph and answer the given questions.



1. 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) 3 : 2 (d) 1 : 4

Sol. (c) Required ratio = 3 : 2

2. What is the difference (in tonne) between average demand and average production of the five companies taken together?

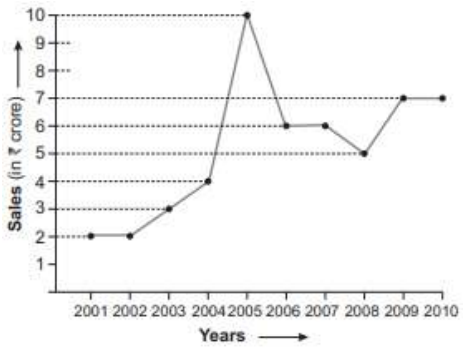
(a) 320 (b) 420 (c) 2100 (d) 1050

Sol. (b) Required difference

$$= \left(\frac{3000 + 600 + 2400 + 1200 + 3300}{5}\right) - \left(\frac{1500 + 1800 + 900 + 2700 + 1500}{5}\right)$$

= 2100 – 1680 = 420 tonne

Directions (Q.Nos. 3 and 4) The following line diagram represents the yearly sales figures of a company in the years 2001-2010. Examine the diagram and answer the questions.



3. By what per cent did the sales in 2008 decrease in comparison to the sales in 2006?

(a) 20 (b) 18 (c) $16\frac{2}{3}$ (d) $15\frac{2}{3}$

Sol. *(c)* Percentage decrease $= \left(\frac{6-5}{6} \times 100\right) = \frac{50}{3}\% = 16\frac{2}{3}\%$

4. The ratio of sales in 2002 to that in 2007 is

(a) 2 : 3 (b) 1 : 3 (c) 1 : 1 (d) 3 : 2

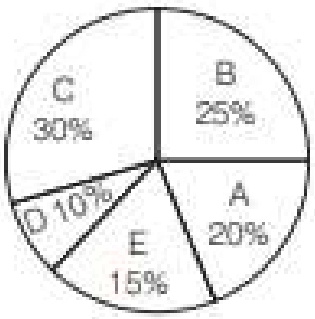
Sol. (b) Required ratio = 2 : 6 = 1 : 3

Practice Questions

1. The line graph below shows the number of houses sold each month by a real estate agent for the first six months of the year. Between which two months did sales increase the most?

(a) April-May (b) May-June (c) January-February (d) March-April

2. The pie-diagram shows the expenditure incurred on the preparation of a book by a publisher, under various heads.



A. Paper 20%

B. Printing 25%

C. Binding etc., 30%

D. Miscellaneous 10%

E. Royalty 15%

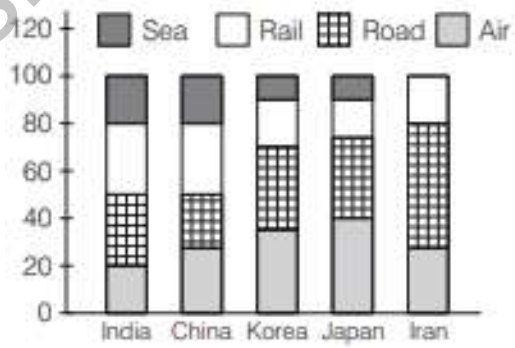
Which two expenditures together will form an angle of 108° at the centre of the diagram?

(a) A and D (b) D and E (c) A and E (d) B and E

3. Study the following in formation carefully and answer the question given below.

Percentage share of goods transported through Air, Road, Rail and Sea in five countries India, China, Korea, Japan, Iran.

Given the total weight of goods transported in the 5 countries in a year are 1086, 3140, 1855, 2360 and 1465 thousand tonne respectively.

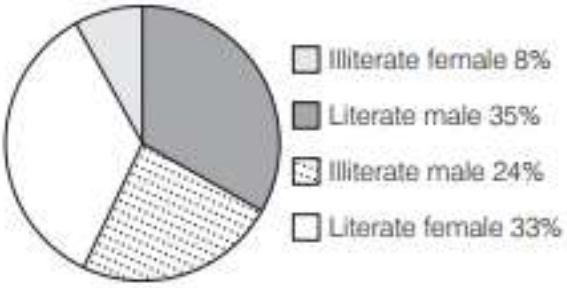


Which country transported the maximum quantity of goods by road?

(a) Iran (b) Japan (c) China (d) Korea

4. Study the following pie chart carefully and answer the question given below.

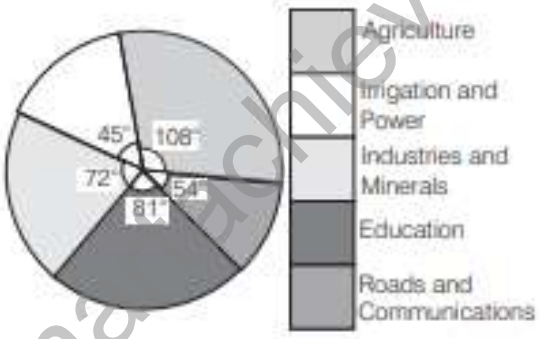
Percentage of literate and illiterate males and females in a city having a population 250000



What is the difference between the number of literate males and literate females?

(a) 5000 (b) 500 (c) 75000 (d) 1500

Directions (Q. Nos. 5 and 6) The adjoining pie chart represents the proposed outlay of the fifth-five years plan of Rs.40000 (in crores). Examine the chart and answer the questions.



5. The amount proposed on agriculture is more than that on industries and minerals by

(a) 7.5% (b) 10% (c) 12% (d) 12.5%

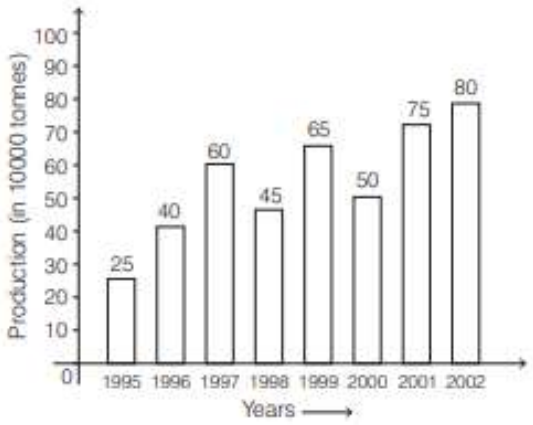
6. The amount (in Rs. crore) proposed on irrigation and power is less than that on industries and minerals by

(a) 3000 (b) 3500 (c) 2000 (d) 2500

Directions (Q. Nos. 7-10) Study the following graph and give the answers of the following questions.

Production of Fertilizers by a Company

(in 10000 tonne) Over the Years 1995-2002



7. What was the percentage decline in the production of fertilizers from 1997 to 1998?

(a) $33\frac{1}{3}$ (b) 30 (c) 25 (d) 20

8. In how many years was the production, fertilizers more than the average production of the given years?

(a) 1 (b) 2 (c) 3 (d) 4

9. In which year was the percentage increase in production as compared to the previous year, the maximum?

(a) 2002 (b) 2001 (c) 1996 (d) 1997

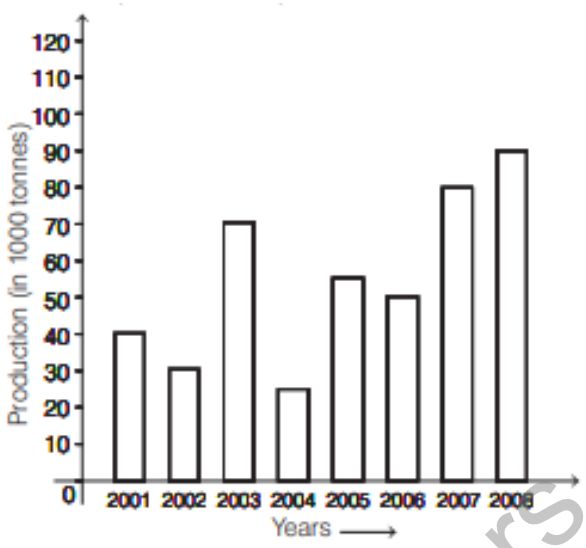
10. The ratio of total production of fertilizers in the years1996 and 1997 to that of total production in the years 1995, 1998 and 2000 is

(a) 5 : 6 (b) 6 : 5 (c) 20 : 29 (d) 13 : 24

Directions (Q. Nos. 11-14) Study the following graph and answer the questions given below.

Production of Salt by a Company

(in 1000 tonne) Over the Years



11. What was the percentage increase in production of salt in 2008 compared to that of 2001?

(a) 55.5 (b) 125 (c) 150 (d) 220

12. In how many of the given years was the production of salt more than the average production of the given years?

(a) 1 (b) 2 (c) 3 (d) 4

13. The average production of 2004 and 2005 was exactly equal to the average production of which of the following pairs of years?

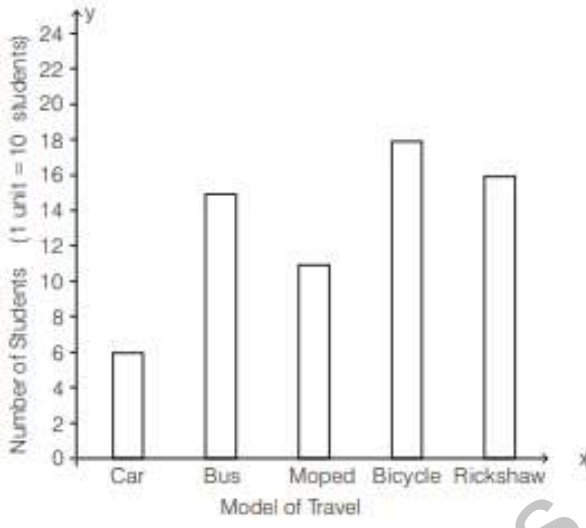
(a) 2006, 2007 (b) 2005, 2006 (c) 2002, 2006 (d) 2001, 2005

14. What was the percentage decline in the production of salt from 2003 to 2004?

(a) 64.2 (b) 180 (c) 62.4 (d) 10

Directions (Q. Nos. 15-18) The following bar diagram represents the use of different modes of travel to school by students in a certain locality of the town.

Study the graph and answer the questions.



15. How many students are coming from that locality?

(a) 500 (b) 600 (c) 560 (d) 660

16. How many students use Bicycle and Rickshaw combined?

(a) 240 (b) 340 (c) 140 (d) 440

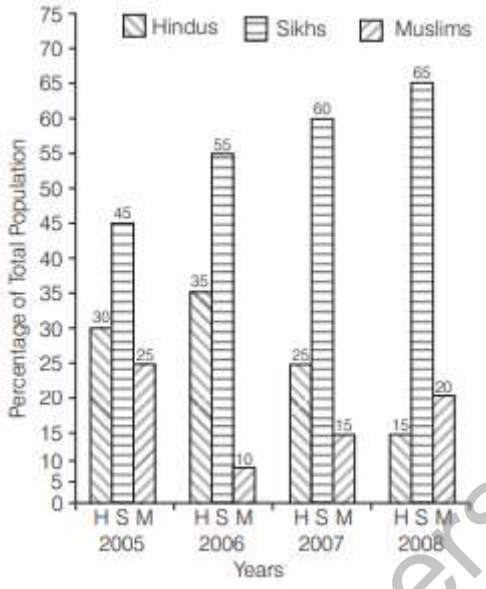
17. What is the percentage of students using Bus from that locality?

(a) $22\frac{14}{33}$ (b) $18\frac{2}{9}$ (c) $22\frac{8}{11}$ (d) 22

18. What is the ratio of the students using their means of transport as Car with those using Rickshaw?

(a) 7 : 2 (b) 8 : 3 (c) 2 : 7 (d) 3 : 8

Directions (Q. Nos. 19-22) The following diagram shows the percentage of population of Hindus, Sikhs and Muslims with respect to total population in a town during 2005 to 2008. Study the diagrams and answer the question.



19. If the total population in 2007 was 80 lakhs, then the number of Hindus in 2007 was (in lakh)

(a) 25 (b) 16 (c) 18 (d) 20

20. Percentage decrease in Hindu population from 2005 to 2008 is

(a) 50 (b) 40 (c) 25 (d) 15

21. Difference of percentage of population of Hindus in 2005 and 2008 is

(a) 20 (b) 15 (c) 25 (d) 30

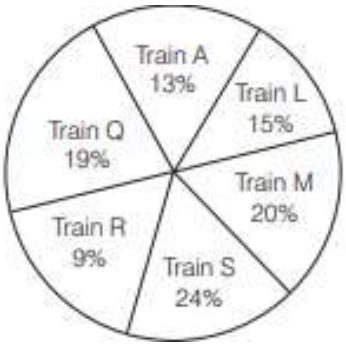
22. If the total number of Hindus in 2008 was 12 lakhs, the number of Muslims in 2008 was (in lakh)

(a) 18 (b) 12 (c) 24 (d) 16

Directions (Q. Nos. 23-27) Study the following pie chart carefully to answer the questions.

Percentage of Passenger Travelling

in Six Different Trains



Total Number of Passengers = 8500

23. What was the approximate average number of passengers in train S, train M and train L together?

(a) 1521 (b) 1641 (c) 1651 (d) 1671

24. If in train R, 34% of the passengers are females and 26% are children, what is the number of males in that train?

(a) 306 (b) 316 (c) 308 (d) 318

25. The number of passengers in train Q is approximately what percentage of the total number of passengers in trains A and R?

(a) 90 (b) 70 (c) 75 (d) 86

26. Which train has the second highest number of passengers?

(a) A (b) Q (c) S (d) M

27. How many more per cent (approximately) number of passengers are there in train M as compared to the number of passengers in train L?

(a) 29 (b) 49 (c) 43 (d) 33

Directions (Q. Nos. 28-32) The pie chart provided below gives the distribution of land (in a village) under various food crops. Study the pie chart carefully and answer the questions based on it.

28. If the total area under bajra was three hundred acre, then the total area (in hundred acre) under rice and barley together is

(a) 18 (b) 12 (c) 15 (d) 20

29. The combination of three crops which contribute to more than 50% of the total area under the food crops is

(a) wheat, rice and maize

(b) wheat, rice and jowar

(c) wheat, rice and bajra

(d) rice, barley and maize

30. The ratio of the land used for rice and barley is

(a) 3 : 1 (b) 1 : 2 (c) 2 : 1 (d) 3 : 2

31. If 10% of the land reserved for rice be distributed to wheat and barley in the ratio 2 1: , then the angle corresponding to wheat in the new pie chart will be

(a) 38.4° (b) 76.8° (c) 75.6° (d) 45.5°

32. If the production of rice is 5 times that of jowar and the production of jowar is 2 times that of bajra, then the ratio between the yield per acre of rice and bajra is

(a) 5 : 2 (b) 3 : 1 (c) 4 : 1 (d) 6 :1

ANSWERS

1.	(d)	**2.**	(a)	**3.**	(a)	**4.**	(a)	**5.**	(b)	**6.**	(a)	**7.**	(c)	**8.**	(d)	**9.**	(d)	**10.**	(a)
11.	(b)	**12.**	(c)	**13.**	(b)	**14.**	(a)	**15.**	(d)	**16.**	(b)	**17.**	(c)	**18.**	(d)	**19.**	(d)	**20.**	(a)
21.	(b)	**22.**	(d)	**23.**	(d)	**24.**	(a)	**25.**	(d)	**26.**	(d)	**27.**	(d)	**28.**	(a)	**29.**	(a)	**30.**	(c)
31.	(b)	**32.**	(a)																

Hints & Solutions:

1. From the line graph, it is clear that from March-April, the sales increased the most.

2. In percentage form 108° is equivalent to $108° \times \frac{100}{360°} = 30\%$ and from the pie diagram it is clear that expenditures of A and D together make 30%.

3. It is clear from the graph that Iran had maximum transportation of good via road.

4. Required difference = (35 − 33) % of 250000 = 2% of 250000

$$= \frac{250000 \times 2}{100}$$

$$= 2500 \times 2 = 5000$$

5. Amount Spend on agriculture = $\frac{108°}{360°} \times 40000$ = Rs. 12000

Amount Spend on Industries and minerals = $\frac{72°}{360°} \times 40000$ = Rs. 8000

∴ Required percentage $= \frac{12000-8000}{40000} \times 100 = 10\%$

6. Required amount = $\frac{72°-45°}{360°} \times 40000$

$$\frac{27°}{360°} \times 40000 = \text{Rs.}3000$$

7. Required percentage decline = $\frac{60-45}{60} \times 100 = 25\%$

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

$= \frac{440}{8} = 55$

∴ Required number of years = 4

9. Percentage increase in 1997 = $\frac{60-40}{40} = 50\%$ (maximum)

10. Total production in years 1996 and 1997 = 40 + 60 = 100

and total production in years 1995, 1998 and 2000

= 25 + 45 + 50 = 120

∴ Required ratio = $\frac{100}{120} = \frac{5}{6}$

11. Per cent increase = $\frac{90-40}{40} \times 100 = 125\%$

12. Average production = $\frac{40+30+70+25+55+50+80+90}{8} = \frac{440}{5} = 55$

i.e. (70, 80, 90) > 50

13. Average production of 2004 and 2005 = $\frac{25+55}{2} = 40$

As, average production of 2005 and 2006 = $\frac{30-50}{2} = 40$

14. Required decline = $\frac{70-25}{70} \times 100 = 64.2\%$ (approx.)

15. Number of students coming from the locality = 6 + 15 + 11 + 18 + 16 + 6 = 66 units

= 66 × 10 = 660

16. Number of students use bicycle and rickshaw = 18 × 10 + 16 × 10

= 180 + 160 = 340

17. Required percentage == $\frac{15}{66}$ × 100 = 22 = $\frac{8}{11}$ %

18. Required ratio = 6 : 16 = 3 : 8

19. Total number of Hindus in 2007 = 8000000 × $\frac{25}{100}$ = 2000000

20. Required decrease percentage = $\frac{30-15}{30}$ × 100 = 50%

21. Required difference = (30 – 15) % = 15%

22. According to the question,

15% = 1200000

∴ 20% = $\frac{1200000}{15}$ × 20 = 1600000

23. Required average number of passenger = $\frac{1}{3}$ [(24 + 20 + 15) % of 8500]

= $\frac{1}{3} \times \frac{8500 \times 59}{100} = 1671$

24. Number of passengers in train R = $\frac{8500 \times 9}{100} = 765$

∴ Number of males = (100 − 34 − 26) % of 765

= $\frac{765 \times 40}{100} = 306$

25. Required per cent = $\frac{19}{(13+9)} \times 100 = 86$

26. M, it is clear from the pie chart.

27. Required per cent = $\left[\frac{20-15}{20} \times 100\right]$ = 33%

28. Corresponding angle for rice and barley = 72° + 36° = 108°

∴ 18° = 300 acre

$1° = \frac{300}{18}$

$\therefore 108° = \frac{300}{18} \times 108$

= 1800 acre

29. 100% = 360 °

∴ 50 % = 180 °

Now, wheat + rice + maize

= 72° + 72° + 45°

= 189° > 180°

30. Required ratio = 72° : 36 ° = 2 : 1

31. 10% of 72 = 7.2 °

∴ Increase in the corresponding angle of wheat

$= \frac{2}{3} \times 7.2 = 4.8°$

New corresponding angle for wheat = 72° : 4.8° = 76.8°

32. If the production of bajra be x tonne, then

Production of jowar = 2x tonne

Production of rice = 10x tonne

∴ Required ratio $\frac{10x}{72} : \frac{x}{18} = 5$