

Data Interpretation - Introduction

Is DI very different from QA, and if so, how do they differ?

DI essentially differs from the Quantitative Ability (QA) questions because of the volume of data (and consequently the complexities of calculations) involved. To put this simply, the data associated with any QA question is usually of an easily manageable size and is specific to that particular question only. However, in DI, the data is rather voluminous and there are typically five to six questions associated with it. As we shall see later, these questions could be independent of each other, or might require the use of the data (or the outcome) given (or obtained) in one question to solve another.

Before we go on to the suggested tactics for approaching DI, let us take a quick look at the commonly encountered data types:

Most of the data in the DI section usually appears in the form of the following conventional graphs:

1.Tabular Data – This is the safest type of data, as all the numerical values are given directly and any errors that could crop up because of discrepancies in interpretation of the graphical data are eliminated. Here, it should be borne in mind that students are not allowed to use scales or rulers in the examination, and hence it is likely that after visually interpreting graphical values, a student might arrive at a value different from what the examiner had in mind.

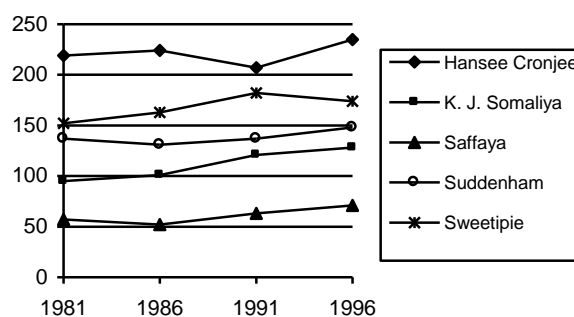
For example:

Directions for Questions 161 to 166: These questions are based on the following table, which gives the number of students passing out from some of the colleges in an Indian city.

Sr. No.	Name of College	1981	1986	1991	1996
1.	Hansee Cronjee College	219	224	207	235
2.	K. J. Somaliya College	95	101	124	128
3.	Saffaya College	57	52	63	71
4.	Suddenham College	152	159	137	148
5.	Sweetipie College	145	159	182	174

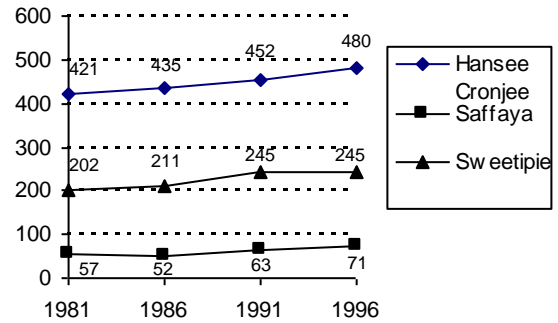
Here it can be seen that any numerical value can be obtained precisely from the above table. All students, and the examiners as well, will have to adhere to the same values while calculating.

2.Line Graphs – This is one of the simplest type of data, as all students are supposed to have dealt with line graphs during the school days. There could be one or more lines depicting different sets of data [e.g. the x-axis (usually the category axis) could denote the years, while along the y-axis (usually the value axis) one line could be used for the population of India, another for the population of Sri Lanka and so on]. If the data given in the table above is converted into a Line Graph, it would look like the line-graph shown above.



It will be evident from the graph that interpreting values accurately upto all the significant digits is rather difficult in such graphs, where the data values corresponding to a particular ordinate are not explicitly given.

3. Band Diagram – This is a special case of the line graph. Its appearance is exactly similar to that of a Line graph, but values from a Band Diagram have to be interpreted in a different fashion. In a Band Diagram, the ordinate (i.e. the value along the y-axis) at any point is taken as the difference between that point and the immediately preceding ordinate. Thus the Band Diagram is a sort of cumulative Line Graph, but every Line Graph that looks like a cumulative Line Graph should not be treated as a Band Diagram unless the data specifically gives instructions to that effect. Thus, from the table given above in type-1, if we plot a Band Diagram only for college numbers 1, 3 and 5, we will get a diagram as shown here.

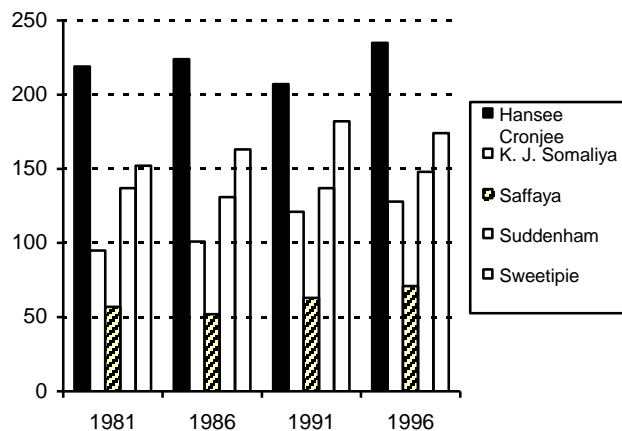


The given figure being a Band Diagram, the number of students who passed out from Hansee Cronjee in 1981 is given by [421 (i.e. its own ordinate) – 202 (i.e. the value of the immediately preceding ordinate)] = 219.

Similarly, the number of students passing out from Saffaya in 1996 is $(71 - 0) = 71$. Note that here, the y-axis did start with a value of zero, which need not be the case always. For the lowest line on the graph, the difference should be taken with respect to the starting value on the x-axis.

4. Bar Graphs – This is also a simple type of graph in which the values are represented in the form of stacks or bars. These bars or stacks could correspond to just one ordinate, or they could further be cumulative bar graphs, where one ordinate is stacked on top of the other. This becomes similar to a Band Diagram, except that here we have stacks instead of lines.

Note that in the legend to the bar graph, all the categories do not have a separate colour or pattern of shading, yet the students are expected to make use of the sequence in which the categories are mentioned in the legend and in the actual Bar Graph, in order to interpret the data correctly. This assumption holds good for any type of data.

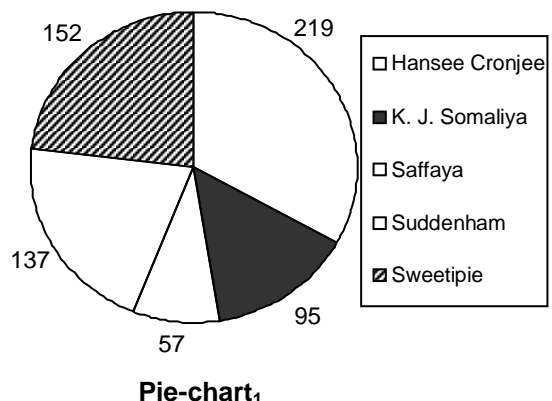


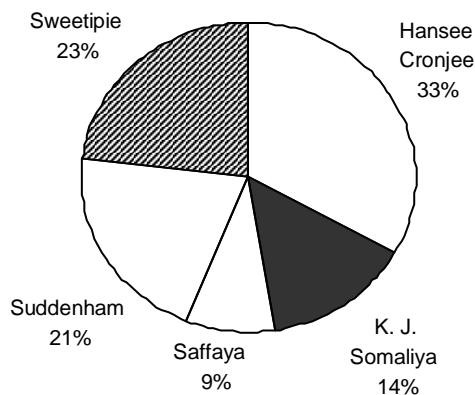
5. Pie-Charts – As the name suggests, they are graphs given in the shape of a “pie” [i.e. they are circular in shape]. It is difficult to combine more than one category in a single Pie-chart, so if the above tabular data were to be converted into a Pie-chart, we would get four different Pie-charts – one for each of the four years 1981, 1986, 1991, 1996.

Within a Pie-chart, the apportionment of the various “slices” of the “pie” is usually represented in one of the two forms, which are:

- Actual numerical values
- Percentage values.

As an example, for the above data, let us draw the Pie-chart only for the year 1981, in the two forms mentioned above. In the Pie-chart₁, (on page no. 4) the actual number of students who passed out from the given five colleges can easily be found out. In the Pie-chart₂, (on page no. 5) the values have been given in terms of the percentage only. Here again, there could be many variations.





Total students appearing in 1981 are 7500

Pie-chart₂

There is a category of questions which is specific to the Pie-charts only – the Central Angle related questions. Whether the data is given in actual numbers or in terms of percentage, the total Pie-chart subtends an angle of 360° about its centre. These 360° cater to 100% of the quantity mentioned. Thus, we can find a readymade conversion between percentages and degrees as:

$$100\% = 360^\circ, \text{ therefore } 1\% = 3.6^\circ.$$

Note : Choose Clockwise direction for all Pie Chart data in this Book.

Caselets – These contain questions based on data usually given in the form of a paragraph. This data could be quite cryptic in nature; however, obtaining the value of the unknown or decoding the given data is the most important part of solving a caselet. Once the value of this variable is obtained, all the other questions are easy to solve, as they usually hinge on the value of that particular variable. For example, a typical caselet could be like...

Mr. Dhanwaan won a lottery which awarded him a heavy sum of money. He invested one-third of the amount he had received in gold and put the remaining into shares. The shares appreciated by 15% while the investment in gold lost its value by 10%. Mr. Dhanwaan then collected all this money and put half of it in a bank at 18% per annum, while the remaining half was loaned to a friend... etc.

[The data goes on in this fashion...]

Finally, at the end of a year, he had gained a sum one and a half times the one he started off with.

We can now have a series of questions based on this data. The most likely question is to find out the sum of the lottery he had won. Once this is found, other questions like “Find the amount he invested in shares” or “How much did he lose because of the investment in gold?” etc. can be answered very easily, as they all hinge around the value of the variable “total sum of the lottery” only.

There are a couple of subtle points about caselets that should be kept in mind. Caselets can be very rewarding once we crack their code, but in case we get stuck, or get an answer which is incorrect, we will have lost time and effort – that too, possibly, just for getting the further questions wrong! This is something one has to be very careful of.

Also, it might be a good idea to avoid solving caselets towards the very end of the paper. This is because though we might crack the caselet correctly in time, we might be left just one or two minutes short of the section-time, thus being forced to leave the other simple questions of the caselet unattempted.

Expected Knowledge of Technical Terms

The data given in DI may involve many technical terms in economics, finance etc. As the students taking the examination come from diverse streams, the examiners certainly do not expect all the students to have a very sound knowledge of such terms. In order to make the data comprehensible to all, the explanation / elaboration / definition of certain terms is provided with the data. However, very commonly used terms and relations like “Income = Expenditure + Savings” or “Surplus (or Deficit) = difference between the Income and Expenditure” are indeed taken for granted.



Data dealing with “Current Prices, Constant Prices, Indices etc.” is commonly encountered in DI and in the following section, we shall try to get an idea about it. In order to stress the importance of the concept and not of the calculations, simple figures have been given.

Directions: The following table gives the data about the Consumer Index in core sectors in the city of Pune, at 1975 prices. The index in all sectors in 1975 was 100. The last column gives the value of the goods/services (in Rs. crore) from the three sectors in the year 1980.

	1980	1985	1990	Value in 1980
Agriculture	110	125	120	165
Industry	120	130	150	180
Services	100	110	125	150

An Index is a convenient way of representing changes or deviations in a quantity. Since it shows the change in pattern, this change has to be with respect to some benchmark or standard reference. This reference is usually mentioned in terms of a certain point in time (the year 1975, in this case) and a certain Base Value, usually 100 (as in this case too), since it becomes easy to calculate the percentage changes with respect to 100. That is, if the index changes from 100 to 94, it reflects a percentage change of $(-6)\%$.

Consider the various types of Indices on the stock markets. An index of 2500 in 1998 could imply that starting with a Base Value of 100 in a particular year, say, 1970, the index has reached 2500 in 1998. This implies that an investment worth Rs. 100 in the year 1970 has now become worth Rs. 2500.

There exists a direct variation between an Index value and the actual quantity it stands for. For example, the index for Agriculture in 1980 is 110 and this corresponds to a value of Rs. 165 crore, as shown in the last column. Since the Base Value of the index in 1975 is 100, the change in the index has been $+10\%$, from 100 in 1975 to 110 in 1980. Thus the value in Rs. crore in 1980 (= 165 crore) is after a 10% increase over that in 1975. So in the year 1975, the value must have been $[(100/110) \times 165] = \text{Rs. } 150 \text{ crore}$.

When data over a number of years is given in monetary terms (with or without reference to an index), the values could be at “Constant” or at “Current” prices. The constant prices express the various values in terms of the worth of the currency of the reference year only, while the Current Prices express values in terms of the worth of the currency of that particular year, i.e. the current year itself. In the above table, the values in the rightmost column are in terms of Constant Prices, i.e. at 1980 prices. Note that the values of 1985 and 1990 have been entered into the table after converting them to 1980 prices. Thus, we might be asked,

“Assuming that from 1980 to 1990, the rupee has depreciated from 100 paise to 80 paise, what was the value of the Services in 1990 at Current Prices?”

Let the value of the Services in 1990 be Rs. X crore. This X represents the value at Current Prices, i.e. 1990 prices.

We can see that the Index values of 1980 are connected to the actual values (rightmost column) by a factor of 1.5, i.e. $(\text{Index for } 1980) \times 1.5 = (\text{Actual value for } 1980)$. Further, at Constant Prices, for the “Services” category, the Index value of 1980 (100) is connected to that in 1990 (125) by a constant = 1.25. Thus, the actual value of Services in 1990 will be $[(100) \times 1.5 \times 1.25] = 187.5$. This value is at Constant, i.e. 1980 prices.

Now we know that in 1990, the value of the rupee has become $[80/100]$ i.e. $[4/5]$ times its value in 1980. When X (at Current Prices) was multiplied by $[4/5]$, we got a value which was at Constant Prices, and which we have found out to be as 187.5. Thus, $[4/5]X = 187.5$, so $X = 187.5 \times 5/4 \approx 235$. Thus the value of Services in 1990 at Current Prices is about 235.

Importance of percentage calculations

Many of the questions in DI involve percentage calculations, especially calculation of percentage change. To understand the subtleties in this, let us consider the following example:

The production of wheat in Gehugaon was 90 tonnes in 1980, and that it increased to 120 tonnes in 1990.

Regarding this percentage change in production, we could be asked questions in two ways:

By what percent was the wheat production of 1990 more than that of 1980?

By what percent was the wheat production of 1980 less than that of 1990?

The general formula for percentage change calculations is $(\text{Change in value} / \text{original value}) \times 100$

In both the above questions, the “change in value”, i.e. difference in wheat production over the decade is the same. But in spite of this, the answers in the two cases are different, because the denominator in the two cases is different.

In the first case, the emphasis is on “... *than that of 1980?*”. This means that the change in production is being compared to the production of 1980 as the reference or original value. The answer here would thus be $\{(120-90) \times 100\} / 90 = 33.33\%$.

In the second case, the emphasis is on “... *than that of 1990?*”. Thus, here the same change in production is being compared to the production of 1990 as the reference or the original value. The answer in this case would thus be $\{(120-90) \times 100\} / 120 = 25\%$.

It will be clear that it is important to have the correct approach towards solving percentage change problems. Words like “as compared to, with respect to, less than, greater than etc.” are valuable hints for selecting the correct “Original value”. However, in some cases, we might just be asked, “What was the percentage change in the wheat production?”. In such cases, the general formula to be adopted is $[(\text{Final Value} - \text{Initial Value}) / \text{initial value}] \times 100$

Approximations

As mentioned earlier, the amount of calculations required to be done in DI are considerably more than those usually required in Quantitative Ability. However, the ultimate aim is to arrive at the correct answer, and techniques like approximations, elimination of choices (explained later on) are very important tools for tackling long calculations.

Let us say that we have to find the value of $(724/592.7)$. Here, 592.7 can easily be approximated to 600, while 724 can be approximated to 720. We have taken 720 and not 730 because both, 600 and 720 are both multiples of 120. The value would get after approximations would be $(720/600) = (6/5) = 1.2$. It is quite easy to arrive at this answer. But this might not be all. We could hereafter be confronted with answer choices like 1.18 and 1.22, both of which are equidistant from the answer we have arrived at.

Keeping track of the approximations helps a lot in such cases. We know that we have decreased the numerator from 724 to 720. So whatever be the value we get, it will be less than the actual value of the fraction. Further, we have also increased the denominator from 592.7 to 600. This change will further reduce the value we get as compared to the actual value. At the end of our approximations, if we are getting a value of 1.20, then the actual value *must be greater than* the one we have got. Thus 1.22 is the correct answer, and 1.18 can logically be eliminated.

This was still a relatively easy problem where both the approximations led to a decrease in the obtained value. But there could certainly be cases where both, the numerator (N) and the denominator (D) will either be increased or decreased, making it difficult to find the actual value. In such cases, we should try to make judgements by finding the percent to which we are approximating N and D. For example, consider the fraction $59/39$. This can be approximated to $60/40$, i.e. 1.5. We now wish to know whether the exact value is greater than or less than 1.5.

In this case, both N & D have been augmented by one. But the relative increase in N is just $(1/59)$ which is less than the relative increase in D, which is $(1/39)$. Thus the percentage increase in D is greater than that in N, and the value that we get after approximating will be *less than* that of the actual value. Just to confirm this, check the value on a calculator; $(59/39) = 1.512$ which is > 1.5 , the value we have got.

Adequate practice in such calculations, well supplemented by the students’ own desire to “get a feel of numbers” could well be the key to dramatic time-saving in calculations. In addition to this, the two rules given below could frequently be of help:



Let a , b and c be positive real numbers.

1. If $\left(\frac{a}{b}\right) < 1$ then $\left[\frac{(a+c)}{(b+c)}\right] > \left(\frac{a}{b}\right)$

This means that the addition of the same positive constant to N and D of a fraction, which is less than one, gives a fraction greater in value than the original fraction.

2. If $\left(\frac{a}{b}\right) > 1$ then $\left[\frac{(a+c)}{(b+c)}\right] < \left(\frac{a}{b}\right)$

This means that addition of the same positive constant to N and D of a fraction, which is greater than one, gives a fraction lesser in value than the original fraction.

In the example considered above, we can apply this rule by taking $a = 59$, $b = 39$ and $c = 1$.

Other practical tips

While solving DI problems, it is often helpful to glance at the answer choices and observe the closeness / variation in values.

For example, if we are finding out the value of $(881/253)$ and the answer choices are 2.5, 3.5, 4.5 and 5.5, then we know that the answer has to be greater than 3 (251×3 is close to 750) and less than 4 (251×4 is close to 1000). There is only one choice "3.5" which satisfies this condition, without indulging in actual calculations, we can mark it as the answer, having *logically eliminated other choices*.

Students must be careful of choices like "None of these". If the actual answer is 3.1, which is far from 2.5 as well as 3.5 and "None of these" is given as one of the choices, then that itself is the best choice. Also, after reading a problem, try to determine what exactly is the data that is required for the problem, and whether the directions and information given make all that data available or not. If the data is not sufficient, it would be a waste of precious time to indulge in calculations which have no bearing later on. The answer here could be of the form "Indeterminable" or "Insufficient data".

In order to minimise the time required for obligatory calculations, it is essential to be well-versed with tables up to 20, while familiarity with tables up to 30 is desirable. Apart from this, one must be able to multiply, say, 47 with 17 as $(40+7)(17) = 680+119 = 799$.

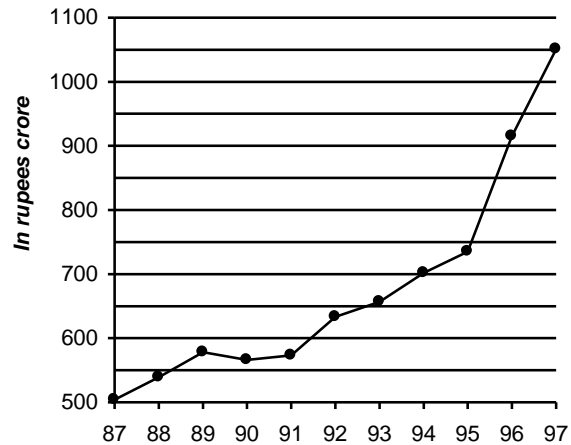
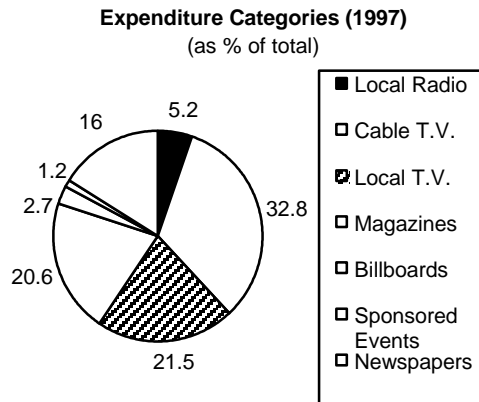
The data given (or the conditions mentioned) in one of the earlier questions should not be made use of while solving the subsequent questions, unless the instructions allow us to do so. For example, if question 1 is of the type "If the population of Asangaon is 1 lakh, what is the..." and question 2 requires the population of Asangaon, then we cannot directly use the value of 1 lakh, unless question 2 mentions something like "Referring to the earlier question, what was...", or the directions mention "Data obtained in one question may be used in subsequent questions".

Students are advised to keep the above points in mind and try to implement them. These may not be the best techniques – a student could certainly come out with techniques more efficient than these – but they can serve as good guidelines to initiate the thinking process in the right direction. The students are encouraged to interact with the faculty for any doubts and difficulties that they may have.

Exercise - 1(A)

Directions : Questions 1 to 8 are to be answered on the basis of the information available in the following graphs.

National Advertising Expenditure



- In 1997, the expenditure on which of the following advertising categories was approximately equal to a quarter of that on magazines?
a. Local radio b. Newspapers c. Network radio d. Local T.V.
- For the years in which national advertising expenditures were less than that in 1989, what was the average of these in rupees crore?
a. 521.5 b. 536.3 c. 545.5 d. 552.0
- For how many of the seven advertising categories was the amount spent in that category in 1997 more than one-third of the total national advertising expenditure in 1992?
a. 1 b. 2 c. 3 d. 4
- In how many years from 1988 to 1997 did national advertising expenditures increase by more than 10% from the previous year?
a. 1 b. 2 c. 3 d. 4
- What was the amount spent on local radio advertising in 1997 (in Rs. million)?
a. 610 b. 575 c. 769 d. None of these.
- By what percentage has the national advertising expenditure increase from 1990 to 1997?
a. 65% b. 74% c. 88% d. 108%
- By what percentage has the national advertising expenditure on network radio increased from 1987 to 1997?
a. 65% b. 74% c. 85% d. Indeterminable
- If in 1997, 37.5% of the advertisements in magazines were in film magazines and Filumfair was the largest selling film magazine with a 33.3% share of the market, what was the revenue (in Rs. crore) that Filumfair managed to generate because of advertisements?
a. 26.3 b. 28.9 c. 31.4 d. None of these.



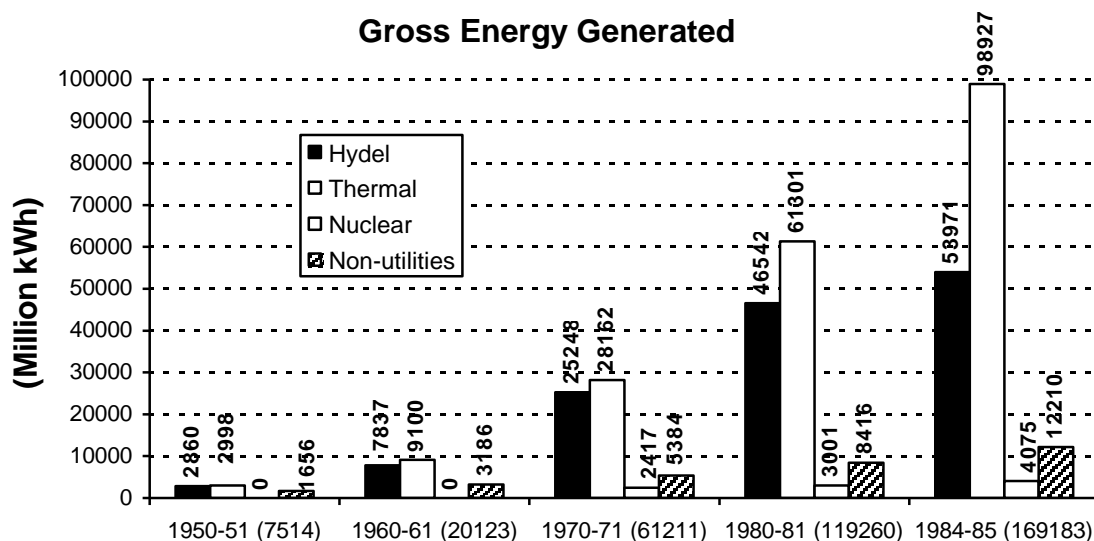
Directions : Questions 9 to 12 are to be answered on the basis of the following information.

Narayan works X hours a day and rests Y hours a day. This pattern continues for a week, with an exactly opposite pattern the following week, and so on for four weeks. Every fifth week, he has a different pattern. When he works longer than he rests, his wage per hour is twice what he earns per hour when he rests longer than he works. The following table gives Narayan's daily working hours for weeks 1 – 13. A week consists of six days and a month consists of four weeks.

	1 st week	5 th week	9 th week	13 th week
Rest	2	3	4	---
Work	5	7	6	8

9. Narayan is paid Rs. 20 per working hour in the first week. What is his salary for the first month?
a. 1440 b. 2040 c. 1320 d. 1680
10. Referring to the previous question, what will be Narayan's average salary at the end of the first four months?
a. 1760 b. 2040 c. 1830 d. 1680
11. The new manager, Kushaldas, stipulated that Rs. 5 be deducted for every hour of rest and Rs. 25 be paid per hour starting from the ninth week. What will be the change in Narayan's salary for the third month? (Hourly deductions and salaries are constant for all weeks starting from the ninth week).
a. 540 b. 120 c. 240 d. 0
12. Using the data in the previous questions, what will be the total earning of Narayan at the end of sixteen weeks?
a. 7320 b. 7200 c. 8400 d. 7680

Directions: For questions 13 to 20, refer to the following bar graph and the table following it.



The figures in brackets show the Total Energy production in the respective years. Assume that all the generated power was consumed.

Per Capita Consumption of Energy (kWh)				
1950-51	1960-61	1970-71	1980-81	1984-85
17.9	38.2	89.8	132.3	156.0

13. Thermal power constituted what percent of the total power generated in 1984-85?
a. 50% b. 53% c. 56% d. 59%
14. By what percent has hydel power grown from 1970-71 to 1984-85?
a. 106% b. 114% c. 123% d. None of these.
15. The per capita consumption of power in 1960-61 was less than that in 1980-81 by how much percent (approx.)?
a. 71% b. 64% c. 79% d. 85%
16. What is the approximate ratio of the hydel power generated in 1950-51 to that of the non-utilities a decade later?
a. 7:9 b. 5:7 c. 3:4 d. 9:10
17. The non-utilities in 1984-85 formed what percent of the sum of the other three sources in 1980-81?
a. 11.0% b. 13.1% c. 15.7% d. None of these.
18. At what simple rate has nuclear energy grown annually during the given period from the inception of nuclear production?
a. 4.8% b. 5.9% c. 7.3% d. None of these.
19. In the per capita consumption of power in 1970-71, approximately how many units were contributed by thermal power?
a. 31 b. 36 c. 41 d. 45
20. Approximately in what proportion has the per capita consumption of power recorded an increase over the given period?
a. 1 : 8.7 b. 1 : 6.3 c. 1 : 5.8 d. None of these.



Exercise - 1(B)

Directions : Questions 1 to 6 are to be answered on the basis of information given below.

A company produces five types of jewellery – necklaces, pendants, rings, bracelets and earrings – using three qualities of gold – 22 carat, 20 carat and 18 carat and using three types of precious stones – diamonds, rubies and emeralds. The following tables give, respectively :

- The number of necklaces, pendants, rings, bracelets and earrings produced, in thousands.
- The percentage distribution of the quality of gold in each type of jewellery, and
- The percentage distribution of types of precious stones in each type of jewellery.

Note: Each type of jewellery requires 200 gram of gold and 420 precious stones.

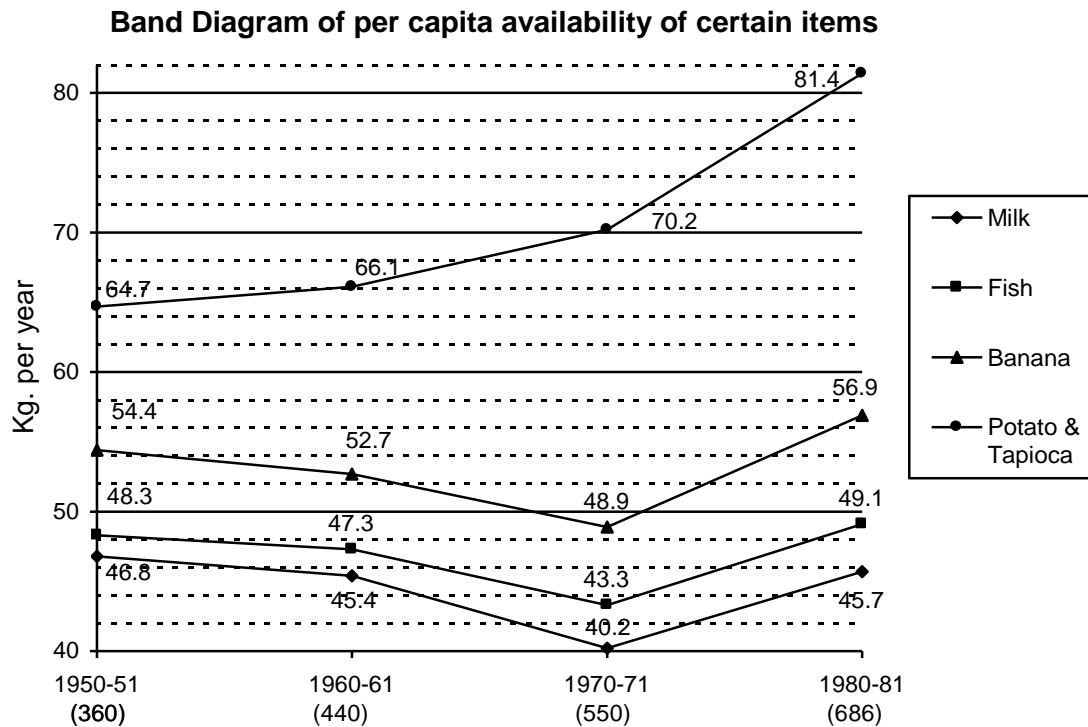
Jewellery Type	Number (000)	Jewellery Type	Distribution of gold(%)			Jewellery Type	Distribution of precious stones (%)		
			22 carat	20 carat	18 carat		Diamonds	Rubies	Emeralds
Necklaces	20	Necklaces	80	20	---	Necklaces	70	15	15
Pendants	30	Pendants	30	40	30	Pendants	20	50	30
Rings	30	Rings	---	70	30	Rings	---	60	40
Bracelets	10	Bracelets	---	60	40	Bracelets	---	40	60
Earrings	10	Earrings	---	10	90	Earrings	---	20	80

- Which of the following is a correct representation of the amount of gold used?

Distribution of Gold (kg)			
	22 carat	20 carat	18 carat
a.	11000	40000	6200
b.	11000	8800	6200
c.	5000	8800	6200
d.	5000	40000	38000

- How many grams of 22 carat gold is consumed by Necklaces?
a. 4000 kg b. 3200 kg c. 5000 kg d. None of these.
- What is the ratio of Emeralds used for Rings to that for Bracelets?
a. 0.66 b. 1.5 c. 0.83 d. None of these.
- How many kg of 18 carat gold is consumed?
a. 8800 b. 5000 c. 4800 d. 6200
- What is the ratio of the total number of Diamonds, Rubies and Emeralds used in jewellery which contains 22 carat gold?
a. 10 : 9 : 6 b. 18 : 13 : 9 c. 13 : 9 : 18 d. Can't be determined
- If all the bracelets and earrings made are moulded, then how many pendants can be formed?
a. 20 b. 18 c. 12 d. Indeterminable

Directions : Questions 7 to 14 are to be answered with the help of the following band-graph.

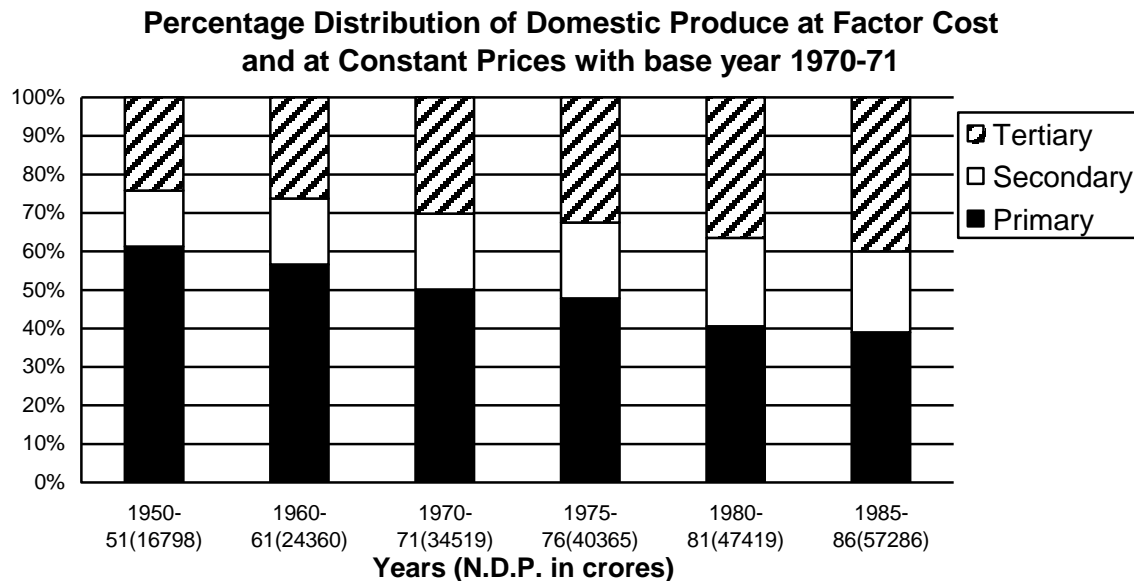


The figures in brackets show the total population in millions.

7. What was the total production of milk (in billion kg) in the year 1960-61?
a. 17.2 b. 18.6 c. 19.1 d. 20.0
8. What is the increase in the production of fish (in million kg) from 1960-61 to 1970-71?
a. 630 b. 820 c. 530 d. 870
9. What is the percentage increase in the production of potato and tapioca from 1950-51 to 1980-81?
a. 250% b. 300% c. 320% d. 350%
10. If the year 1974-75 experienced a 20% drop in the total production of banana compared to 1970-71, what was the actual total production of banana (in million kg) for 1974-75?
a. 3696 b. 2210 c. 3080 d. 2464
11. If the year 1971-72 witnessed a doubling in the amount of fish produced compared to the fish production of 1960-61, what was the per capita availability of fish in 1971-72?
a. 14.6 kg b. 3.8 kg c. 12 kg d. Indeterminable
12. If the year 1990-91 had an 80% increase in the per capita availability of potato and tapioca as compared to the per capita availability in 1980-81, what was the simple annual increase in production (in million kg per year), if the population then was 820 million?
a. 1650 b. 1725 c. 1850 d. 1925
13. If each category registered a 20% increase in per capita availability from 1980-81 to 1990-91, then what was the total availability (in billion kg) in 1990-91, given that the population was the same as that mentioned in the previous question?
a. 68.6 b. 72.2 c. 77.8 d. 80.3
14. If milk has 1800 calories per kg, what approximately is the average kilocalorie intake due to milk consumption per person per month?
a. 5.54 b. 6.03 c. 7.16 d. Insufficient data



Directions : Answer questions 15 to 22 with the help of the following bar graph.



15. What was the contribution (in rupees billion) of the primary sector to the NDP in 1980-81?
a. 210.2 b. 173.6 c. 189.7 d. 200.5
16. By what % has the NDP increased between 1960-61 and 1985-86?
a. 132% b. 143% c. 160% d. 178%
17. In which year did the contribution of the tertiary sector register the maximum percentage increase with respect to previous data given?
a. 1970-71 b. 1980-81 c. 1985-86 d. 1960-61
18. By approximately how much (in rupees crore) has the contribution of the secondary sector to the NDP increased from 1970-71 to 1980-81?
a. 4000 b. 4300 c. 4550 d. 4800
19. What was the total contribution (in rupees crore) of the primary and tertiary sectors to the NDP in 1975-76?
a. 27800 b. 39600 c. 35100 d. 32300
20. If the value of the rupee in 1985-86 was 30 paise as compared to its 1970-71 value, what was the contribution (in rupees crore) of the tertiary sector in 1985-86 at constant prices?
a. 6784 b. 13748 c. 22915 d. None of these.
21. What was the contribution (in rupees crore) of the Primary Sector to the NDP in 1985-86 at current prices? (Refer to data in the previous question).
a. 68521 b. 74472 c. 78692 d. 85184
22. What was the contribution (in rupees crore) of the Secondary Sector to the NDP in the last 2 periods mentioned in the table, at 1970-71 prices?
a. 25000 b. 18800 c. 29200 d. 22900

Directions : Questions **23** to **30** are to be answered on the basis of information available in the following table.

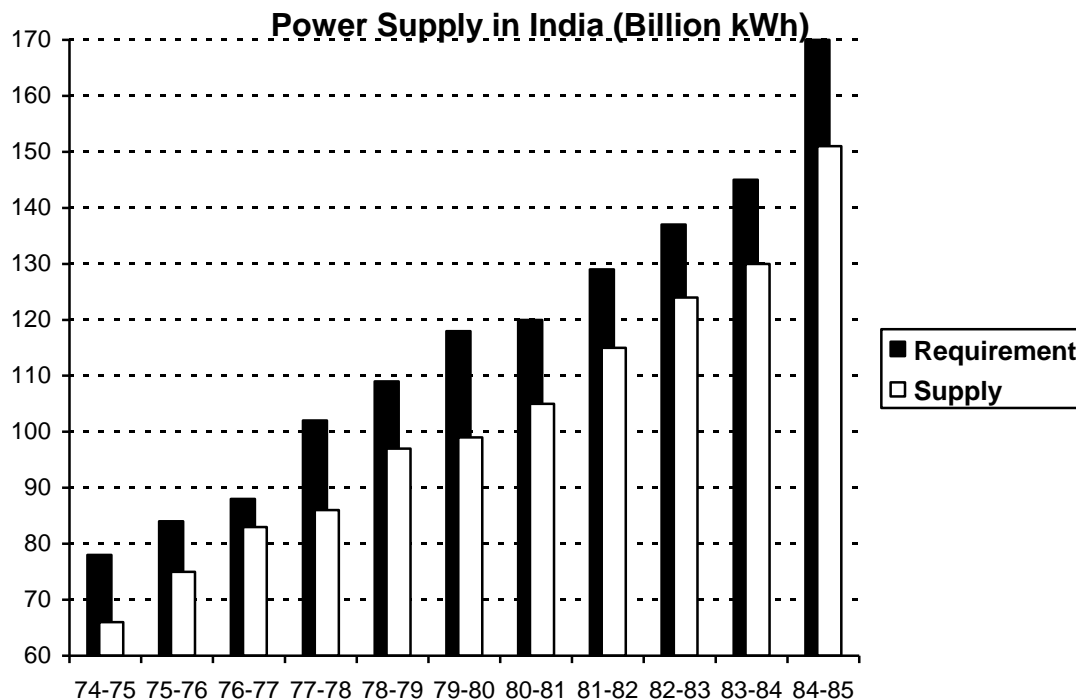
SEVENTH PLAN : EXPORT PROJECTIONS (Rs crore at 1984-85 prices)

Product	1984-85	1989-90	Seventh Plan Total 1985-90
Engineering Goods	870	1862	7011
Gems	1367	1163	7700
Handicrafts	415	494	2307
Tea	718	770	3724
Coffee	221	232	1136
Processed food	328	424	1918
Spices	217	270	1243
Marine products	338	446	2113
Jute products	207	222	1078
Iron ore	438	608	2676
Leather	533	577	2796
Cotton textiles	380	440	2077
Garments	875	1336	5683
Others	3005	4487	19191
Total	9962	13831	60653

23. The projected export in 1989-90 exceeds the average annual export during the Seventh Plan period by how many crores?
a. 950 b. 1220 c. 1350 d. 1700
24. What is the average of the ratios of exports of cotton textiles and garments to the total exports in 1984-85 and 1989-90?
a. 0.110 b. 0.126 c. 0.141 d. 0.164
25. Consider that the values given in the table are at current prices. What percent change in the value of the rupee from 1984-85 to 1989-90 would make the 1989-90 export projections equal in value to those of 1984-85?
a. 23.2% increase b. 28.5% decrease c. 33.6% increase d. Insufficient data.
26. Had the rupee appreciated by 30% from 1984-85 to 1989-90, what would have been the actual increase in the exports (in Rs. crore) for these two years at current prices?
a. 680 b. 1150 c. 820 d. Indeterminable
27. The export of gems in 1984-85 was less than the projected annual average export of gems during the Seventh Plan Period by (in Rs crore)...
a. 168 b. 173 c. 180 d. None of these.
28. What was the overall percentage increase in the exports of all categories except "Others", from 1984-85 to 1989-90?
a. 32% b. 27% c. 35% d. None of these.
29. What was the difference between the exports of Leather and Jute products of 1984-85 and the average annual value of the same during the Seventh Plan Period? (in Rs. Crores)
a. 35 b. 47 c. 68 d. 90
30. The exports of tea, coffee and processed food formed what percent of the total exports for the years 1984-85 and 1989-90?
a. 8.2% b. 14.4% c. 19.6% d. None of these.

Exercise - 2(A)

Directions: Questions 1 to 7 are to be answered on the basis of information available in the following bar graph.

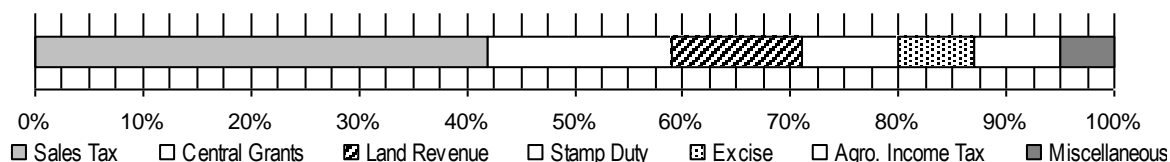


- What was the percentage increase in the supply of power from the start to the end of the given period?
a. 144% b. 112% c. 128% d. None of these.
- The cumulative difference between the requirement and supply of power (in billion kWh) within a decade of 1974-75 was...
a. 119 b. 129 c. 149 d. 139
- What is the ratio of the availability of supply in 1976-77 to the requirement in 1983-84?
a. 0.57 b. 0.63 c. 0.51 d. None of these.
- The difference between the percentage increase of supply from 1976-77 to 1980-81 and the percentage increase in requirement from 1980-81 to 1984-85 is...
a. 12 b. 19 c. 16 d. None of these.
- How many years have registered a minimum of 10% increase in the requirement of power compared to the previous year?
a. 1 b. 2 c. 3 d. None of these.
- If electricity was supplied at 80 paise per kilowatt-hour, what was the income (in Rs. billion) in 1982-83?
a. 116 b. 99 c. 86 d. Insufficient data.
- If the supply figures do not take into account illegal connections which form 10% of the total actual supply, what is the percentage loss in revenue for 1984-85 with respect to the acquired revenue? [The cost of electricity in 1984-85 is Rs. 1.10 per kWh].
a. 20% b. 15% c. 9.99% d. 11.11%

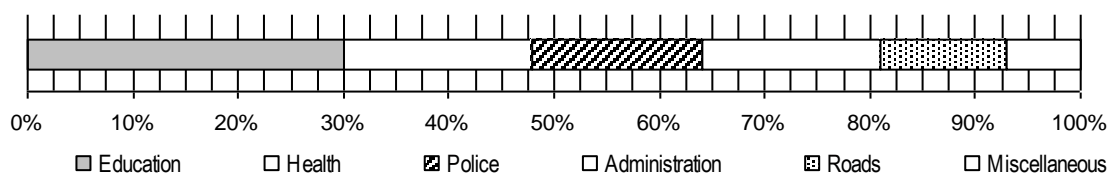
Directions : Questions 8 to 14 are based on the following graphs.

STATE GOVERNMENT BUDGET

Revenue (Rs.1350 crores)



Expenditure (Rs.1480 crores)



8. What is the status of the state budget for the year?
 - a. a deficit of Rs. 130 crore
 - b. a deficit of Rs. 80 crore
 - c. an excess of Rs. 130 crore
 - d. an excess of Rs. 80 crore
9. What was the amount contributed to the state revenue by the single largest contributor?
 - a. Rs. 529 crore
 - b. Rs. 567 crore
 - c. Rs. 594 crore
 - d. None of these
10. What is the additional revenue that can be generated if an additional surcharge of 15% is levied on Excise?
 - a. Rs 8.1 crore
 - b. Rs 14.2 crore
 - c. Rs 10.8 crore
 - d. Indeterminable.
11. The government decides to abolish Agro Income Tax but wants to compensate the loss by levying a surcharge on Land revenue. What must the rate of the surcharge be?
 - a. 25%
 - b. 40%
 - c. 50%
 - d. None of these.
12. If children between the ages of 5 and 15 years account for 30% of the Educational expenses and 25% of the Health expenditure, what approximately is the cumulative amount spent on them (i.e. on Health + Education)?
 - a. Rs 128 crore
 - b. Rs 200 crore
 - c. Rs 224 crore
 - d. None of these.
13. If the expenditure on education is reduced by 20% and the savings are distributed equally between roads and health, how many crore rupees will now be spent on roads?
 - a. 165
 - b. 190
 - c. 205
 - d. 225
14. Twenty percent of central grants was spent on the maintenance of highways, of which 10% was spent on the maintenance of the Bombay – Pune highway, which accounted for 60% of the total amount spent on the maintenance of highways. What was this total amount spent on the maintenance of highways?
 - a. Rs 9.0 crore
 - b. Rs 6.2 crore
 - c. Rs 7.7 crore
 - d. Rs 4.5 crore



Directions : Questions **15** to **20** are to be answered on the basis of information available in the following table.

World-wide Production of 4-Wheelers :

Item / Make	1950-51	1965-66	1971-72	1976-77	1979-80
Total Passenger cars	155.24	195.99	203.34	210.14	212.50
American	40.83	53.88	57.43	62.03	61.30
German	36.83	42.02	39.99	40.91	41.30
Japanese	45.15	64.59	67.72	69.69	71.65
British	1.51	1.15	0.94	0.91	0.76
Korean	0.06	0.07	0.07	0.09	0.13
French	1.25	1.07	0.99	0.98	1.00
Italian	0.64	1.03	1.11	1.07	1.15
Total Non-Passenger vehicles	74.40	115.45	138.54	141.00	146.00
Total 4-Wheelers	229.64	311.44	341.88	351.14	358.5

All figures in millions

15. The combined production of British, French, Korean and Italian cars registered what percentage change between 1950-51 and 1976-77?
a. 14% b. 18% c. 9% d. None of these.
16. The non-passenger vehicles formed what proportion of the total four wheelers in 1971-72?
a. 0.33 b. 0.37 c. 0.41 d. None of these.
17. American vehicles constituted 60% of the non-passenger vehicles in 1950-51. This share reduced by one percentage point in every two years. So by the year 1979-80, what approximately was the difference in production of American non-passenger vehicles?
a. 17.3 million b. 14.7 million c. 20.1 million d. Indeterminable.
18. The American, German and Japanese passenger cars of 1965-66 formed what percent of the total number of four-wheelers of the next decade?
a. 23% b. 19% c. 26% d. Indeterminable.
19. In 1971-72, Indian passenger cars form 15% of the other countries (i.e. countries not mentioned under Passenger Cars). What was the actual number of Indian passenger cars produced in 1971-72?
a. 4.35 million b. 5.25 million c. 6.40 million d. Insufficient data.
20. It is given that passenger cars comprise of cars and jeeps. In 1979-80, jeeps accounted for 40% of the German passenger cars. What was the number of German cars produced then?
a. 21.24 million b. 19.60 million c. 24.78 million d. Indeterminable.

Exercise - 2(B)

Directions: Questions 1 to 4 are based on the following table.

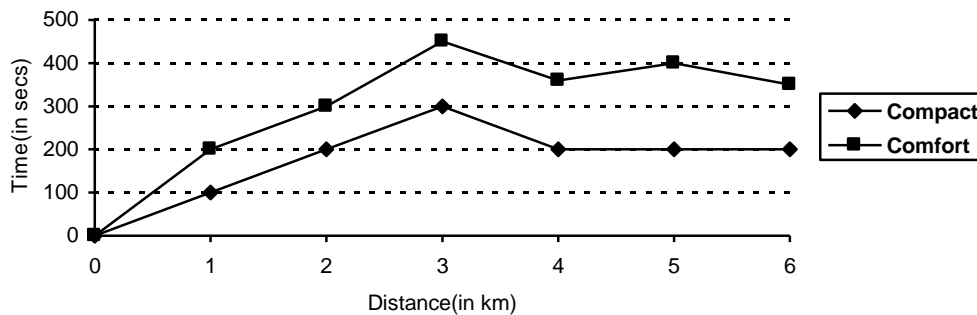
Market Shares of Some Products in Four Metropolitan Cities

Period / Products	Mumbai 1993 - 94	Calcutta 1993 - 94	Delhi 1993 - 94	Madras 1993 - 94
Soap	20 – 15	35 – 30	20 – 15	20 – 30
Deodorant	20 – 25	30 – 15	15 – 10	20 – 15
Perfume	45 – 40	25 – 35	35 – 35	10 – 10
Talc	15 – 20	10 – 20	10 – 10	50 – 45

- The percentage market share of which product did not decrease between 1993 and 1994 in any city?
a. Soap b. Deodorant c. Perfume d. None of these.
- How many products doubled their market share in one or more cities?
a. 0 b. 1 c. 2 d. 3
- What is the largest percentage drop in market shares for any product in any city?
a. 60% b. 50% c. 53.3% d. 20%
- What is the number of products which had 100% market share in the four metropolitan cities?
a. 0 b. 1 c. 2 d. 3

Directions: Questions 5 to 9 are based on the following data.

Maruti Automobiles is going to launch two new models, the Maruti Compact and the Maruti Comfort. The following band diagram gives the results of several test drives conducted on both the models at different speeds.

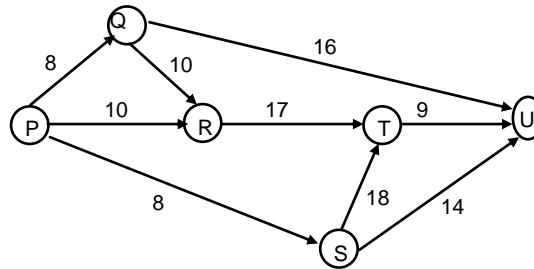


- During the 5 km test drive, the ratio of average speeds of Maruti Compact to Maruti Comfort is
a. 1 : 2 b. 2 : 1 c. 1 : 1 d. 4 : 1
- If Maruti Comfort is driven over a 6 km distance at a uniform speed which is equal to the sum of the average speeds of both the cars over the 3 km test drive, then the time taken by Maruti Comfort to cover the distance is
a. 100 seconds b. 200 seconds c. 150 seconds d. 300 seconds
- Maruti Compact, after covering 4 km during the 6 km test drive developed some engine trouble and its speed was reduced to half its original speed. What was its original speed ?
a. 72 kmph b. 108 kmph c. 144 kmph d. Indeterminable.

8. Which alternative correctly represents the following in descending order?
 [p] Average speed of Maruti Compact over 5 km test drive.
 [q] Average speed of Maruti Comfort over 6 km test drive.
 [r] Average speed of Maruti Comfort over 3 km test drive.
 a. [p], [r], [q] b. [r], [q], [p] c. [p], [q], [r] d. [q], [p], [r]
9. The average speed of Maruti Compact over the 6 km test drive is how many percent more than the average speed of Maruti Comfort over the 2 km test drive?
 a. 33.33% b. 50% c. 100% d. None of these.

Directions: Answer questions 10 to 12 with the help of the following information.

Theekthaakbhai undertakes overhauling of two-wheelers, three-wheelers and trucks at his garage. The overhauling process includes activities like scrubbing, denting, painting, repairs, assembly, etc. The network given below gives the sequence of activities to be followed and the time required (in hours) for each activity in overhauling a two-wheeler. The overhauling of a vehicle starts at the node P and the overhauled vehicle is delivered at U. All activities must be completed before a vehicle is delivered. The time required for all activities for two-wheelers, three-wheelers and trucks are in the ratio 1 : 2 : 3.



10. What is the minimum time required for overhauling a truck (in hours)?
 a. 44 b. 132 c. 110 d. 330
11. Theekthaakbhai's charges (in rupees) for each activity are 100 times the time required to complete each activity. If a customer wants his vehicle delivered earlier, Theekthaakbhai reduces the time required for each activity by an hour. At the same time, he charges the customer extra according to the following rates: Activities starting from P : 10% extra, activities starting from Q : 12% extra and activities starting from S : 15% extra. What is the extra amount that a customer will have to pay in order to obtain his three-wheeler earlier?
 a. Rs 2020 b. Rs 1610 c. Rs 1120 d. None of these.
12. If the time required for activities (P – R) and (S – T) is reduced by 3 hours each and that of activities (P – S) and (Q – U) is increased by 2 hours each, what will be Theekthaakbhai's change in revenue (in rupees) from overhauling a two-wheeler, knowing that for each activity, he still charges (in rupees) 100 times the time required for each activity?
 a. Rs 200 b. Rs 95 c. Rs 411 d. Insufficient data

Directions: Questions 13 to 15 are based on the following data.

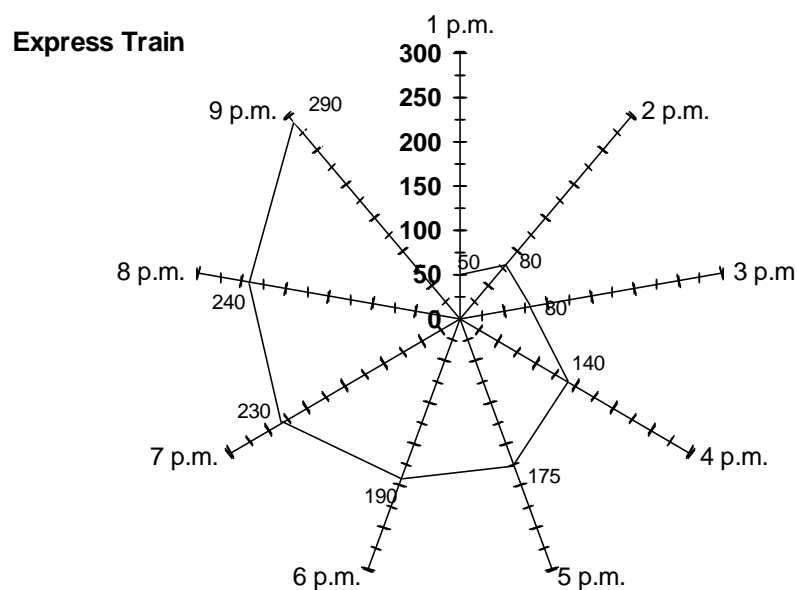
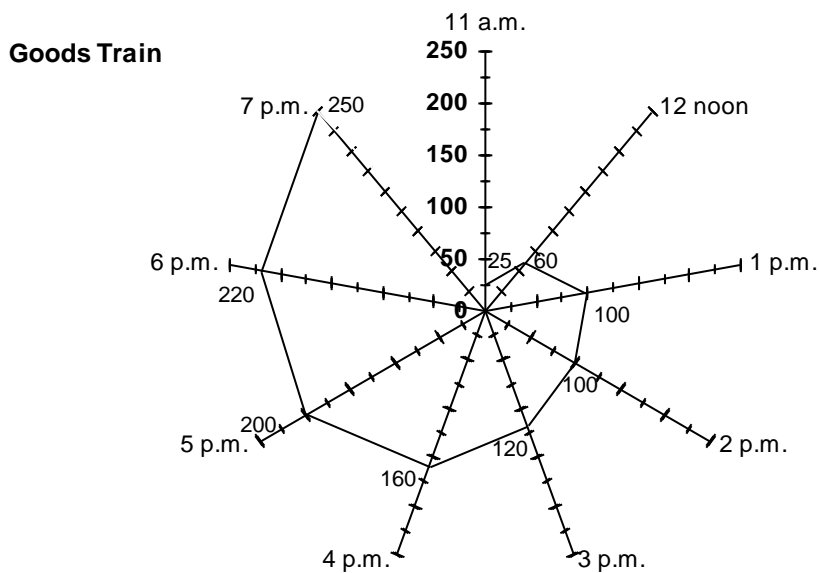
A factory uses two machines, M_1 and M_2 to manufacture three products, A, B and C. The two machines operate 9 hours a day each. The efficiency of the two machines with respect to the three products is given in the table below. The numbers indicate the time taken (in minutes) by the two machines to manufacture one unit of the three products.

	M_1	M_2
A	15	18
B	14	12
C	16	18

13. What is the maximum number of units manufactured if M_1 is used to manufacture units of A only and M_2 is used to manufacture units of B only?
a. 64 b. 81 c. 89 d. None of these.
14. On a particular day, the factory obtains an order to manufacture 35 units of B and 25 units of C. What is the maximum number of units of A that can be manufactured on that day?
a. 15 b. 18 c. 22 d. None of these.
15. A unit of B can be manufactured only after three units of A and two units of C are manufactured. What is the minimum extra time required to manufacture 12 units of B on a particular day?
a. $1/6$ hours b. 45 minutes c. $2/5$ hours d. None of these.

Directions : Questions 16 to 22 are to be answered with the help of the following bar graph.

The following graphs give the cumulative distance covered by two trains at hourly intervals, beginning with the first hour.

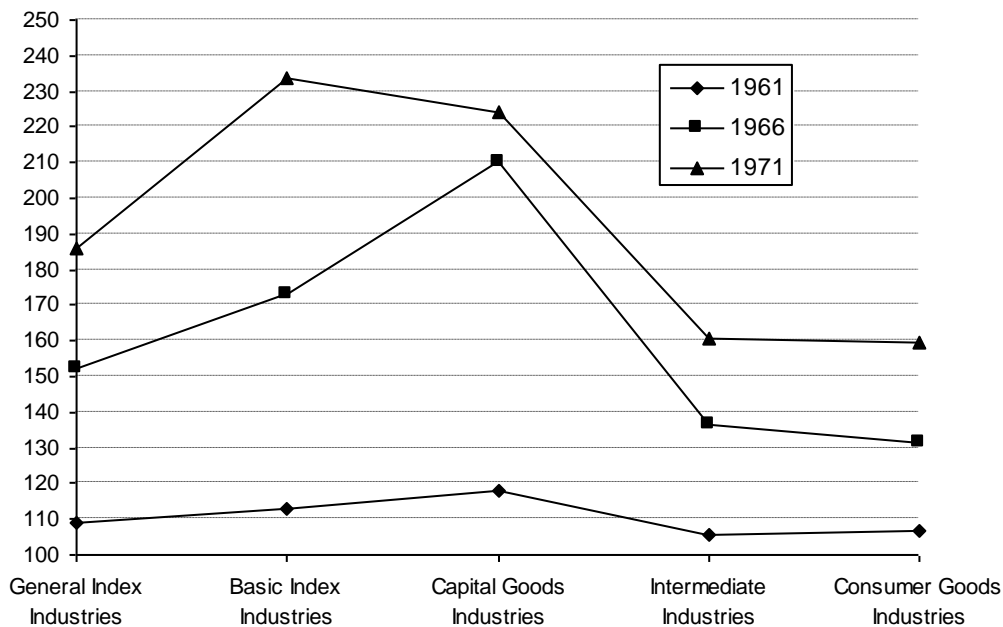




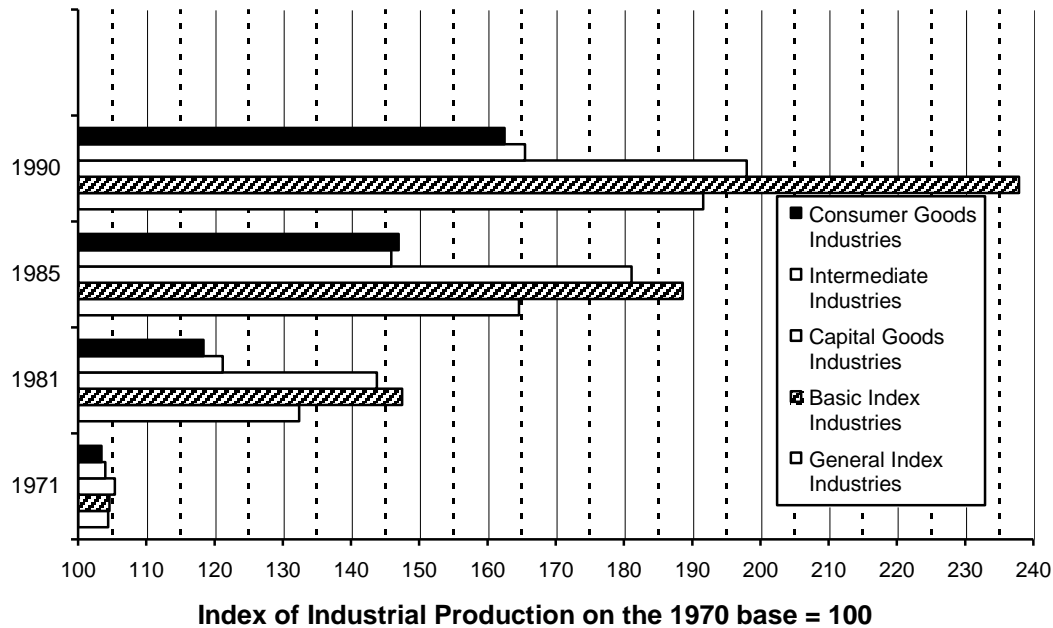
NOTE: Use the data given in the question if required.

16. If the two trains coming from two different stations and moving towards the other station crossed each other at 6:00 P.M., then what is the distance between the two stations?
a. 440 km b. 380 km c. 410 km d. Indeterminable.
17. For how long did the goods train stop at a station?
a. 15 minutes b. 45 minutes c. 60 minutes d. Indeterminable.
18. What is the average speed of the express train for the journey shown in the graph?
a. 29 kmph b. 32 kmph c. 35 kmph d. Insufficient data.
19. What is the average speed of the goods train after crossing the express train for the journey shown in the graph?
a. 25 kmph b. 30 kmph c. 35 kmph d. Indeterminable.
20. If the express train continues at the average speed during its final hour mentioned above, at what time will it reach the station from which the goods train started?
a. 10:32 P.M. b. 11:05 P.M. c. 11:24 P.M. d. None of these.
21. If the goods train covers the remaining distance just before the end of the day, what will be its average speed for the entire journey?
a. 24 kmph b. 29 kmph c. 37 kmph d. None of these.
22. If between 12 noon and 3 p.m., the goods train, whenever it travelled, had done so at a speed of 40 kmph, for how long had it stopped?
a. 2 hours b. 105 minutes c. 90 minutes d. None of these.

Directions : For questions 23 to 30, refer to the following graphs.



Index of Industrial Production on the 1960 base = 100

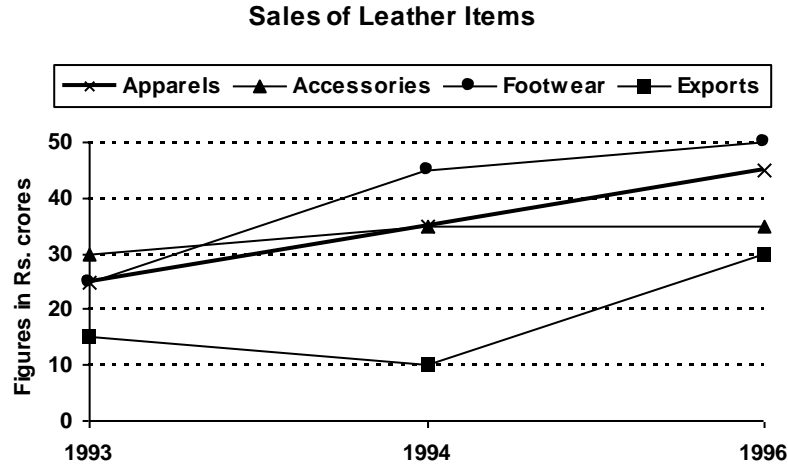


23. What would have been the index in 1966 for intermediate industries on the 1970 base?
 - a. 72
 - b. 81
 - c. 90
 - d. 99
24. What would have been the basic index in 1981 on the 1960 base?
 - a. 360
 - b. 330
 - c. 300
 - d. 270
25. By what percent has the production of consumer goods industries increased from 1961 to 1990?
 - a. 172.5%
 - b. 151.1%
 - c. 135.5%
 - d. 111.8%
26. If the given data is at constant prices, say at 1971 prices; and between 1971 and 1981 the rupee witnessed a 15% depreciation in its value; what was the index corresponding to intermediate industries in 1981 on the 1970 base at current prices?
 - a. 112.6
 - b. 142.5
 - c. 73.9
 - d. 90.8
27. If the general index of 1995 had to show a 3.8 times increase over 1961, what must its index value correspond to on the 1970-base?
 - a. 212
 - b. 295
 - c. 347
 - d. Indeterminable.
28. If the number of radios and stereos produced in 1966 was 21000 and they come under consumer durables, what was their number in the year 1990?
 - a. 33100
 - b. 35300
 - c. 36900
 - d. Indeterminable.
29. Suppose the given table is at current prices and on an average, the rupee depreciates at 10% every 5 years, what would be the index for capital goods industries for 1985 on the 1970-base at constant prices?
 - a. 132
 - b. 174
 - c. 86
 - d. 71
30. During which of the following years did the basic index industries show maximum percent increase over the previous year?
 - a. 1971
 - b. 1981
 - c. 1985
 - d. 1990



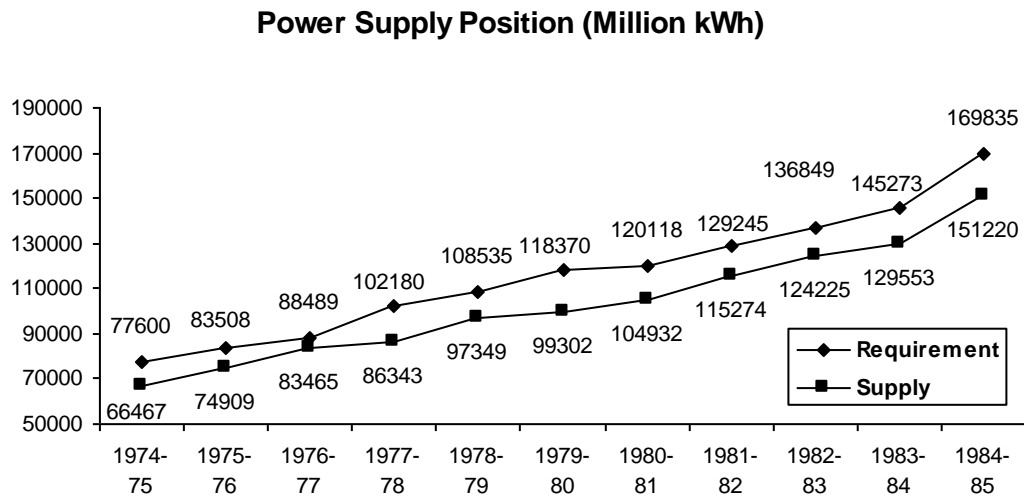
Exercise - 3(A)

Directions: Answer questions 1 to 7 with the help of the following graph.



- The percentage increase in the sales of accessories between 1993 and 1994 was
a. 25% b. 14.75% c. 16.66% d. 20%
- The percentage of sales of apparels to total sales between 1993 and 1994
a. increased by 1.7 b. increased by 2.5 c. decreased by 3 d. decreased by 3.5
- In 1994, if 20% of the footwear sold within the country had been additionally exported at the local price, the percentage increase in export income from 1993 to 1994 would have been
a. 50% b. 31.5% c. 25% d. 26.6%
- The sales of footwear touched Rs.80 crore in 1995, the average annual percentage growth of footwear in 1993-94 and 1994-95 will be
a. 110% b. 78.85% c. 85% d. 95%
- If the sale of apparels is to register the same percentage increase between 1994 and 1995 as it had registered between 1993 and 1994, the sale figure in 1995 of apparels must be
a. Rs. 45 crore b. Rs. 49 crore c. Rs. 51 crore d. Rs. 55 crore
- What is the annual simple growth rate of footwear from 1993 to 1996?
a. 25 % b. 33.33% c. 50 % d. None of these.
- The total sales of 1993 is how many times the increase of 1996 total sales over 1994 total sales?
a. 1.6 b. 2.7 c. 3.5 d. Indeterminable.

Directions : Questions 8 to 14 are to be answered with the help of the following graph.



8. What percentage of the power requirement was met during the year 1980-81?
a. 80% b. 83.5% c. 87% d. 92%
9. By what percentage did the supply of power grow between 1981-82 and 1984-85?
a. 24% b. 31% c. 38% d. 45%
10. In which of the following years was the percentage of shortfall to the requirement the least?
a. 1979-80 b. 1980-81 c. 1982-83 d. 1984-85
11. What approximately is the percentage increase in the requirement of power from 1974-75 to 1984-85?
a. 120% b. 150% c. 180% d. 220%
12. Which was the period during which the growth of requirement of power was the least?
a. 1975-77 b. 1979-81 c. 1982-84 d. 1983-85
13. Which was the period during which there was the greatest addition to the availability of power supply?
a. 1974-76 b. 1977-79 c. 1980-82 d. 1983-85
14. The increase in the requirement of power during 1980-85 was what percent of the increase in the requirement of power during 1975-80?
a. 25% b. 85% c. 100% d. 140%



Directions: For questions 15 to 20, refer to the following table.

**Monthly Per Capita Consumer Expenditure on different items
(Percentage Distribution)**

Item/year	Rural			Urban		
	1983	1978	1973	1983	1978	1973
Cereals	36.3	37.4	46.0	22.9	24.4	27.2
Milk	7.5	7.7	7.3	9.2	9.5	9.3
Oils	4.0	3.6	3.5	4.8	4.6	4.8
Meat	3.0	2.7	2.5	3.6	3.5	3.3
Vegetables	4.7	3.8	3.6	5.0	4.4	4.4
Fruits	1.4	1.1	1.1	2.1	2.0	2.0
Sugar	2.8	2.6	3.8	2.5	2.6	3.6
Other Foods	5.8	5.5	5.2	9.0	9.0	9.9
Food Total	65.6	64.3	72.9	59.1	60.0	64.5
Intoxicants	3.0	2.9	3.1	2.4	2.4	2.8
Fuel	7.0	6.0	5.6	6.9	6.4	5.6
Clothing	8.6	8.7	7.0	7.6	7.0	5.3
Footwear	1.0	0.7	0.5	1.1	0.6	0.4
Durables	2.3	7.0	2.2	2.3	8.9	2.2
Miscellaneous	12.5	10.3	8.7	20.5	14.6	19.2
Non-food Total	34.4	35.7	27.1	40.9	40.0	35.5

15. The percentage per capita expenditure on food registered what percentage decrease between 1973 and 1983 (for urban consumers)?
a. 8.4% b. 9.2% c. 10.5% d. Insufficient data.
16. If the total per capita expenditure in an urban household in 1973 was Rs. 531, approximately how much of it was spent on sugar?
a. Rs 16.80 b. Rs 18.30 c. Rs 19.1 d. None of these.
17. If the total per capita expenditure in 1978 in the rural areas was Rs. 580, how much of it was spent on clothing?
a. Rs 46.20 b. Rs 48.20 c. Rs 50.60 d. Rs 51.70
18. In 1983, if the rural and urban per capita expenditures were Rs. 665 and Rs. 765 respectively, what was the difference between their per capita expenditures on food items?
a. Rs 15 b. Rs 19 c. Rs 21 d. None of these.
19. In 1973, in the rural areas, the per capita expenditure on oil formed what percent of the per capita expenditure on vegetables?
a. 97.2% b. 99.4% c. 102.5% d. None of these.
20. In 1978, the per capita expenditure on non-food items formed what percent of the per capita expenditure on food items, in the urban area?
a. 55.5% b. 66.6% c. 60% d. None of these.

Exercise - 3(B)

Directions : Questions 1 to 5 are to be answered with the help of the information given below.

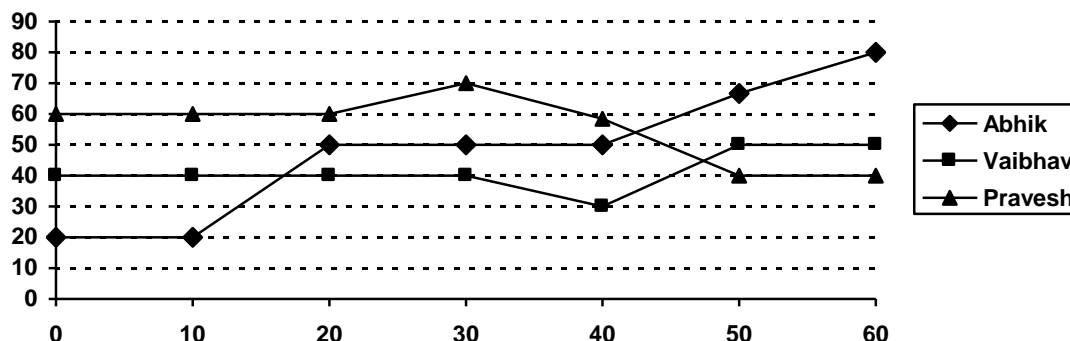
The Oolta – Seedha Trading Corporation and the Tedha – Medha Trading Corporation are rivals operating in the same market segment. These organisations adopt various strategies, P, Q or R, in order to outdo each other. The following table gives the respective payoffs and the respective expenses involved on account of following a particular strategy. For example, if the Tedha – Medha Trading Corporation adopts strategy Q and the Oolta – Seedha Trading Corporation adopts strategy P, then the Tedha – Medha Trading Corporation gains Rs. 12000 while the Oolta – Seedha Trading Corporation loses Rs. 12000. In addition to this, the Oolta – Seedha Trading Corporation and the Tedha – Medha Trading Corporation also have to incur the expenses for the strategy adopted.

Payoffs for Tedha – Medha Trading Corporation				
Tedha – Medha Trading Corporation		Oolta – Seedha Trading Corporation		
	Strategy	P	Q	R
	P	15000	21000	15000
	Q	12000	-4000	0
	R	15000	24000	9000
Expenses				
	Strategy	P	Q	R
Oolta – Seedha Trading Corporation		13500	12000	17500
Tedha – Medha Trading Corporation		15000	6000	17500

- If the Oolta – Seedha Trading Corporation adopts strategy P, which strategy should the Tedha – Medha Trading Corporation adopt for maximum gains?
a. P b. Q c. R d. Indeterminable.
- If the Oolta – Seedha Trading Corporation adopts strategy Q, what is the Tedha – Medha Trading Corporation's maximum gain?
a. 2400 b. 2100 c. 6500 d. 6000
- If the Tedha – Medha Trading Corporation adopts strategy Q, what strategy should the Oolta – Seedha Trading Corporation adopt in order to minimise the Tedha – Medha Trading Corporation's gain, regardless of what its own gain will be?
a. P b. Q c. R d. Indeterminable.
- Which of the following options suggest the most favourable strategy to be adopted by the Oolta – Seedha Trading Corporation?
a. If the Tedha – Medha Trading Corporation adopts strategy P, adopt strategy P.
b. If the Tedha – Medha Trading Corporation adopts strategy Q, adopt strategy R.
c. If the Tedha – Medha Trading Corporation adopts strategy Q, adopt strategy Q.
d. If the Tedha – Medha Trading Corporation adopts strategy R, adopt strategy R.
- If both organisations adopt strategy R, then which of the following is true?
I. The Tedha – Medha Trading Corporation's net gain is 9000.
II. The Tedha – Medha Trading Corporation's net loss is 8500.
III. The Oolta – Seedha Trading Corporation's net loss is 26500.
a. I & II b. II & III c. I & III d. None of these.

Directions: Questions 6 to 10 are based on the following graph.

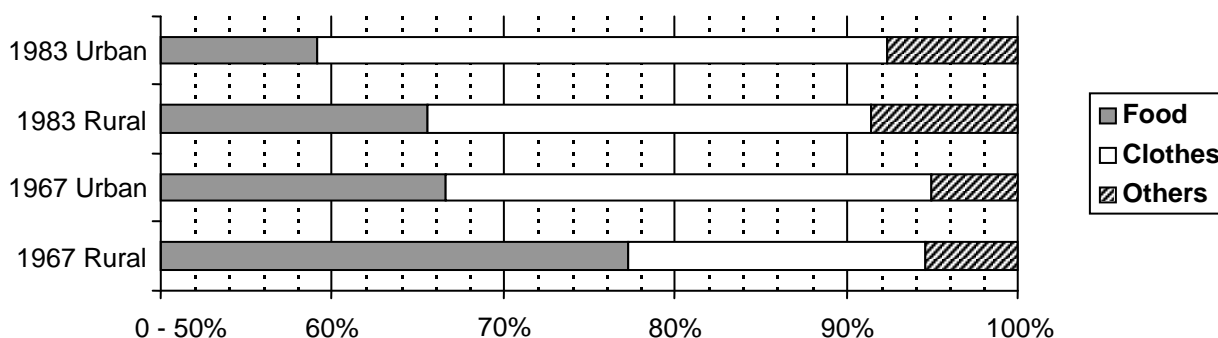
Three friends - Abhik, Vaibhav and Pravesh - decided to travel from Pune to Mumbai on their two-wheelers. The following graph shows the speed (in kmph, on the y-axis) with which each of them moved during different phases of distances (in km).



6. The time taken by Vaibhav to cover the distance from 40 km to 50 km is
a. 15 minutes b. 30 minutes c. 45 minutes d. 50 minutes
7. What part of the total distance covered by all three was travelled with zero acceleration?
a. $\frac{1}{2}$ b. $\frac{11}{18}$ c. $\frac{5}{9}$ d. None of these.
8. The time in which Vaibhav has covered the first 16 km, Pravesh has covered approximately (in km)
a. 20 b. 23 c. 25 d. 30
9. The ratio of time taken by Abhik to cover the distance between 10 and 20 km to that taken by Vaibhav to cover between 50 and 60 km is
a. 10 : 7 b. 1 : 1 c. 5 : 3 d. None of these.
10. What part of the total distance travelled by Pravesh was covered with uniform acceleration?
a. $\frac{1}{2}$ b. $\frac{1}{3}$ c. $\frac{1}{6}$ d. Insufficient data.

Directions: Questions 11 to 18 are to be answered on the basis of information available in the following bar graph.

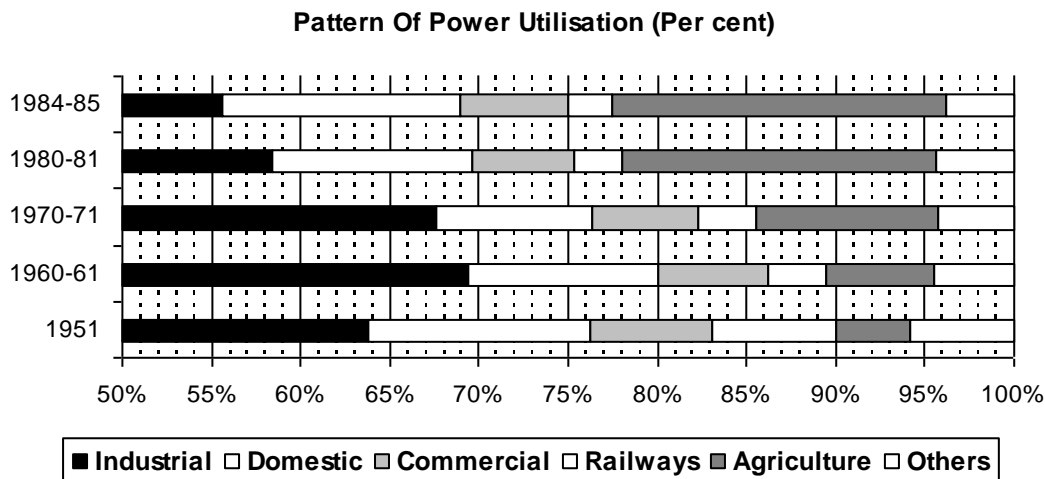
Per Capita Consumer Expenditure (percentage)



11. If the average per capita expenditure per month in the rural area was Rs 85 in 1967, and Rs 175 in 1983, what was the increase in the average amount spent in a month on food between these two years?
a. Rs 23 b. Rs 49 c. Rs 60 d. Rs 76
12. If the total per capita expenditure in the urban areas in 1983 was 1.1 times the total per capita expenditure in the rural areas, then the per capita expenditure on food was
a. more in rural areas b. more in urban areas
c. both are exactly equal d. cannot be determined

13. If the per capita expenditure per month in the urban area was Rs.135 in 1967 and Rs.340 in 1983, what was the increase in the average amount spent on clothing in the urban area in a year?
a. Rs 210 b. Rs 360 c. Rs 762 d. Rs 890
14. In the previous problem, if the value of the rupee would have declined from Re 1 in 1967 to 58 paise in 1983, the average urban per capita expenditure on food in 1983 at 1967 prices would have...
a. increased by 10% b. decreased by 10% c. increased by 30% d. increased by 15%
15. Between 1967 and 1983, in the urban household, the percentage of per capita expenditure on food and clothing together to the total expenditure
a. decreased by 3.5 b. decreased by 2.6 c. increased by 3.5 d. Indeterminable
16. If in the urban area in 1983, 30% of the money spent on clothes were utilised for office wear, what was the money spent on casual wear? (Use required data from Q.13)
a. Rs 75 b. Rs 38 c. Rs 56 d. Indeterminable
17. In the rural area in 1989, the per capita expenditure pattern was the same as that of the 1983 urban area. The annual per capita income was Rs.30000. If the expenditure on education formed 40% of the Others, what was the monthly expenditure on education in rural areas in 1989?
a. Rs 66 b. Rs 76 c. Rs 84 d. None of these.
18. If in the urban areas, contribution towards religious purposes constituted 10% of the 'Others' in 1967, what was the total amount spent on religious purposes in 1967? (Use data from Q.13 if required)
a. 62.5 paise b. 67.5 paise c. 75 paise d. Insufficient data.

Directions : Questions 19 to 26 are based on the following bar graph.



19. In 1980-81, the power utilised by the agriculture sector was what fraction of the power utilised by the industrial and commercial sectors together?
a. 25% b. 29% c. 32% d. 35%
20. If the total power utilised was 170000 million kWh in 1984-85, how much was consumed by the domestic sector in that year? (in million kWh)
a. 19500 b. 23000 c. 24500 d. 32500
21. If the total consumption in 1980-81 was 120000 million kWh, and in 1984-85 it was 170000 million kWh, by how much did the consumption of the industrial sector increase during this period?
a. 18 billion kWh b. 24 billion kWh c. 28 billion kWh d. 32 billion kWh



22. Using data from the previous question, what was the percentage increase in the consumption of power in the domestic sector between 1980-81 and 1984-85?
a. 50% b. 59% c. 66% d. 72%
23. If the total power consumption in 1970-71 was 61200 million kWh, and in 1984-85 it was 170000 million kWh; by how many times did the consumption in the agricultural sector increase from 1970-71 to 1984-85?
a. 4.2 times b. 5.3 times c. 6 times d. 7 times
24. Using data from the previous question, what was the increase in the consumption for railway traction between 1970-71 and 1984-85 in million kWh?
a. 1800 b. 2300 c. 4500 d. 23000
25. What was the percentage increase in power consumption in the commercial sector between 1970-71 and 1980-81? (Use data from previous questions if necessary.)
a. 63% b. 75% c. 80% d. 97%
26. If power supply to charitable institutions and other social service units, at concessional rates, constitute 30% of the supply to others, and they pay at Rs 1.25 per kWh, what was the revenue generated (in Rs crore) because of these units and institutes in 1984-85? (Use data from previous questions, if required)
a. 2.5 b. 25 c. 250 d. None of these.

Directions: Answer questions 27 to 30 with the help of the following information.

A factory uses two machines, M_1 and M_2 to manufacture three products, X, Y and Z. The two machines operate 12 hours a day each from 8 a.m to 8 p.m. The efficiency of the two machines with respect to the three products is given in the table below. The numbers indicate the time taken (in minutes) by the two machines to manufacture one unit of the three products.

	M_1	M_2
X	15	28
Y	20	18
Z	35	24

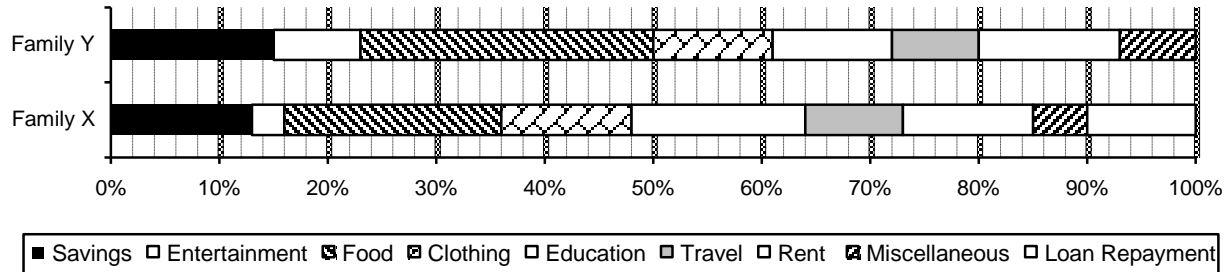
27. What is the maximum number of units that can be produced in a day?
a. 144 b. 88 c. 164 d. 62
28. On a particular day, the factory obtains an order to manufacture 35 units of X and 30 units of Z. What is the maximum number of units of Y that can be manufactured on that day?
a. 9 b. 12 c. 6 d. 18
29. A unit of Z has to be produced only after one unit each of X and Y is ready. The next units of X and Y can be produced only after the previous set of all the three has been produced. What are the minimum extra machine-minutes required for manufacturing 20 units of Z on a day?
a. 840 b. 240 c. 185 d. None of these.
30. What is the maximum number of units manufactured if the machine M_1 is used to manufacture units of X only and the machine M_2 is used to manufacture units of Z only?
a. 62 b. 78 c. 88 d. 94

Exercise - 4(A)

Directions: Questions 1 to 7 are to be answered on the basis of information available in the following bar graph.

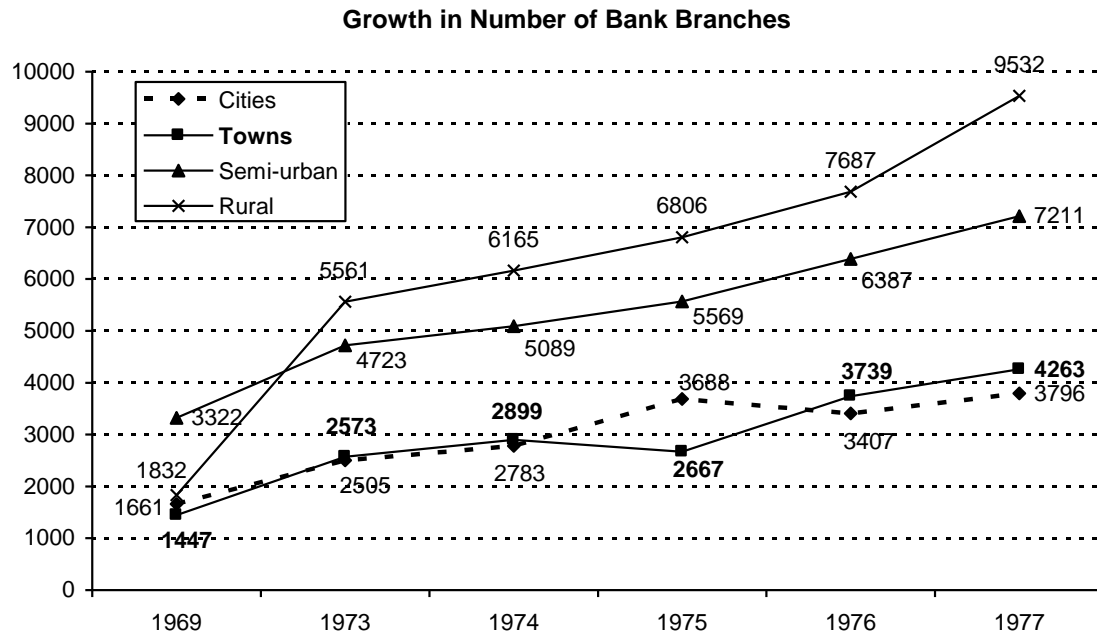
Families X and Y have monthly incomes of Rs. 2400 and Rs. 1800 respectively.

MONTHLY BUDGET OF TWO FAMILIES



- What is the difference between the percentages of savings of the two families?
a. 0 b. 1 c. 2 d. 3
- What is the difference between the monthly savings of the two families? (in Rupees)
a. 32 b. 42 c. 72 d. 100
- What is the annual repayment of loans of Family X?
a. Rs 2400 b. Rs 2800 c. Rs 2160 d. Rs 2880
- Compared to family Y, family X's expenditure on travel is more by what percent?
a. 1% b. 50% c. 75% d. 25%
- What is the combined expenditure of both the families on entertainment?
a. Rs 72 b. Rs 144 c. Rs 186 d. Rs 216
- If the above bar graphs are converted to pie charts, what will be the angle at the centre of the sector for clothing for Family X?
a. 22.5° b. 42.3° c. 43.2° d. 45°
- On which item does family Y spend twice the amount that family X spends on?
a. Food b. Entertainment c. Miscellaneous d. Rent

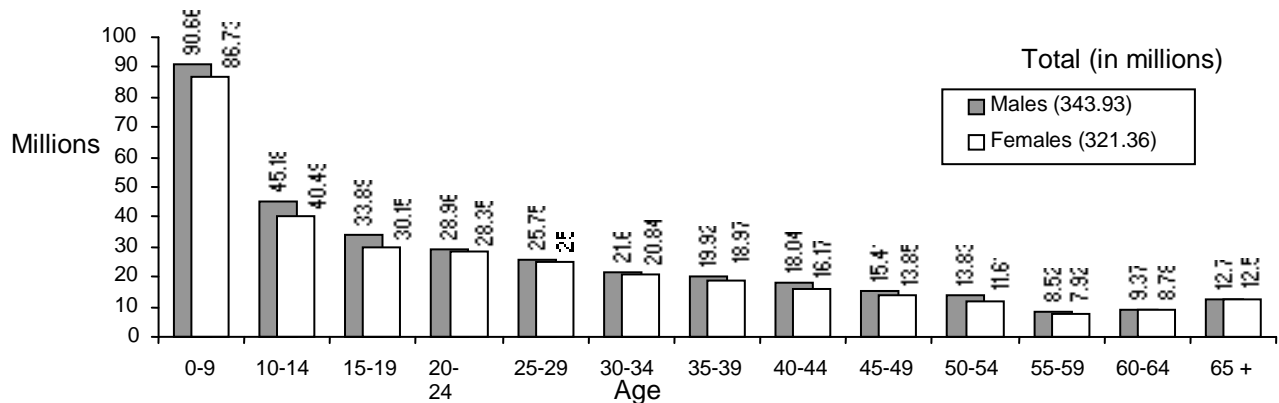
Directions: Answer questions 8 to 14 with the help of the following graph.



8. The growth in the number of rural bank branches from 1969 to 1977 was
a. 11589 b. 7400 c. 7700 d. 5855
9. The category of branches that has shown the maximum growth in number is
a. Rural b. Semi-urban c. Towns d. Cities
10. The period during which there has been the least growth in the number of rural branches is
a. 1969-73 b. 1973-74 c. 1974-75 d. 1975-76
11. The year in which the rural branches formed the least proportion of the total number of branches is
a. 1969 b. 1973 c. 1975 d. 1977
12. The number of branches in the cities increased by what number from 1974 to 1977?
a. 1013 b. 708 c. 7866 d. 9752
13. The growth in the number of semi-urban branches formed what percentage of the total growth of all branches between 1969 and 1973?
a. 20 % b. 29 % c. 33 % d. 85 %
14. The category that has shown the least growth in number over the given period is
a. Rural b. Semi-urban c. Towns d. Cities

Directions: For questions 15 to 20, refer to the following bar graph.

Population by Age & Sex : 1981



15. What is the total number of females per 1000 of the population in 1981?
a. 510 b. 504 c. 499 d. 483
16. Those aged 50 or above formed what percentage of the total population in 1981?
a. 24% b. 20% c. 18% d. 13%
17. Among the number of people of 1981, those who had been born in British India formed what percentage?
a. 45% b. 35% c. 28% d. 17%
18. What percent of the population aged less than 30, are females?
a. 40% b. 43% c. 48% d. 52%
19. Teenaged males formed what percent of females in their twenties in 1981?
a. 65% b. 90% c. 125% d. Insufficient data
20. If the population of 1991 was 843 million, what was India's percentage growth for that decade?
a. 18% b. 22% c. 26% d. 32%



Exercise - 4(B)

Directions: Questions 1 to 4 are based on the following table.

Harpreet conducted a survey on a particular company and obtained the following data. Income tax is paid from Profit Before Tax and the remaining amount is apportioned to Dividend and Retained Earnings. The Retained Earnings are accumulated into Reserves. The Reserves at the beginning of 1991 were Rs 80 lakh.

(Fig. In Rs. lakh)	1994	1993	1992	1991
Share Capital	0310	0205	0098	0098
Sales	6435	4725	2620	3270
Profit Before Tax	0790	0525	0170	0315
Dividends	0110	0060	0030	0030
Retained Earnings	0400	0245	0070	0140

- In which year was the sales per rupee of share capital the highest?
a. 1991 b. 1992 c. 1993 d. 1994
- In which year was the percentage addition to reserves over the previous year's reserves the highest?
a. 1991 b. 1992 c. 1993 d. 1994
- In which year was the tax per rupee of profit before tax the lowest?
a. 1991 b. 1992 c. 1993 d. 1994
- In which year was the profit before tax per rupee of sales the highest?
a. 1991 b. 1992 c. 1993 d. 1994

Directions: Answer questions 5 to 7 with the help of the following information.

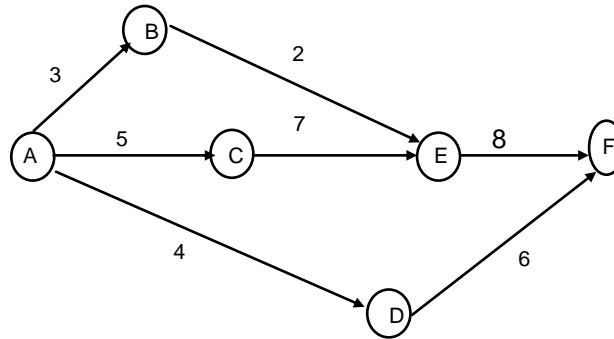
A factory uses two machines, M_1 and M_2 to manufacture three products, X, Y and Z. The two machines operate 10 hours a day each. The efficiency of the two machines with respect to the three products is given in the table below. The numbers indicate the time taken (in minutes) by the two machines to manufacture one unit of the three products.

	M_1	M_2
X	14	18
Y	12	9
Z	15	15

- What is the maximum number of units that can be produced in a day?
a. 108 b. 80 c. 116 d. 92
- What is the maximum number of units that can be manufactured on a particular day if the factory decides to manufacture units of X and Z only? (Assume that only one type of product can be produced on a machine.)
a. 73 b. 82 c. 80 d. 75
- The organisation decides that an equal number of units of the three types should be manufactured each day. The organisation calculates the efficiency of a machine as thrice the reciprocal of half the maximum number of units of the three types. What is the ratio of the efficiency of the second machine to that of the first?
a. 1:1 b. 0.97:1 c. 1.08:1 d. 0.92:1

Directions: Questions 8 to 10 are based on the following data.

The Zatkan Electricity Corporation has undertaken to set up a 5786 MW power plant at Bijlepur. The following network gives details about the time required (in days) for various activities to be undertaken to complete the project. The regular cost of each activity is 50 times the time required to complete it and the regular cost of the project is calculated as 50 times the sum of durations of all activities.



8. What is the minimum duration of the project?
a. 20 days b. 35 days c. 10 days d. 5 days
9. The Zatkan Electricity Corporation has the option to complete the project by reducing the time required for various activities. However, by reducing the time required to complete a particular activity, in addition to the regular cost of the project, the Corporation has to incur an expense that amounts to 150 times the new duration of the activities whose normal time period has been changed. The Corporation decides to reduce the duration of the project by 2 days. In order to achieve this, the Corporation decides to reduce the time required to complete the activities with the maximum duration by 1 day each. What is the percent change in the cost to the Corporation?
a. 205% b. 105% c. 112% d. None of these.
10. The duration of activities (A – C) and (E – F) is reduced by 2 and 5 days respectively. Referring to the previous question, what percent of the cost of the project is formed by the additional expenses?
a. 53.5% b. 42.8% c. 34.8% d. None of these.

Directions : Questions 11 to 15 are to be answered on the basis of the following information.

There were three participants R1, R2 and R3 in a cross-country car race. All three started the race at 9.00 a.m. The following table gives the timings of the three riders at various stages. Everybody has to stop for ten minutes after every 60 km for refuelling.

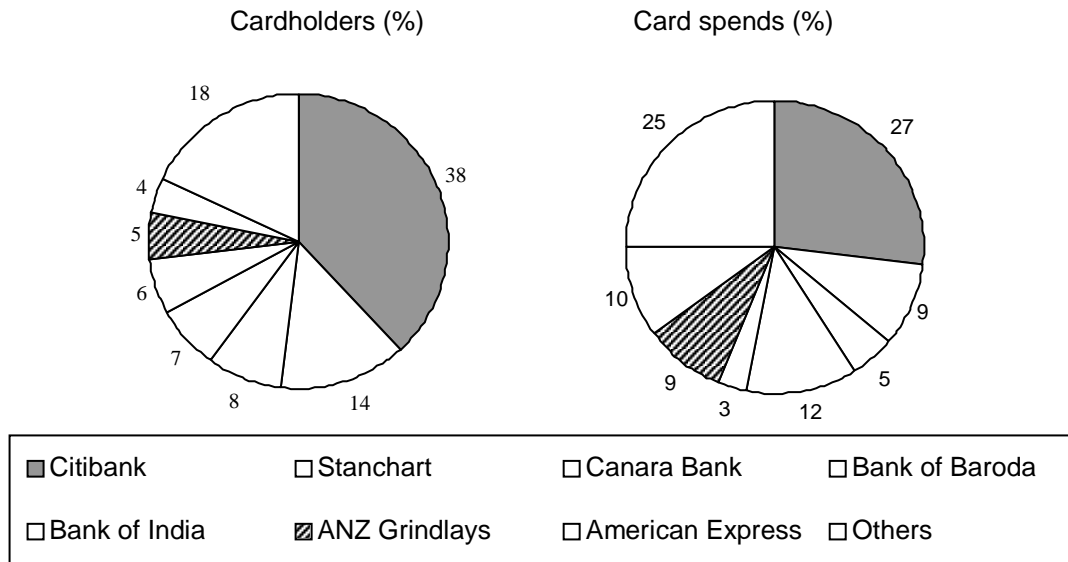
Distance	R1	R2	R3	Distance	R1	R2	R3
30	9.35	9.40	9.37	210 km	12.30	12.30	12.30
60	10.00	10.05	10.02	240 km	12.55	13.00	12.57
90	10.35	10.45	10.40	270 km	13.30	13.40	13.40
120	11.00	11.10	11.05	300 km	14.00	14.05	14.05
150	11.30	11.45	11.40	330 km	14.30	14.30	14.45
180	12.00	12.05	12.00	360 km	14.45	14.47	14.59

11. The actual running time of R1 to cover the first 150 km is how many minutes more than the actual running time of R3 to cover the last 90 km?
a. 51 minutes b. 61 minutes c. 130 minutes d. 55 minutes
12. If R1 and R2 moved with constant speed from 210 km to 300 km, than the ratio of speeds of R1 and R2 during 210 km and 300 km is...
a. 16 : 15 b. 17 : 16 c. 16 : 17 d. None of these



13. The running time taken by R1 to cover the distance between 300 and 360 km is what part of the running time taken by R2 to cover the distance between 240 and 330 km?
a. 1 : 2 b. 1 : 3 c. 1 : 4 d. 3 : 1
14. The ratio of speeds of R1, R2 and R3 between 60 and 90 km is (assuming they move at constant speeds)...
a. 84 : 75 : 70 b. 70 : 75 : 84 c. 84 : 70 : 75 d. 35 : 42 : 38
15. If they did not stop for refuelling at any stage of the race, then the person who comes last would be...
a. R1 b. R2 c. R3 d. Indeterminable

Directions: Questions 16 to 22 are based on the following pie-charts.



The number of cardholders in 1996 was 8.5 million, while card spendings amounted to Rs. 64 crore.

16. What is the difference between the number of people who own Citibank cards and Bank of Baroda cards?
a. 25.85 lakh b. 26.35 lakh c. 26.95 lakh d. 27.4 lakhs
17. What is the difference between the amounts spent through Citibank and ANZ Grindlays cards? Answer in Rs. crore.
a. 11.52 b. 12.08 c. 12.72 d. Indeterminable
18. If the owners of Cancard (Canara Bank's) do not own any other card, what is their actual number?
a. 6.3 lakh b. 6.55 lakh c. 6.8 lakh d. Indeterminable
19. If 30% of the spendings by the others category is by Mahacard, what is the amount accounted for by the remaining cards of others category? (in Rs. crore)
a. 4.8 b. 11.2 c. 16.2 d. Indeterminable
20. If card efficacy is defined as that percentage of the total purchase which is made through cards by card holders and if the Bank of Baroda card has a 30% efficacy in 1996, what is the approximate amount of purchase (in Rs crore) made by Bank of Baroda card holders during the year 1996? (Assume that Bank of Baroda card holders do not own any other credit cards)
a. 20.25 b. 25.6 c. 30.66 d. 36.33

21. If every second American Express card holder also owns only a Citibank card, and if on an average the amount spent by every card holder is the same and the amounts are equally distributed between the two cards, by those who own two cards, what was the total amount that an AE card holder spent (in Rs crore) by using their cards in 1996?
a. 8.533 b. 8.866 c. 9.116 d. Indeterminable
22. If Stanchart offers one free card to a family member of a cardholder and they spend 40% of the amount spent by the original cardholder, what was the approximate amount (in Rs crore) spent in 1996 only by the family members?
a. 1.2 b. 1.4 c. 1.65 d. Indeterminable

Directions: Questions 23 to 30 are to be answered on the basis of information available in the following table.

EIGHTH PLAN

National Highways	Targets	Achievements
Widening to 2 lanes (km)	1076	852
Widening to 4 lanes (km)	604	323
Strengthening of weak 2-lane roads (km)	3331	3717
Repairs on Bypasses (km)	14	11
Repairs on Major bridges	3	54
Repairs on Minor bridges including railway over-bridges	326	303

23. With respect to the widening of the lanes of national highways, what percent of the targets were achieved during the eighth plan?
a. 65.2% b. 70% c. 74.8% d. None of these
24. With respect to the work done on the bridges, what was the ratio of major bridges to minor bridges during the eighth plan?
a. 1 : 5.5 b. 2 : 9 c. 3 : 14 d. Indeterminable
25. Strengthening of weak 2 lane roads formed what percent of the widening to 2 lane roads with respect to the length over which the work is done during the eighth plan?
a. 336 % b. 436 % c. 363 % d. Indeterminable
26. The difference between the target and achievement for minor bridges was due to the transfer of all the railway over-bridges to a different project, because of which it was possible to complete the entire targeted work on all the other minor bridges. What was the initial ratio of the number of railway over-bridges to the other minor bridges?
a. 1 : 15 b. 2 : 23 c. 1 : 12 d. 3 : 40
27. What percent of the total targets was achieved during the eighth plan?
a. 95% b. 98% c. 101% d. can't be determined
28. The widening to 4 lanes costs Rs. 35 lakh per km. If 24% of the widening is to be done on the Bombay – Poona highway, then what is the cost (in Rs Crore) of widening of the Bombay – Poona highway to 4 lanes during the eighth plan?
a. 4750 b. 5075 c. 5625 d. Indeterminable
29. The percentage of the length of bypasses (in km) to be repaired to that of the number of major bridges to be repaired forms what percent of the percentage of the number of major bridges repaired to the length of bypasses (in km) repaired during the eighth plan?
a. 95% b. 105% c. 115% d. Indeterminable
30. For the strengthening of weak 2 lane roads, 35% of the money was invested by the central government, 15% by the state government and the remaining was funded by international loans during the eighth plan. If the loans are paid in dollars, what is the ratio of the state government's contribution (in rupees) to that of the international loans (in dollars, where 1 dollar = 36 rupees).
a. 9.6 : 1 b. 10.8 : 1 c. 12.5 : 1 d. None of these



Exercise - 5(A)

Directions: Answer questions 1 to 6 with the help of the following table.

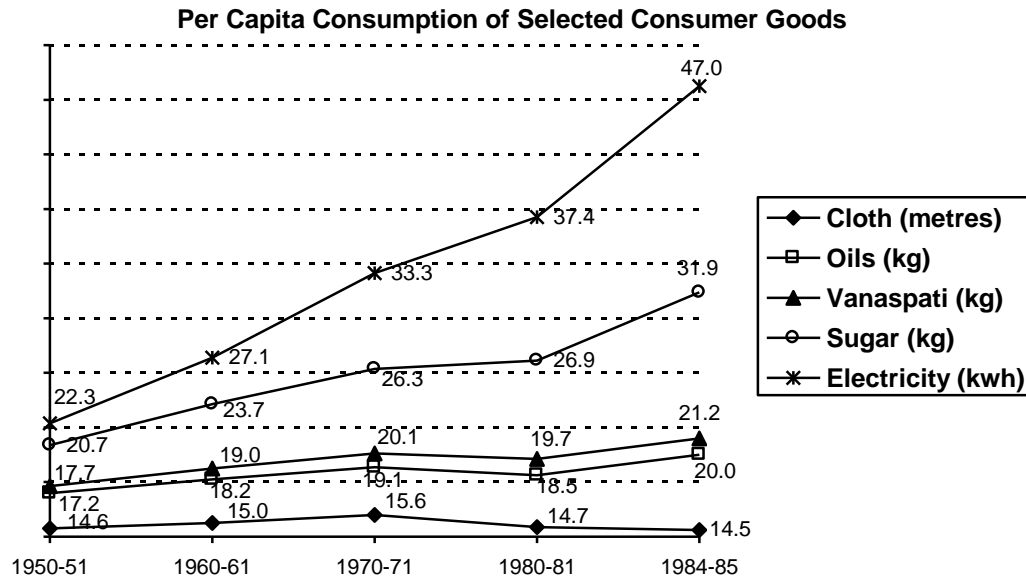
Number of Cities in Highly Urbanised States of India:

States	No. of cities	States	No. of cities
Andhra Pradesh	32	Maharashtra	27
Bihar	17	Punjab	10
Gujarat	19	Rajasthan	14
Haryana	12	Tamil Nadu	25
Karnataka	21	Uttar Pradesh	42
Kerala	14	West Bengal	24
Madhya Pradesh	23		

The total urban population as of 1991 was reported to be 217 million, residing in 4689 cities and towns all over the country. The urban population accounted for 25.7% of the total population of the country.

- What was India's population in 1991?
a. 836 million b. 845 million c. 860 million d. Indeterminable
- What is the difference in the urban and rural population of the country?
a. 377 million b. 394 million c. 411 million d. None of these
- What is the ratio of Kerala's cities urban population to that of Uttar Pradesh's cities urban population?
a. 3 : 1 b. 1 : 3 c. 3 : 10 d. Indeterminable
- What is the approximate ratio of the number of cities in Rajasthan to that in Bihar to that in Madhya Pradesh?
a. 4 : 5 : 6 b. 8 : 10 : 15 c. 1 : 1.2 : 1.6 d. Indeterminable
- If 22% of India's cities and towns are in Uttar Pradesh and Maharashtra, what percent of the number of cities and towns in these two states do the cities in these two states form?
a. 4.27% b. 6.7% c. 8.95% d. None of these
- What is the average number of cities in those states where the number of cities is greater than 20?
a. 26.6 b. 27.7 c. 28.8 d. None of these

Directions: Questions 7 to 13 are based on the following Band Diagram. Use any additional data given in a particular question while solving the questions that follow it.



7. If the population in 1980-81 was 685 million, what was the total consumption (in tonnes) of sugar in the country in that year?
 a. 5.2 million b. 4.7 million c. 4.9 million d. 5.5 million
8. Among concrete items, which commodity registered the maximum percentage increase in the per capita consumption between 1950-51 and 1984-85?
 a. Cloth b. Vanaspati c. Sugar d. Oils
9. If the population in 1970-71 was 550 million, what was the increase (in million tonnes) in the consumption of oils from 1970-71 to 1980-81?
 a. 0.57 b. 0.62 c. 0.68 d. 0.75
10. What was the increase (in million metres) in the consumption of cloth between 1970-71 and 1980-81?
 a. 2050 b. 1490 c. 1760 d. 1610
11. What was the total consumption of electricity (in million kWh) in the year 1960-61, if the population then was 80% of that in 1970-71?
 a. 1496 b. 2080 c. 1340 d. 1410
12. What was the percentage increase in the consumption of cloth between 1960-61 and 1970-71?
 a. 35% b. 4% c. 3% d. 30%
13. If the population in 1950-51 was 360 million, by how many million tonnes did the consumption of Vanaspati increase between 1950-51 and 1980-81?
 a. 0.56 b. 0.64 c. 0.72 d. 0.81



Directions: Questions 14 to 20 are to be answered on the basis of information available in the following table.

Urban Centres with more than One Lakh Population

Population	No. of urban centres	Population	No. of urban centres
Between 1 and 2 lakh	166	Between 9 and 10 lakh	1
Between 2 and 3 lakh	39	Between 10 and 11 lakh	6
Between 3 and 4 lakh	20	Between 11 and 15 lakh	4
Between 4 and 5 lakh	20	Between 15 and 16 lakh	2
Between 5 and 6 lakh	7	Between 16 and 20 lakh	2
Between 6 and 7 lakh	9	Between 20 and 100 lakh	7
Between 7 and 8 lakh	5	Above 100 lakh	2
Between 8 and 9 lakh	8		

According to the 1991 census, there are 298 urban centres with a population of more than one lakh. These centres account for 65% of India's total urban population which is 25.7% of India's population of 84.5 crore.

14. What is the India's total urban population?
a. 141 million b. 209 million c. 217 million d. 222 million
15. How many people, who are a part of India's urban population, do not live in the above mentioned urban centres?
a. 62 million b. 67 million c. 70 million d. None of these
16. If the 2 urban centres, where the population is more than 100 lakh, does not exceed 110 lakh, what percent of the urban population of the 298 centres mentioned in the data, do they approximately form?
a. 5 – 7 % b. 9 – 11% c. 14 – 16% d. 18 – 20%
17. The population of centres with more than 1 lakh population forms what percent of the population of those centres with a population above 20 lakh?
a. 140 b. 115 c. 71 d. Indeterminable
18. The number of urban centres having a population greater than 10 lakh but less than 20 lakh forms what percent of the number of centres having a population above 2 lakh?
a. 10.5% b. 15% c. 12.5% d. Indeterminable
19. If the 1991 census had a 30% increase over the 1981 census, what percent of the Indian population lived in urban centres in 1981?
a. 65% b. 50% c. 35% d. Indeterminable
20. What is the ratio of the number of urban centres with population above odd number categories to that of the number of urban centres with population above even number categories?
a. 11 : 6 b. 5 : 3 c. 11 : 5 d. Indeterminable

Exercise - 5(B)

Directions: Questions 1 to 5 are based on the following data.

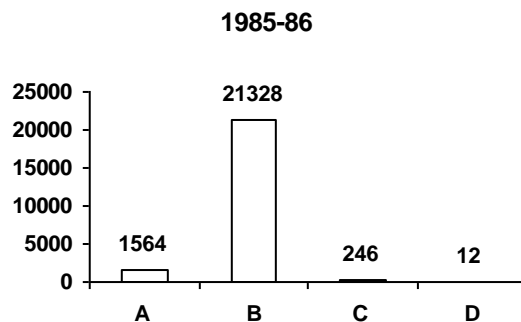
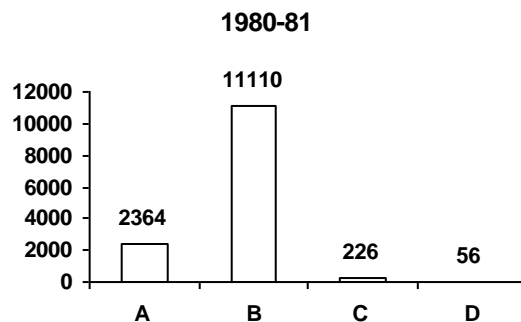
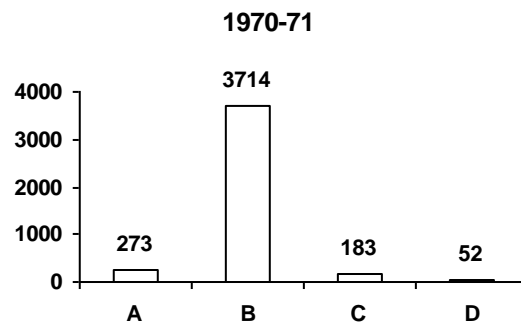
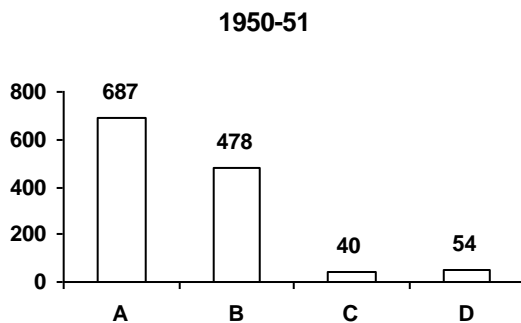
Three trains namely Deccan Express, Indrayani Express and Singhgarh Express moving on parallel tracks start from Pune at the same time to reach Mumbai. Deccan Express follows the equation $S \text{ (in km)} = 30t + 12t^2$; Indrayani Express $S \text{ km} = 36t + 16t^2$; Singhgarh Express S

$$\text{km} = 19t + t^2.$$

- If the distance between Pune and Mumbai is 185 km, then the train to reach Mumbai first without any stoppages is...
a. Deccan Exp. b. Indrayani Exp. c. Singhgarh Exp. d. Indeterminable
- The ratio between distance travelled by Deccan Express in the third hour and distance travelled by Singhgarh Express during the first hour is approximately
a. 2 : 7 b. 9 : 2 c. 5 : 2 d. 5 : 3
- If all three leave from Pune at 9.40 a.m., then the time at which Indrayani Express will reach karjat, which is 70 km from Pune without any stoppages is
a. 10:40 a.m. b. 10:55 a.m. c. 11:05 a.m. d. 10:52 a.m.
- If Indrayani Express follows the equation $S = 9t^2 + 17t$, then the answer to the previous question will be
a. 10:55 a.m. b. 11:24 a.m. c. 11:40 a.m. d. None of these
- The time taken by Singhgarh Express to cover the distance travelled by Deccan Express during the first hour is
a. 1 hour b. 1 hour 30 minutes c. 2 hours d. None of these

Directions: Questions 6 to 13 are to be answered on the basis of information available in the following bar graphs.

RESERVE BANK ASSETS (in Rs Crore)



A. Foreign Securities

B. Rupee Securities

C. Gold coins & Bullion

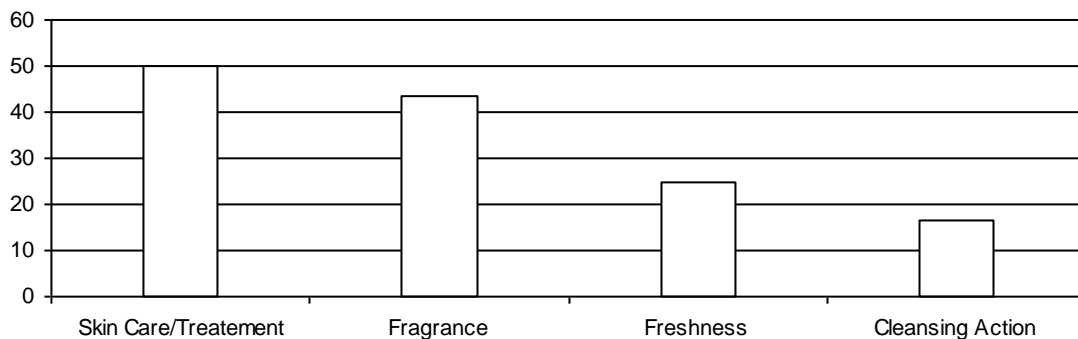
D. Rupee coins



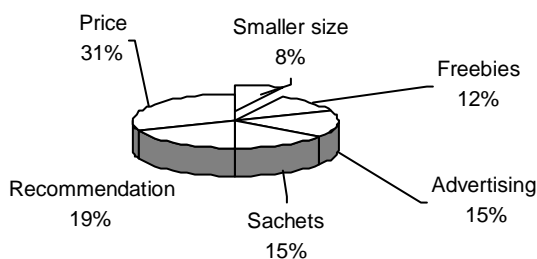
6. The total assets of the RBI in the years 1980-81 and 1985-86 combined were
a. Rs 35906 crore b. Rs 36906 crore c. Rs 35806 crore d. Rs 36806 crore
7. If the value of gold coins with the RBI exceeded that of the other bullion by 25% in 1980-81, what was the value of other bullion?
a. Rs 100.25 crore b. Rs 111.5 crore c. Rs 95.5 crore d. Rs 87.75 crore
8. The proportion of rupee securities to foreign securities in 1950-51 was
a. 0.72 : 0.5 b. 1 : 1.44 c. 1.5 : 1 d. 0.5 : 0.8
9. If the 1970-71 graph is represented as a pie chart, what will be the angle at the centre of the sector relating to rupee securities?
a. 274° b. 317° c. 36° d. None of these
10. If circles are to be drawn to scale, so that their areas are proportionate to the total assets of each year, and the radius of the first circle (1950-51) is 1cm, then the radius of the last circle (1985-86) would be
a. between 2 cm & 3 cm b. between 3 cm & 4 cm
c. between 4 cm & 5 cm d. between 5 cm & 6 cm
11. The percentage of gold coins and bullion in the total assets came down by what percent from 1950-51 to 1985-86?
a. 60% b. 67 % c. 75% d. None of these
12. If the assets and liabilities of the RBI are always equal, and if the notes in circulation formed 92% of the liabilities of the RBI, then the value of the notes in circulation in 1970-71 was
a. 3664 b. 3998 c. 4010 d. None of these
13. If in 1980-81 a U.S. dollar was worth seventeen Indian rupees, what was India's foreign securities in that year in terms of U.S. dollars?
a. 1.39 billion b. 13.5 crore c. 1.45 billion d. None of these

Directions: For questions 14 to 21, refer to the following graphs.

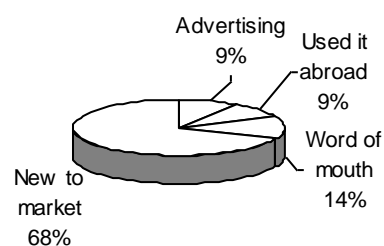
What Consumers want from Liquid Soaps (%).



Reasons for Trial



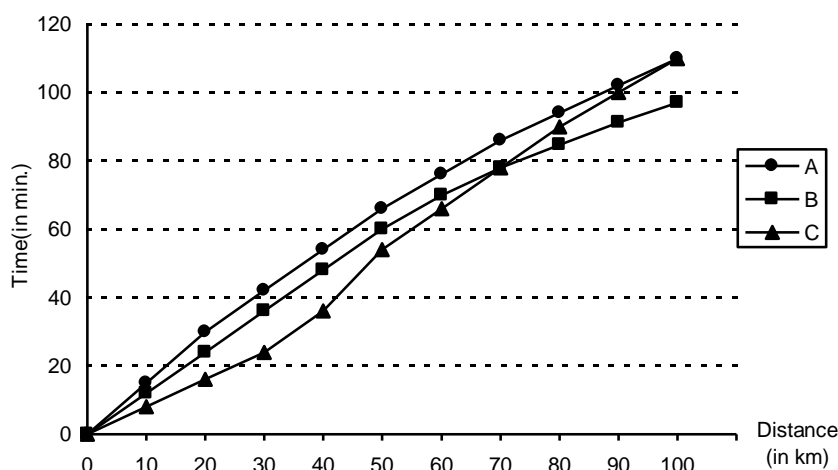
Reasons for Use



14. If 248 users were questioned for the survey, how many wanted the soaps only for medicinal purposes?
a. 42 b. 166 c. 124 d. Indeterminable
15. If 420 people were covered under the survey, how many wanted the soaps to combat body odour?
a. 150 b. 181 c. 169 d. Indeterminable
16. If 851 people were questioned for the above survey, how many wanted the soap for cleansing action?
a. 102 b. 112 c. 122 d. None of these
17. What percent of the people, who tried the soap because of recommendations, continued using it for a mentioned similar purpose?
a. 88.14% b. 84.35% c. 79.86% d. None of these
18. If 302 people were questioned regarding the reason for use, how many of them were foreign returned?
a. 24 b. 21 c. 27 d. Insufficient data
19. Using the data from the above question, how many are first time users?
a. 205 b. 214 c. 223 d. Indeterminable
20. From the 550 people who were questioned about their reasons for trial, how many were stingy/miserly/not ready to spend?
a. 159 b. 181 c. 260 d. Indeterminable
21. Using data from the above question, how people tried it because of some packaging attribute i.e., size and sachets?
a. 126 b. 135 c. 82 d. Indeterminable

Directions : Questions 22 to 26 are to be answered on the basis of information available in the following graph.

There are 3 contestants A, B and C in a 100 km car race. The following graph gives the time which each of them took to cover different phases of the race.



22. If during the first 30 km, B had travelled at a uniform speed of 40 kmph, then the winner would be
a. A b. B c. C d. Indeterminable



23. If it is assumed that C travelled the entire course with constant acceleration, then the final velocity of C is
a. 60 kmph b. 110 kmph c. 145 kmph d. Indeterminable
24. For the race to end in a dead heat, B can give A and C respectively, a start of (in minutes)
a. 10 and 22 b. 22 and 18 c. 18 and 18 d. None of these
25. The average velocity of A over the entire course is
a. 99 kmph b. 65 kmph c. 55 kmph d. 50 kmph
26. Assuming that all of the three moved with uniform speed in the phases of distance given below, which alternative correctly represents them in ascending order?
[p] - Speed of A in between 20 and 40 km.
[q] - Speed of B in between 40 and 70 km.
[r] - Speed of C in between 70 and 90 km.
a. [p], [q], [r] b. [q], [p], [r] c. [r], [p], [q] d. [p], [r], [q]

Directions: Answer questions 27 to 30 with the help of the following information.

Sucharita is a famous floriculturist, who has recently taken over four farms, Aster Gardens (AG), Buttercup Fields (BF), Chrysanthemum Grounds (CG) and Daffodils Acres (DA). When she was going through the Balance Sheets of the four companies, she came across a number of interesting things about them. The profits made by CG and DA were the same, but the sales of CG were the same as those of BF. The profits of AG were 10% of its sales, where as the profits of BF were 20% of its sales. The total expenses of CG were 5 times its profits and the sales of DA were 3 times its profits. The total expenses of CG were Rs. 10 lakh and the total expenses of AG were 10% less than that of CG. Profit is defined as the difference between sales and total expenses.

27. Which farm had the lowest sales?
a. AG b. BF c. CG d. DA
28. Which farm showed the highest profits?
a. AG b. BF c. CG d. DA
29. Which farm incurred the highest total expenses?
a. AG b. BF c. CG d. DA
30. Which farm earned the lowest profit?
a. AG b. BF c. CG d. DA

Exercise - 6(A)

Directions: Answer questions 1 to 8 with the help of the following table.

TELCO's Production Figures in recent years:

Models	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97
1210	20,576	34,574	42,225	53,631	60,100	58,640
LCV's	6,462	10,997	23,832	36,313	45,480	44,230
MCV's	5,495	9,814	8,105	10,431	11,920	11,250
1313	2,595	3,283	8,029	5,343	7,720	6,160
2416	1,729	4,080	7,486	6,957	7,920	8,360
Other trucks	5,557	6,566	6,927	6,287	6,340	5,380
Total trucks	42,414	69,314	96,604	1,18,962	1,39,480	1,34,020
Total cars	8,411	12,704	11,818	10,627	12,890	12,200
of which.....						
(i) T'Mobiles	3,651	6,250	5,199	4,328	4,750	4,550
(II) Estate	1,719	2,066	1,883	1,958	2,580	2,670
Total production	50,825	82,018	1,08,422	1,29,589	1,52,370	1,46,220

- The production of 1210s in 1996-97 was how many times more than their production in 1991-92?
a. 3.1 b. 2.8 c. 1.8 d. 2.4
- What is the percentage of increase in the production of cars between 1991-92 and 1996-97?
a. 28% b. 33% c. 45% d. 56%
- The increase in TELCO's total production during 1993-94 to 1996-97 formed what percentage of the increase during 1991-92 to 93-94?
a. 50% b. 80% c. 66% d. 75%
- The increase in production of LCV's from 1991 to 1997 bears what ratio to the increase in production of 1210's during the same period?
a. 2.5 : 1.5 b. 1 : 1 c. 1.5 : 1 d. 0.75 : 1
- What is the total increase in the production of 1313s, 2416s and MCVs from 1992-93 to 1996-97?
a. 8600 b. 8200 c. 9000 d. 9500
- The increase in production of Estates from 1991 to 1997 formed what percentage of the increase in the production of cars during this period?
a. 25% b. 45% c. 50% d. 65%
- The increase in the total production from 1993-94 to 1994-95 formed what percentage of similar increase from 1991-92 to 1992-93?
a. 44% b. 50% c. 66% d. 75%



Directions: Answer questions 8 to 15 with the help of the following table.

PUNE MUNICIPAL TRANSPORT (PMT) : REVENUE & EXPENDITURE

Year	Revenue	Expenditure		
		Cash	Depreciation	Total
1984-85	401.58	368.14	31.11	399.25
1985-86	483.61	452.66	35.36	488.02
1986-87	619.27	478.62	41.02	519.64
1987-88	668.19	493.68	47.48	541.16
1988-89	762.83	562.41	54.54	616.95
1989-90	835.05	619.31	61.89	701.10
1990-91	910.01	788.14	69.45	857.59
1991-92	1,070.60	926.28	76.85	1,002.13
1992-93	1,290.26	1,030.28	91.10	1,121.38
1993-94	1,462.66	1,176.14	109.97	1,286.11
1994-95	1,660.00	1,408.21	130.00	1,538.21
1995-96	1,880.00	1,610.47	148.40	1,758.87

(Values in Rs. crore)

8. In how many years was there an overall deficit in the functioning of PMT?
a. 1 b. 3 c. 4 d. 0
9. In which year was the surplus generated largest?
a. 1992-93 b. 1993-94 c. 1994-95 d. 1995-96
10. The depreciation formed what percent of the revenue in 1991-92?
a. 70% b. 7.4% c. 8.2% d. 6.5%
11. Between 1990-91 and 1995-96, the revenue increase by what percent?
a. 200% b. 70% c. 106% d. 90%
12. The maximum increase in revenue was registered between
a. 1985-86 & 1986-87 b. 1988-89 & 1989-90 c. 1991-92 & 1992-93 d. 1994-95 & 1995-96
13. By how many percent did the surplus increase between 1986-87 and 1995-96?
a. 120 b. 117.6 c. 116.7 d. 22
14. Ignoring depreciation, what was the cash surplus (in Rs. crore) in the year 1992-93?
a. 169 b. 260 c. 286 d. 144
15. In which of the following years was the total expenditure almost equal to the revenue of the previous year?
a. 1984-85 b. 1985-86 c. 1993-94 d. 1982-83

Directions: Questions 16 to 20 are based on the following data:

INFOSYS TECHNOLOGIES LTD.
(All values in Rs Crores)

Year-ending March 31	1998	1999	2000	2001
Sales (Rs Crores)	327.8	640.12	1170.56	1725.62
Salaries	172.22	258.5	542.4	746.13
Depreciation	21.73	36.57	32.5	18.57
Other Expenses	42.58	64.72	89.54	104.5
Net Profit	101.27	-	-	-
Share capital	16.52	16.52	33.04	41.3
Dividend	4.96	9.08	16.52	22.70
Employees	1650	3726	5624	6478
Reserves	389.7			

Net Profit = Sales - (Depreciation + Salaries + Other Expenses)

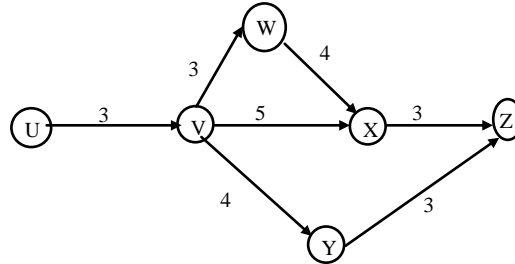
16. What was the percentage increase in net profit in the year 2001 over the year 2000?
a. 65% b. 60% c. 80% d. 70%
17. If in the year 2000, the company had 30% attrition rate, and of the new employees joining in the year 2000-01, 50% are engineers, how many new engineers joined the company during the period 2000-01? (Attrition rate is the ratio of the number of employees leaving the company in the given year to the total number of employees at the start of the year).
a. 1270 b. 1370 c. 1070 d. 1570
18. If face value of infosys share is Rs 5 in yr 2001 what is the net profit per share?
a. Rs 100 b. Rs 50 c. Rs 40 d. Rs 90
19. If after distributing dividend from net profit the remaining amount is transferred to reserves what is the approximate reserves amount at the end of the year 2000?
a. 1130 Cr b. 1140 Cr c. 1150 Cr d. 1160 Cr
20. In which year, the percent net profit was maximum?
a. 1998 b. 1999 c. 2000 d. Indeterminable



Exercise - 6(B)

Directions: Questions 1 to 3 are based on the following network.

The following network gives details about the various activities carried out in a bottling firm for their latest project and the time required for each activity. The average cost incurred in each activity is 5 times the square of the duration of the activity. If the organisation wants to reduce the duration of any particular activity, in addition to the average cost, it will have to incur an amount equal to 15 times the cube of the new duration of the activity.



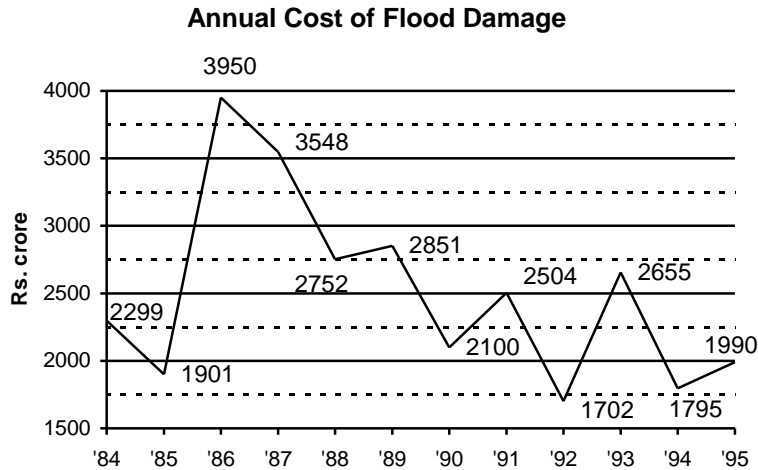
- The completion of one cycle of the network results in one bottle ready to be sold in the market. The project involves a total of 800 bottles. What is the average cost of the entire project?
a. Rs 74400 b. Rs 372000 c. Rs 150000 d. Indeterminable
- If profit is defined as the difference between the selling price and the average cost, and each bottle is sold for Rs. 510, what is the approximate percent profit earned by the firm?
a. 5% b. 10% c. 15% d. Can't be determined
- The firm decides to reduce the duration of activities (U – V), (X – Z) and (Y – Z) by one each and that of activities (V – X) and (W – X) by two each. Referring to the above questions, what will be the firm's percent profit?
a. +122% b. -122% c. +55% d. -55%

Directions: Questions 4 to 6 are based on the following data.

Radhika has a certain amount of property consisting of cash, gold coins and silver bars. The cost of a gold coin is Rs 4000 and that of a silver bar is Rs 1000. Radhika distributed her property among her sons equally. To her eldest son, she gave gold coins worth 20% of the total property and Rs 60000 in cash. To her second son, she gave silver bars worth 20% of the remaining property and Rs 120000 in cash. She gave each of the third and fourth sons an equal number of gold coins and silver bars, each together accounting for 20% of the property remaining after the previous distribution to the first and second sons and the requisite amount in cash.

- What was Radhika's total property worth (in Rs lakh)?
a. 7.5 b. 10 c. 12 d. 12.5
- What is the ratio of the property that Radhika held in gold coins and silver bars?
a. 9 : 19 b. 19 : 9 c. 19 : 36 d. 36 : 19
- If property in the form of gold coins or silver bars is considered as "Wealth", what is the ratio of the "Wealth" that Radhika distributed among her four sons?
a. 5 : 4 : 3 : 2 b. 3 : 3 : 4 : 2 c. 3 : 4 : 3 : 2 d. 4 : 3 : 2 : 2

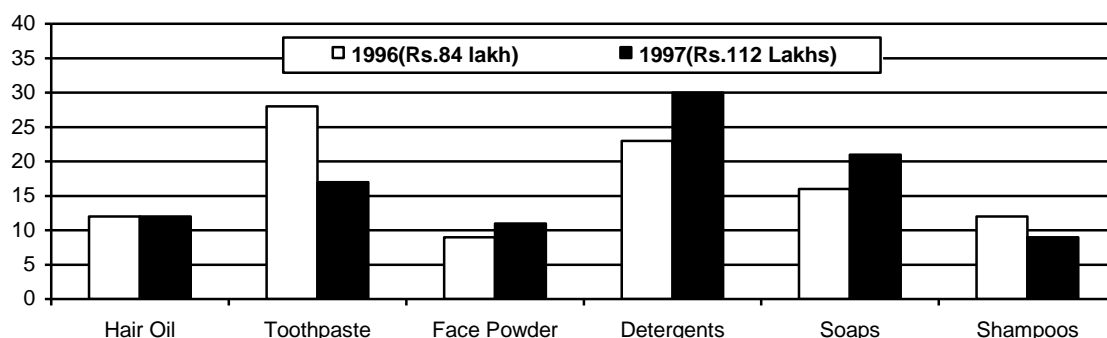
Directions: Questions 7 to 14 are to be answered on the basis of information available in the following graph.



7. From the given choices, which of the set of the two given years have the largest combined cost of flood damage?
 a. '91 + '93 b. '86 + '95 c. '84 + '90 d. '87 + '89
8. If Andhra Pradesh and West Bengal account for 40% and 30% of the total cost, in how many years has their combined contribution been greater than the total cost of the previous year on the basis of the given graph? (Use above data for other questions if required.)
 a. 0 b. 1 c. 2 d. None of these
9. For how many years has the share of Andhra Pradesh been lesser than that of West Bengal for the next year?
 a. 0 b. 1 c. 2 d. None of these
10. If in the year, when the cost towards flood damage was the least, Karnataka and Kerala accounted for 45% and 20% of the remaining cost (after A.P. and W.B.) respectively, what was the difference in the costs towards flood control of Karnataka and Kerala? (in Rs crore)
 a. 108 b. 115 c. 120 d. None of these
11. In the year when the cost of flood control was the highest, 32% of the cost was because of a cyclone that hit the south-eastern coast of the country. The cyclone relief was equally divided among Tamil Nadu and Andhra Pradesh. How much did Andhra Pradesh get as cyclone relief? (in Rs crore)
 a. 608 b. 632 c. 651 d. 676
12. In '88 if 5 states were given the entire cost in the ratio 3 : 21/2 : 2 : 11/2 : 1, with Tamil Nadu getting the second lowest contribution in that year; how much did Tamil Nadu actually get in '88? (in Rs crore)
 a. 300.8 b. 312.4 c. 340.6 d. None of these
13. What is the average amount spent on flood damage during the mentioned years in the nineties? (in Rs crore)
 a. 2125 b. 2250 c. 2350 d. 2450
14. In '91, 18% of India's population of 840 million were provided with relief material by utilising the entire cost for flood damages that year. What was the approximate value of the relief material given to each affected person in '91? (Assume uniform distribution)
 a. Rs 16.5 b. Rs 20.5 c. Rs 23.5 d. None of these

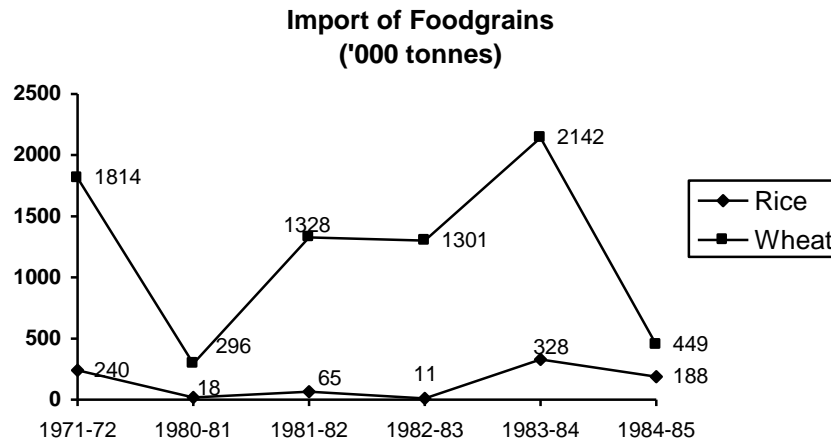


Directions for Questions 15 to 23: The following bar graph shows the percentage contribution of various items to the profits of a cosmetics company in 1996 and 1997; the profits have been mentioned in brackets next to the corresponding year.



15. What was the total contribution of soaps to the profits of the company in the two-year period?
a. Rs 30 lakh b. Rs 34 lakh c. Rs 38 lakh d. Rs 41 lakh
16. What was the additional contribution (in Rs. lakh) by hair oil in 1997 to the profits of the company, compared to its contribution in the previous year?
a. 0 b. 3.4 c. 33 d. 2.9
17. In the year 1996, how much more (in Rs lakh) did detergents contribute to the profits of the company than hair oil and face powder together?
a. 1.68 b. 2.52 c. 11.2 d. 4.25
18. What was the percentage decline in the sales (in Rs lakh) of the company's toothpaste between 1996 and 1997?
a. 13 b. 21 c. 40 d. Indeterminable.
19. The number of items which contributed higher amounts to the profit of the company in 1997 than in 1996 was...
a. 3 b. 4 c. 5 d. 6
20. The ratio between the percentage increase of the profits of soaps and the percentage increase of the total profits of the company from 1996 to 1997 was approximately...
a. 2.25 : 1 b. 3.1 : 1 c. 1.8 : 1 d. 1.4 : 1
21. If the expenditure on advertisement on hair oil and face powder in 1997 formed 4% and 5% of the profit earned by them respectively, what was the amount (in Rs lakh) spent on these advertisements?
a. 1.15 b. 2.64 c. 11.5 d. 26.4
22. If the profit margin on the sale of detergent was 18% in 1997, what was the sales turnover of detergents (in Rs lakh) in that year?
a. 148 b. 168 c. 198 d. 220
23. If the tax on profits was 42% in 1996 and 48% in 1997, how much additional tax (in Rs lakh) was payable in 1997 than in 1996?
a. 6.6 b. 14.7 c. 18.5 d. 21.5

Directions: Questions 24 to 30 are based on the following graph.



The total values of imports during these years are given below:

1971-72: Rs.123 crore

1980-81: Rs. 80 crore

1981-82: Rs.314 crore

1982-83: Rs.295 crore

1983-84: Rs.587 crore

1984-85: Rs.158 crore

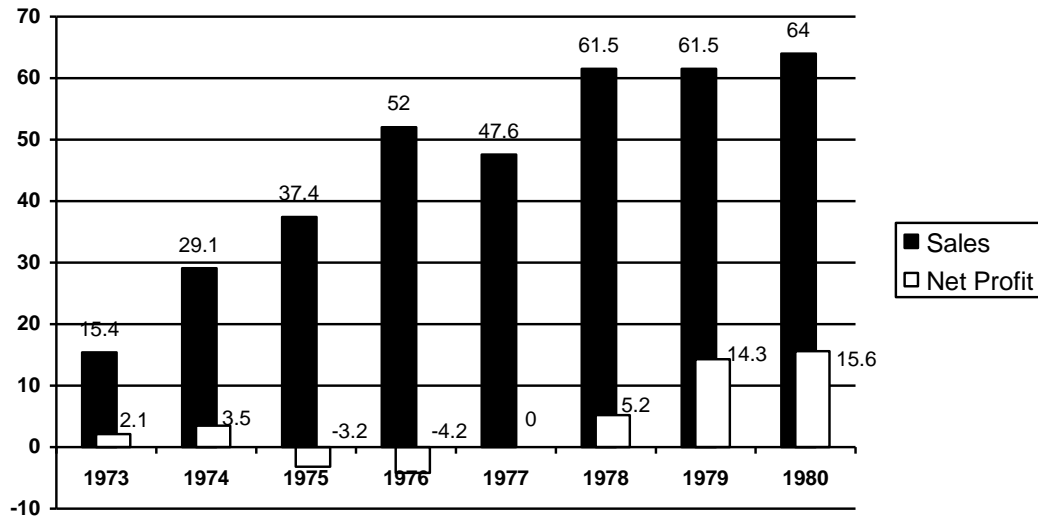
24. Wheat formed what percent of total imports of foodgrains from 1980-85 (in terms of tonnes)?
a. 75% b. 66% c. 90% d. 95%
25. What was the excess of import of wheat over that of rice during 1982-85? (in million tonnes)
a. 34 b. 3.4 c. 0.34 d. 340
26. The foodgrains imported during 1984-85 formed what percentage of the import during 1971-72?
a. 3% b. 31% c. 41% d. 4.1%
27. If the import price of wheat was Rs.2400 per tonne in 1983-84, what was the import price of rice per tonne during that year?
a. 3200 b. 2225 c. 2850 d. Indeterminable
28. What was the total cost of import of foodgrains from 1980-85 (in Rs crore)?
a. 1635 b. 1354 c. 1434 d. 1558
29. The import of rice in 1983-85 formed what percentage of the import of wheat during this period (in terms of weight)?
a. 20% b. 25% c. 18% d. 35%
30. If wheat had cost Rs.2000 per tonne in 1980-81, what was the amount of money spent on import of rice during that year?
a. Rs 2 crore b. Rs 21 crore c. Rs 14 crore d. Rs 30 crore



Exercise - 7(A)

Directions: Questions 1 to 8 are to be answered on the basis of information available in the following bar graph.

Sales and Net Profits of a Company (in Rs lakhs)



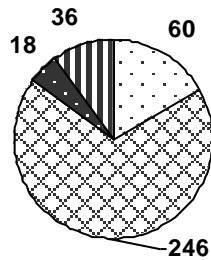
- Which was the year in which the sales revenue registered the highest percentage growth compared to that of the previous year?
a. 1974 b. 1976 c. 1978 d. 1980
- What was the cumulative net profit of the first five years for which particulars are shown?
a. 2.2 lakh b. -1.2 lakh c. -1.8 lakh d. 3.2 lakh
- Which was the year in which the expenses of the company was the highest?
a. 1980 b. 1979 c. 1978 d. 1976
- The trends of growth of sales revenue and net profit were the same for which of the two years?
a. 1974-75 b. 1975-76 c. 1976-77 d. 1978-79
- If a tax of 55% was paid on gross profit before the net profit was arrived at, what was the combined gross profit (in Rs. lakh) for the years 1979 and 1980?
a. 67 b. 62 c. 46 d. 38
- If the net profit in 1981 was 18% more than in 1980, and this was 20% of the sales turnover in that year, the sales turnover in 1981 was
a. 78 lakh b. 84 lakh c. 102 lakh d. 91 lakh
- If, in the year 1980, the expenditure on advertisement was 2.5% of the sales turnover, what was its percentage on the net profit for that year?
a. 11.8% b. 10.2% c. 13.5% d. 9.4%

Directions : For questions 8 to 15, refer to the following graphs.

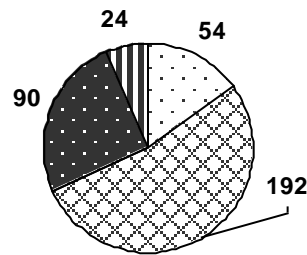
IMPORTS OF MAJOR COMMODITY GROUPS

(All the values shown are angular measurements in degrees)

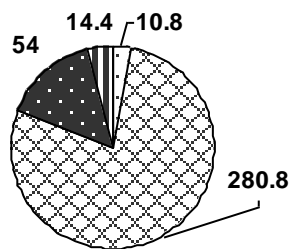
Rs. 1795 crore (1960-61)



Rs. 1634 crore (1970-71)



Rs. 12549 crore (1980-81)



8. The import of consumer goods in 1960-61 cost how many crore?
a. 245 b. 435 c. 298 d. 570
9. What is the difference in the percentage of import of raw materials to the total from 1970-71 to 1980-81?
a. 10 b. 15 c. 20 d. None of these
10. By how many crore did the import of raw materials in 1970-71 exceed import of consumer goods in 1960-61?
a. 510 b. 570 c. 630 d. 680
11. The value of import of capital goods during 1980-81 exceeded the value of the total imports in 1960-61 by how many crore?
a. 85 b. 100 c. 115 d. 140
12. The value of import of consumer goods in 1980-81 showed what variation from the value of the import of consumer goods in 1960-61?
a. decreased by Rs 95 crore b. decreased by Rs 60 crore
c. increased by Rs 95 crore d. increased by Rs 75 crore
13. From the 100000 tonnes of raw materials imported in 1970-71, nickel accounted for 200 tonnes. What was the price of Nickel in terms of Rs per ton?
a. 850 b. 8500 c. 85000 d. Indeterminable
14. If textile machinery accounted for 14% of the capital goods in 1970-71 in which 210 textile units of the same kind were purchased, what is the price of each unit of textile machinery? (in Rs million)
a. 1.2 b. 1.8 c. 2.7 d. None of these
15. If India's balance of trade was -1800 crore in 1980-81 and iron ore accounts for 30% of the exports, what is the revenue generated by the export of iron ore in 1980-81? (in Rs crore)
a. 3225 b. 3325 c. 3425 d. 3525



Directions: Questions 16 to 20 are based on the following data:

BENETT COLEMAN & CO
(Circulation in lacs)

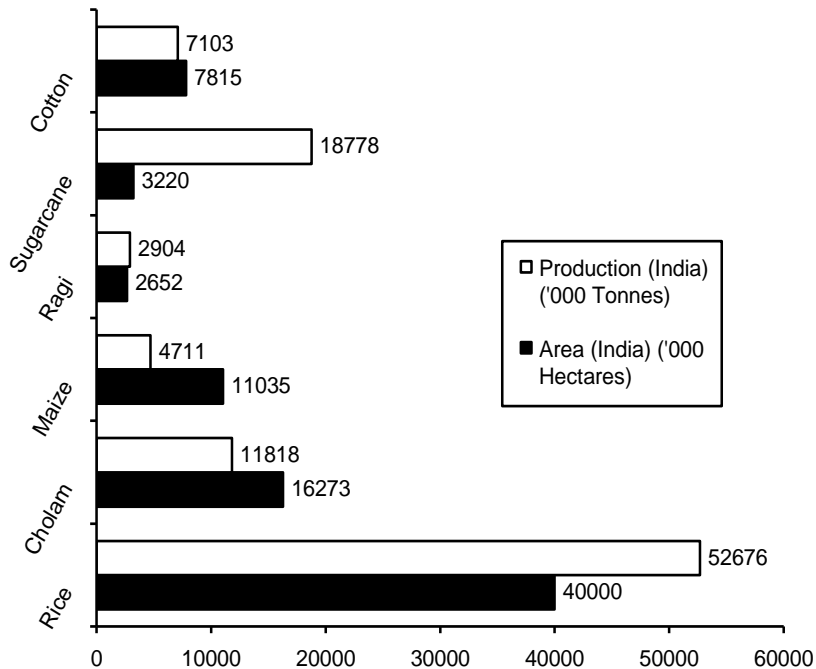
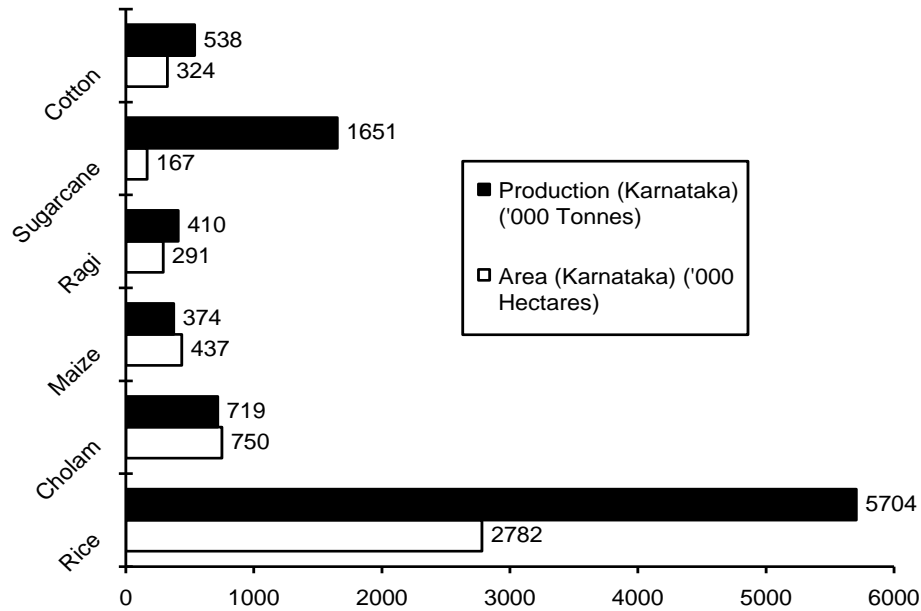
Year	1990	1995	1999	2000	2001
Economic Times (daily)	2.42	3.75	6.23	7.12	8.85
Times Of India (daily)	11.72	16.43	25.22	29.63	33.19
Maharashtra Times (daily)	2.54	2.44	1.87	1.66	1.54
Sunday Times (weekly)	14.25	21.43	31.2	35.62	41.23
Navbharat (daily)	4.65	6.79	5.45	5.21	4.21

16. If the company charges 0.05 Rs per sq cm of advertisement per reader for Sunday Times, and in 2001, on Sundays, average advertisement space booked was 200 sq cm, what is the total advertisement revenue from Sunday times for the year 2001 (in Rs Crore)?
a. 150 b. 200 c. 22 d. 210
17. What is the simple annual growth rate in the number of circulation of all newspapers for the period 1990-2001?
a. 13.5% b. 15% c. 10% d. 20%
18. If all the newspapers except Sunday times are priced at Rs 2 and Sunday Times is priced at Rs 5, what is the total sales revenue for the year 2001?
a. 600 cr b. 500 cr c. 450 cr d. 1000 cr
19. In 2001, Economic Times commanded 73% market share in the category of business newspapers, but its market share came down to 60% in 2002. Assuming that the total market size increased by 15% in this period, what is the circulation of Economic Times in 2002?
a. 9.4 lacs b. 10 lacs c. 8.45 lacs d. 8.85 lacs
20. Which newspaper from the company has shown the highest growth rate in the given period?
a. Economic Times b. Times Of India c. Sunday Times d. Navbharat

Exercise - 7(B)

Directions: Questions 1 to 8 are to be answered on the basis of information available in the following bar graphs.

KARNATAKA AND INDIA : 1977-78



- What is the difference (in kg) between the yield per hectare in India and Karnataka for maize?
a. 384 b. 427 c. 463 d. None of these
- The yield per hectare of cotton in Karnataka forms what percent of that in India?
a. 157% b. 182% c. 204% d. None of these
- The production of which crop in Karnataka forms the maximum percent of the national yield?
a. Cotton b. Ragi c. Rice d. Sugarcane

4. The number of crops yielding more than 1.5 tonnes per hectare both in India and Karnataka is.....

a. 0 b. 1 c. 2 d. 3
5. Of the area in India where Cholan was grown, 11 million hectares were irrigated and the production in this irrigated area was 90 lakh tonnes. What is the production of Cholan per hectare of unirrigated area in India?

a. 485 kg b. 535 kg c. 575 kg d. None of these
6. With the production of 1970-71 as index 100, the corresponding index of production of Ragi in 1977-78 in Karnataka is 132, and that of India is 155. The production of Ragi in Karnataka in 1970-71 formed what percent of India's production of Ragi then?

a. 14.8% b. 16.6% c. 18.2% d. Insufficient data
7. Due to a drought in Karnataka, 10% of the land becomes unavailable for the next year, but the production of all the crops remains the same. What is the new yield per hectare of sugarcane?

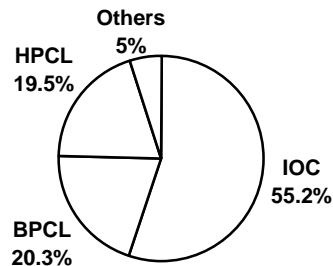
a. 11.0 tonnes b. 12.2 tonnes c. 10.1 tonnes d. Indeterminable
8. If the selling price of sugarcane is Rs 400 per quintal while the entire average expenditure of the land and farming of sugarcane comes to around Rs 30000 per hectare, what is the profit made by the Karnataka farmers, if the entire produce is sold?

a. 143.5 crore b. 159.4 crore c. 173.2 crore d. Indeterminable

Directions: Answer questions 9 to 15 with the help of the following pie - chart.

Market-share of Petroleum Products

(Rs.12000 crore)

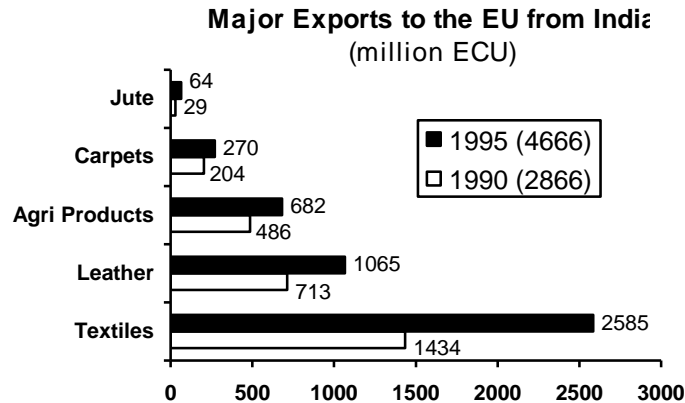


9. The market shares of BPCL and HPCL form what percent of the market share of IOC?
a. 65 b. 72 c. 81 d. None of these
10. If IOC's revenue in the North is the same as HPCL's revenue in India, what is IOC's revenue from the remaining parts of India? (in Rs crore)
a. 4280 b. 4470 c. 5250 d. 4870
11. If HPCL's revenue from diesel and petrol is exactly the same from all the four regions in India, what is the revenue obtained by sales of petrol in South India? (in Rs crore)
a. 150 b. 225 c. 300 d. Indeterminable
12. If petrol forms 60% of BPCL's revenue, and if both the total revenue and the revenue from the sale of petrol are equally divided among the four regions in India, what is the revenue obtained from the Eastern region from the sale of petroleum items other than petrol? (in Rs crore)
a. 224 b. 234 c. 244 d. None of these

IOC's break-up of the revenue is :- 50% Petrol, 30% Diesel, 15% Engine Oil and the remaining is Grease. This break-up is the same for all the four regions of India.

13. What is the difference in the quantities of the sale of petrol and diesel in the entire country for IOC?
a. 660 b. 1320 c. 2000 d. Indeterminable
14. What percent of the market share of 'Others' does the revenue by sale of IOC's grease form?
a. 180% b. 100% c. 80% d. 55%
15. The revenue obtained by IOC's diesel forms what percent of the total revenue of BPCL?
a. 61% b. 71% c. 81% d. 91%

Directions: Questions 16 to 23 are based on the following bar graph and the adjoining table.



India's Market Share in the EU (%)		
Product	1990	1995
Textiles	4.37	5.94
Leather	11.01	13.03
Agri. Products	1.30	1.45
Carpets	19.90	23.26
Jute	17.16	40.76
Total	0.98	1.43

16. What was the annual percentage increase in India's total exports to the EU from 1990 to 1995?
a. 10% b. 12.5% c. 30.5% d. 62%
17. What was the percentage increase in the combined exports of carpets and leather from India in 1995 over 1990?
a. 35% b. 40% c. 45% d. 50%
18. What is the difference in the percentage share of the exports of textiles to the total exports to the EU from 1990 to 1995?
a. increase of 5 b. decrease of 5 c. increase of 5% d. decrease of 5%
19. What was the approximate size of the EU market (in billion ECU) in 1995?
a. 3.25 b. 32.5 c. 325 d. None of these
20. What was the size of the leather market in the EU (in billion ECU) in 1990?
a. 5.5 b. 6.5 c. 55 d. 65
21. What was the percentage increase in the size of the EU market from 1990 to 1995?
a. 12 b. 22 c. 32 d. None of these
22. Which of the following products showed the maximum percentage increase in export during the given period?
a. Jute b. Agricultural products c. Leather d. Textiles



23. If India must increase its EU market share to 3%, while the EU market size must increase by 10%, what must be India's export (With respect to 1995, in billion ECU) to the EU?
 a. 10.75 b. 107.5 c. 1075 d. None of these

Directions : Questions 24 to 30 are to be answered on the basis of information available in the following tables.

SIZE DISTRIBUTION OF OPERATIONAL HOLDINGS

(Total Area remains the same at 160 million hectares)

1979 - 80

Size (1000 hectares)	< 0.5	0.5 - 2	2 - 3	3 - 5	5 - 10	10 - 20	20 - 50	> 50	Total
No. of Holdings	23696	25936	6722	6643	5248	2135	566	65	71011
% of Area	3.3	17.5	10	15.8	22.4	17.6	9.7	3.7	100

1984 - 85

Size (1000 hectares)	< 0.5	0.5 - 2	2 - 3	3 - 5	5 - 10	10 - 20	20 - 50	> 50	Total
No. of Holdings	30050	29201	7497	7000	5381	1943	450	47	81569
% of Area	4.3	19.2	11.1	16.5	22.7	15.9	6.5	2.8	100

1989 - 90

The total number of holdings is 90000.

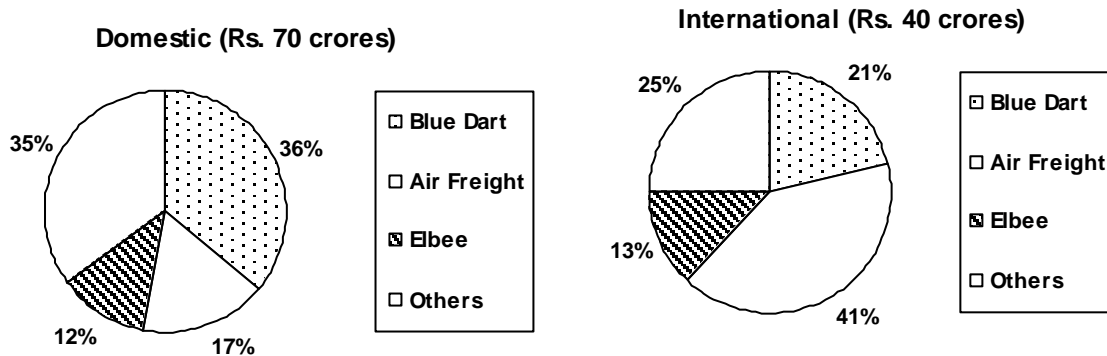
Size (1000 hectares)	< 0.5	0.5 - 2	2 - 3	3 - 5	5 - 10	10 - 20	20 - 50	> 50	Total
% of Holdings	40	33	9	8	7	2	0.9	0.1	100
Area (1000 hectares)	7800	32700	16150	25400	34050	26700	13200	4000	160000

24. The increase in the number of holdings of size 500 to 3000 hectares formed what percent of the increase in the total number of holdings between 79-80 and 84-85?
 a. 33.2% b. 38.3% c. 44.1% d. None of these
25. Between 79-80 and 84-85, what is the change in area under the ">20000 hectares" category (in hectares)?
 a. 6.56 million b. 8.38 million c. 36.77 lakh d. 48.61 lakh
26. In 84-85 what was the average area of holdings (in hectares) of those which held not more than 2000 hectare area?
 a. 65 b. 123.1 c. 635 d. Indeterminable
27. In 89-90, what was the average size of holdings (in thousand hectares) of those between 3000 and 10000 hectare category?
 a. 4.4 b. 8.8 c. 6.2 d. 3.1
28. The total area of land held by those with more than 2000 hectares has changed by how many thousand hectares between 79-80 and 89-90?
 a. 4.24 b. 4240 c. 6.12 d. 6120
29. The number of holdings of less than or equal to 2000 hectares has increased by how many times between 79-80 and 89-90?
 a. 3.2 b. 0.32 c. 0.46 d. 0.64
30. The percentage change in the number of holdings in 3000 to 5000 hectares category from 79-80 to 84-85 forms what percent of the percent change in the number of holdings of the same category from 79-80 to 89-90?
 a. 43 b. 53 c. 63 d. 73

Exercise - 8(A)

Directions: Questions 1 to 7 are to be answered on the basis of information available in the following Pie chart.

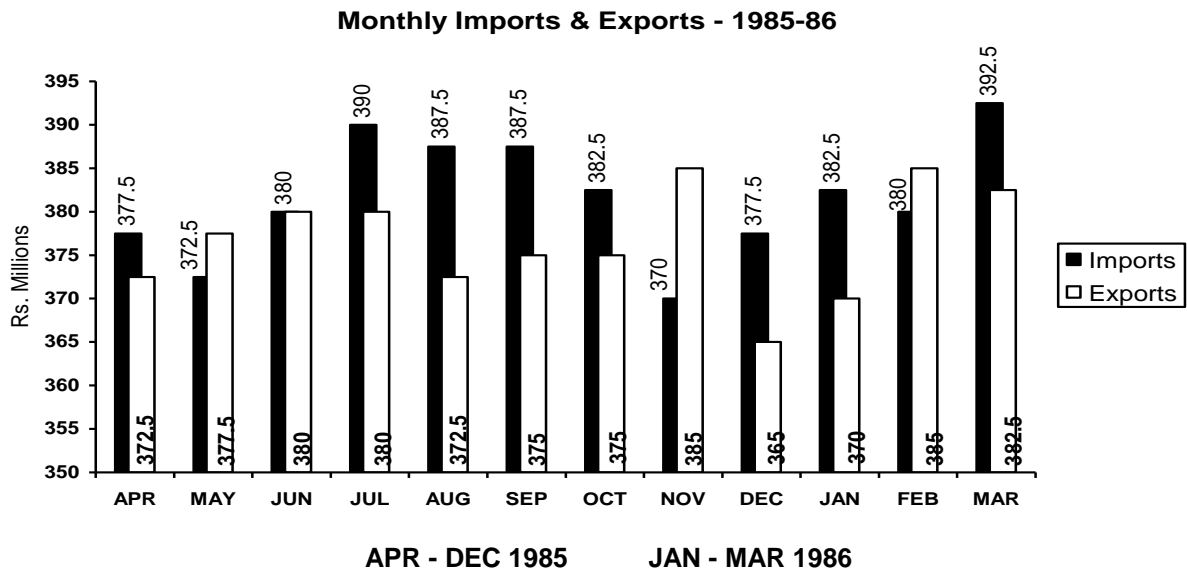
Percentage share of major cargo carriers in India in 1996



1. What was Airfreight's turnover (in Rs crore) in 1996?
 a. 20.8 b. 24.6 c. 28.3 d. 32.1
2. What was the difference (in Rs crore) in Blue Dart's domestic turnover and the international turnover of others?
 a. 15.2 b. 20.2 c. 25.2 d. 35.2
3. If 35% of Blue Dart's international cargo revenue comes from documents, what percent of Blue Dart's total revenue is contributed by these documents?
 a. 2.25 b. 3.75 c. 5.5 d. None of these
4. If Skypak accounts for 8% of the domestic cargo, what percent of the Others category does it account for (in the domestic cargo sectors)?
 a. 18% b. 20.5% c. 23% d. 25.5%
5. In the next year, if Elbee and Airfreight decide to merge and have the same percentage share as Blue Dart, what will be their combined share of the Rs 80 crore domestic market, if the share in Rs Crores of Others remains the same as the previous year? (in Rs crore)
 a. 25.8 b. 27.75 c. 28.5 d. 30.5
6. In the next year, for the international market, if Blue Dart ties up with Skypak to gain a 1% market share over Airfreight, who maintain the same percentage share as the previous year. If Blue Dart and Skypak's shares are in the ratio 2 : 1, what is Skypak's international revenue? (in Rs crore)
 a. 5.6 b. 11.2 c. 16.8 d. Indeterminable
7. If in 1999, DHL enters the local market and is able to capture 30% of the Rs 150 crore market and the other 4 manage equal shares of the remaining market, what is Elbee's revenue in 1999? (in Rs crore)
 a. 24.25 b. 25.25 c. 26.25 d. 27.25

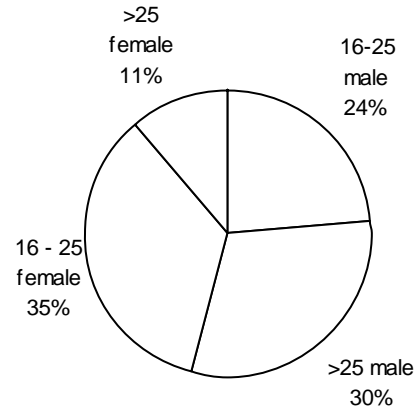


Directions: Questions 8 to 15 are based on the following bar graph.



8. What was the total value of exports (in Rs million) during the period April-Sept., 1985?
a. Rs 1885 b. Rs 2632 c. Rs 2257.5 d. Rs 2325
9. The gap between monthly import and export was greatest in
a. Aug & Sept b. Sept & Dec c. Dec & Jan d. Aug & Nov
10. In the first three months of 1986, imports exceeded exports by
a. Rs 27.5 m b. Rs 20 m c. Rs 17.5 m d. Rs 32.5 m
11. During the financial year 1985-86,
a. Imports exceeded exports by Rs. 100 million.
b. Imports exceeded exports by Rs. 60 million.
c. Exports exceeded imports by Rs. 250 million.
d. Exports and imports were of equal value.
12. In how many months did the import exceed export?
a. 8 b. 3 c. 7 d. 5
13. For the month when exports and imports were of equal value, the import bill was
a. Rs 760 million b. Rs 377.5 million c. Rs 380 million d. Rs 387.5 million
14. The three-month period during which import was greatest was
a. Jan-Mar b. Aug-Oct c. Jul-Sept d. May-Jul
15. In which quarter of the financial year was the difference between import and export values the least?
a. First b. Second c. Third d. Fourth

Directions: Questions 16 to 20 are based on the following data.



Year – 2000: Total Market = 2672 crores; Total consumers = 200 millions

16. If in the year 2001, category 16-25 (females) grows by 20% and the category >25 (males) grow by 30% and the remaining categories grow by 15%, what would be the total number of consumers in the year 2001?
 a. 263.5 mn b. 235 mn c. 242.5 mn d. 250 mn
17. In beer category, Kingfisher is the market leader with a market share of 30%, and in Rum, Bacardi enjoys the leadership with a market share of 24%. What is the difference in the sales of these two brands?
 a. 400 cr b. 200 cr c. 300 cr d. 250 cr
18. In the year 2001, the Government lifts the ban on drinking for those aged less than 16 years, resulting in an increase of 20% in the total consumers, what is the number of people (in millions) less than 16 years of age consuming any of the drinks?
 a. 5 b. 50 c. 10 d. Indeterminable
19. If the sales industry grows at a rate of 10% annually for the first 4 years, and in the year 2005 it grows by 20%, what would be the total sales in the year 2005?
 a. 4200 cr b. 4500 cr c. 4700 cr d. 500 cr
20. Volume of sales generated by Brandy, Gin and Vodka was what percent of the volume of sales generated by beer?
 a. 45% b. 62% c. 40% d. 35%



Exercise - 8(B)

Directions: Questions 1 to 5 are based on the following data.

Eedhar – Ka – Maal – Oodhar Enterprises and Oodhar – Ka – Maal – Eedhar Enterprises are rivals operating in the same market segment. These organisations adopt various strategies, X, Y or Z, in order to outdo each other. The following table gives the respective payoffs and the respective expenses involved on account of following a particular strategy. For example, if Oodhar – Ka – Maal – Eedhar Enterprises adopts strategy X and Eedhar – Ka – Maal – Oodhar Enterprises adopts strategy Y, then Oodhar – Ka – Maal – Eedhar Enterprises gains Rs. 16000 while Eedhar – Ka – Maal – Oodhar Enterprises loses Rs. 16000. In addition to this, Eedhar – Ka – Maal – Oodhar Enterprises and Oodhar – Ka – Maal – Eedhar Enterprises also have to incur the expenses for the strategy adopted.

Payoffs for Oodhar – Ka – Maal – Eedhar Enterprises				
Oodhar – Ka – Maal – Eedhar Enterprises		Eedhar – Ka – Maal – Oodhar Enterprises		
	Strategy	X	Y	Z
	X	-4000	16000	12500
	Y	10000	-6000	9000
	Z	16000	15000	-4000
Expenses				
Strategy	X	Y	Z	
Eedhar – Ka – Maal – Oodhar Enterprises	8500	6000	5500	
Oodhar – Ka – Maal – Eedhar Enterprises	7000	9000	6500	

- If Eedhar – Ka – Maal – Oodhar Enterprises adopts strategy X, which strategy should Oodhar – Ka – Maal – Eedhar Enterprises adopt for maximum gains?
a. X b. Y c. Z d. Indeterminable
- If Eedhar – Ka – Maal – Oodhar Enterprises adopts strategy Y, what is the maximum gain of Oodhar – Ka – Maal – Eedhar Enterprises?
a. 8500 b. 9000 c. 15000 d. 16000
- If Oodhar – Ka – Maal – Eedhar Enterprises adopts strategy Z, what strategy should Eedhar – Ka – Maal – Oodhar Enterprises adopt in order to minimise Oodhar – Ka – Maal – Eedhar Enterprises' gain, regardless of what its own gain will be?
a. X b. Y c. Z d. Indeterminable
- If Eedhar – Ka – Maal – Oodhar Enterprises adopts strategy Y, which strategy should Oodhar – Ka – Maal – Eedhar Enterprises adopt for maximum gains?
a. X b. Y c. Z d. Indeterminable
- If Oodhar – Ka – Maal – Eedhar Enterprises adopts strategy Z, which strategy should Eedhar – Ka – Maal – Oodhar Enterprises adopt in order to minimise its losses?
a. X b. Y c. Z d. Indeterminable

Directions: Answer questions 6 to 13 with the help of the following table.

SHARE OF INKJET PRINTERS

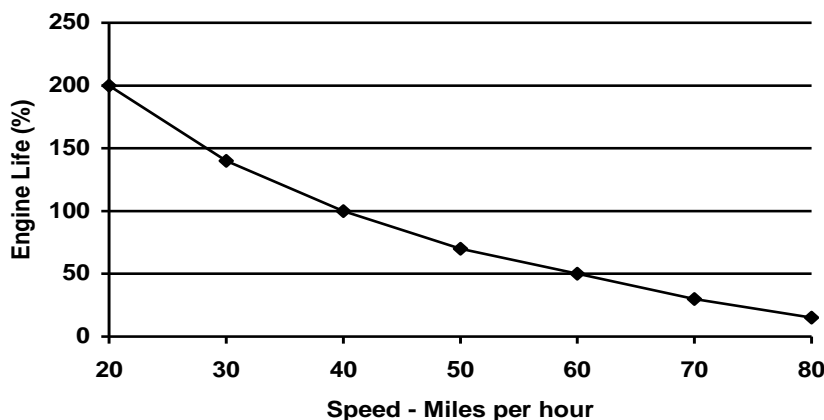
Company	Volume of sales
HP	60404
Epson	07223
Wipro	06954
Canon	03715
Modi Xerox	02653
Lexmark	01087
Apple	00277
Tektronix	00021
Others	02067
Total	84401

6. What is Wipro's percentage share of the inkjet printers market?
a. 7.6% b. 7.9% c. 8.2% d. 8.5%
7. What percentage of the market is the difference in the shares of Modi Xerox and Lexmark combined and the combined shares of Canon and Apple?
a. 3.2 b. 2.2 c. 1.2 d. None of these
8. The ratio of the percentage share of Epson to that of Others is
a. 4.5 b. 4.0 c. 3.6 d. 3.25
9. If TVS has a 30% share of the Others share, what is the difference in the number of pieces sold by TVS and Apple?
a. 333 b. 343 c. 353 d. 363
10. If 40% of HP's printers are made at their UP plants and the remaining are made at their AP plants, what is the number of HP printers not made at Lucknow?
a. 40320 b. 36240 c. 24040 d. Indeterminable
11. If in the next year, Canon and Epson decide to join hands and increase their market share from their combined existing share by 20%, what will be their combined production if the market size remains the same?
a. 13125 b. 14260 c. 15890 d. Indeterminable
12. If the production of HP inkjet printers for the year 1990 is assigned an index of 100, then the index of production of HP in the above mentioned data is 252. If their market share then was 75%, what was the total volume of sales of the printer market in 1990?
a. 30156 b. 31960 c. 32896 d. 33764
13. What is the difference in the percentages of HP's share of the total printers and of Epson's share of the remaining printers?
a. 36.5 b. 41.5 c. 46.5 d. 51.5
14. If the ratio of share of Tektronix to Lexmark remains the same in 1990, what will be the combined index for their share?
a. 55 b. 42 c. 65 d. Insufficient data



Directions: Questions 15 to 22 are to be answered on the basis of information available in the following graph.

Life Expectancy of a Motor Car Engine



15. At what speed (in mph) is the engine considered to have its normal length of life?
a. 20 b. 30 c. 40 d. 50
16. The life of an engine driven at 20 miles per hour is how many times more than the life of an engine driven at 40 miles per hour?
a. 1 b. 1.5 c. 2 d. 1.75
17. At what speed (in mph) is the life of an engine only half its normal life?
a. 20 b. 30 c. 50 d. 60
18. If an engine, usually driven at a speed of 60 mph, had a lifespan of 30,000 miles, what will be the lifespan of an engine which is usually driven at a speed of 30 mph?
a. 15,000 miles b. 60,000 miles c. 84,000 miles d. 120,000 miles
19. Given that the normal lifespan of an engine is 60,000 miles, what was the lifespan of an engine which was driven for 20,000 miles at a speed of 60 miles per hour and later at a speed of 30 miles per hour?
a. 40,000 miles b. 28,000 miles c. 48,000 miles d. 50,000 miles
20. If the engine is bored when it has completed 75% of its life span, its lifespan is extended by 50% of its normal lifespan. If the normal lifespan of a engine is 60,000 miles and it is being run at a usual speed of 50 miles/hour and bored in time, how many more miles can it be run at the same speed after boring?
a. 63,000 miles b. 23,000 miles c. 31,500 miles d. 20,000 miles
21. Between running an engine at 50 miles per hour and 30 miles per hour, the life span increases by what percent?
a. 70% b. 100% c. 60% d. 200%
22. It noticed that driving on the highway increases the life expectancy of the engine, during that period by 10%. If on an average, every third mile that a car covers is on a highway, what is the expected life of the engine, if it is driven throughout at 30 mph?
a. 144.66 % b. 149.5 % c. 154 % d. Indeterminable

Directions: For questions 23 to 30, refer to the following table.

City	Price of office property (Rs.)
Amsterdam	10296
Bangalore	16452
Bangkok	8352
Beijing	27540
Chicago	14328
Frankfurt	17172
Hong Kong	47664
London	42012
Mumbai	60876
New Delhi	35496
New York	23796
Paris	24372
Singapore	31968
Tokyo	44532

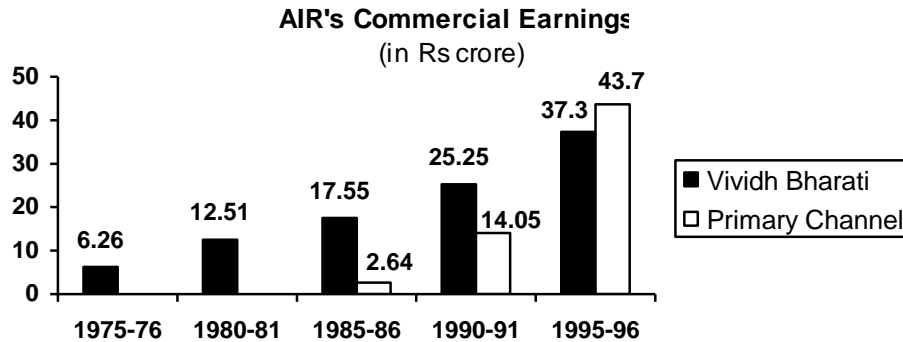
The property price is the total occupational cost per square metre in Rupees. The exchange rate of the Rupee is 1 U.S. \$ = Rs 36.

23. The cost of office property in Mumbai is how many times the average cost of the two other Indian cities mentioned (New Delhi and Bangalore)?
a. 0.8 b. 1.4 c. 1.8 d. 2.4
24. What is the percentage difference in the price of office property in Hong Kong than that of Chicago?
a. 154% b. 178% c. 202% d. 233%
25. If Rustumjee bought 150 sq m of office property at Paris to sell perfumes, how much did he have to pay? (in thousand US \$)
a. 101500 b. 123500 c. 131600 d. None of these
26. If Honda wants to buy office space measuring 8000 sq m in Tokyo, and is given a 10% discount on the price because of nepotism, how much did Honda pay for the property? (in thousand rupees)
a. 320630 b. 356240 c. 375760 d. None of these
27. SMP International sold their Singapore office, measuring 2000 sq m and bought office property with the same amount at Amsterdam. What was the area in sq m, of the Amsterdam office? (Assume the cost price and selling price rates to be the same)
a. 645 b. 6200 c. 9300 d. Indeterminable
28. Wagh Builders and Developers set up an office at Beijing by paying US \$ 1.5 million. What was the approximate area of the office, in sq m?
a. 195 b. 240 c. 280 d. None of these.
29. If Dharma & Daughters suffer a major loss and have to sell their New Delhi office to wipe out their US\$ 234570 loss, what was the approximate area of their office, in sq m, in New Delhi? (Assume the cost price and selling price rates to be the same)
a. 160 b. 240 c. 320 d. 400
30. If Mercedes decides to buy 4000 sq m of office space at Frankfurt, how much should they pay (in thousand Deutsche Mark) for the space? (4DM = 3US\$).
a. 1544 b. 1844 c. 2244 d. 2544



Exercise - 9(A)

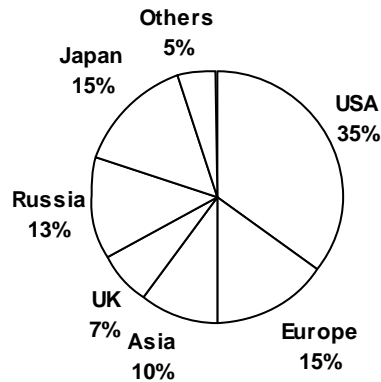
Directions: For questions 1 to 8, refer to the following bar graph.



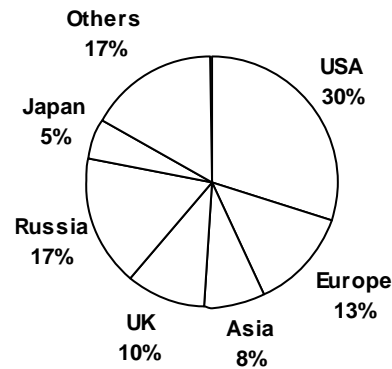
- By how many times has AIR's commercial earnings increased over the given period?
a. 10.9 b. 11.9 c. 12.9 d. 13.9
- What was the annual percentage increase of AIR's commercial earnings from 1985-86 to 1995-96?
a. 25% b. 27.5% c. 30% d. 32.5%
- What is the deviation in Vividh Bharati's percentage increase in revenue from 1985-86 to 1995-96 to its percentage increase in revenue from 1975-76 to 1985-86?
a. 60 b. 67 c. -69 d. None of these
- What was the annual percentage increase in the increase in the revenue of the primary channel since its inception?
a. 20.5% b. 205% c. 2050% d. Indeterminable
- If the FM channel contributed Rs 10 crore in 1995-96, what is the percentage of the remaining earnings to that of the earnings of 1980-81?
a. 460 b. 510 c. 610 d. None of these
- The percentage increase in the revenue of Vividh Bharati from 1990-91 to 1995-96 formed what percent of a similar increase in the revenue of the primary channel?
a. 24% b. 34% c. 240% d. 340%
- If AIR's commercial earnings for the next year 1996-97 is projected as Rs.100 crore, what will be the annual percentage increase over 1990-91?
a. 6% b. 26% c. 60% d. None of these
- If private broadcasters earn 18% of AIR's commercial earnings and Times FM accounts for 60% of the earnings of private broadcasters, what was the earnings of the other private broadcasters (other than Times FM) in 1995-96? (in Rs crore)
a. 4.6 b. 5.2 c. 5.8 d. None of these

Directions: Questions 9 to 13 are based on the following data:

2000-01 Imports into India:
52045 million \$



2000-01 Exports from India:
42687 million \$



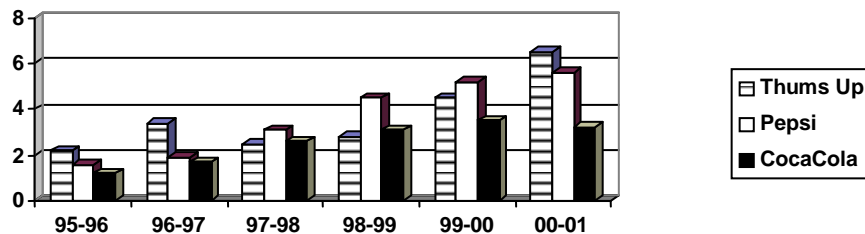
Trade surplus = Exports - Imports

Trade Deficit = Imports - Exports

9. What was the trade deficit with Japan for the year 2000-01?
a. \$ 7 bn b. \$ 10 bn c. \$ 12 bn d. \$ 5 bn
10. If 70% of exports to USA are from software. What is the revenue from software exports to USA in the year 2000-01?
a. \$ 8.9 bn b. \$ 10.9 bn c. \$ 6.9 bn d. \$ 12.9 bn
11. Exports to Europe was what percent of imports from Europe?
a. 100% b. 50% c. 70% d. 85%
12. If Rouble falls by 50% in the year 2001-02, what should be the exports to Russia in \$ so that the exports figure remains same?
a. \$ 6.5 bn b. \$ 13 bn c. \$ 3.25 bn d. Indeterminable
13. If in the year 2001-02, imports from USA increase by 20%, by what percent should the exports increase so that there is no trade deficit with USA?
a. 100% b. 50% c. 70% d. 85%
14. If the imports from Germany form 35% of that from Europe, what percent of the total exports to Europe, should the exports to Germany be, so that the imports from Germany equal exports to Germany?
a. 69% b. 59% c. 49% d. Indeterminable

Directions: Questions 15 to 20 are based on the following data:

The chart given below shows the sales of three brands of colas in million cases.



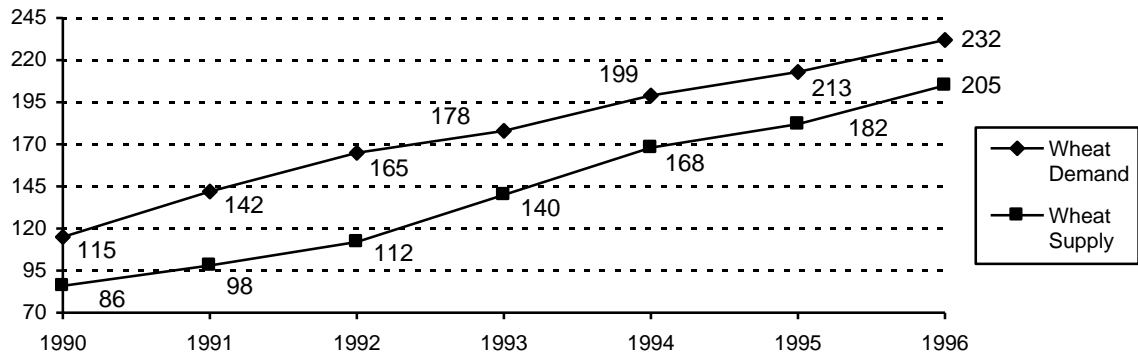
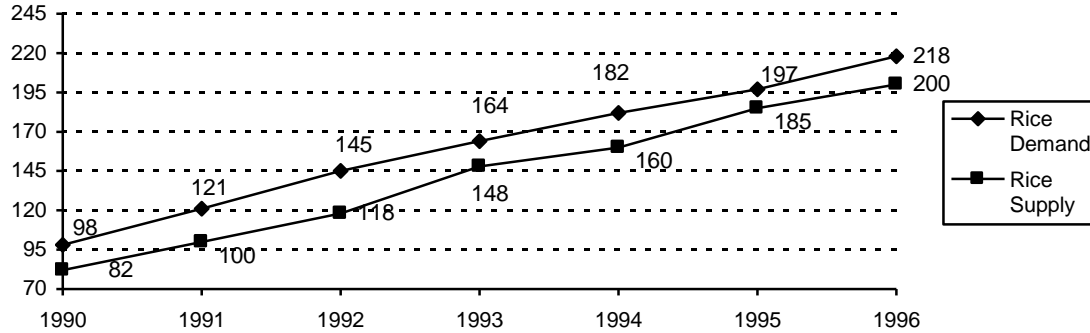


15. Considering each case contains 24 bottles ,and avg selling price per bottle is Rs 9 and these three brands together command a market share of 80% , what is the total industry size in the year 2000-01?
a. Rs 300 cr b. Rs 400 cr c. Rs 450 cr d. Rs 500 cr
16. Which brand had the highest sales figure in the given period of 1995 to 2001?
a. Coca Cola b. Thums Up c. Pepsi d. Both a & c
17. In the given period, which brand and for which year did that brand show the highest percenatge growth?
a. Thums Up, 96-97 b. Pepsi, 98-99 c. Thums Up, 99-00 d. CocaCola, 97-98
18. The central government till 1998 used to impose excise duty of Rs 30 per case, which was increased to Rs 60 per case in the beginning of 1999. What is the total excise duty collected by the government in the year 2000-01 from the sales of these three companies?
a. Rs 80 cr b. Rs 90 cr c. Rs 100 cr d. Rs 70 cr
19. In the year 2001-02, Thums Up recorded a growth of 40%, while Pepsi grew by 25% over the previous year. What is the difference in the sales of these two brands?
a. 1.8 mn cases b. 2.1 mn cases c. 1.6 mn cases d. 2.4 mn cases
20. In the year 2001-02, the ratio of the sales of the three brands remain the same as that in 1995-96. Then, what should be the total sales of colas if the sale of Coca Cola increased by 10% over the previous year?
a. 15.7 millions b. 8.8 millions c. 10.2 millions d. None of these

Exercise - 9(B)

Directions : Questions 1 to 5 are based on the following data.

The first graph shows the demand for and supply of Rice (in tons) for the years 1990 to 1996 and the second graph shows the demand for and supply of Wheat (in tons) for the years 1990 to 1996. (**Time lag** is defined as the time taken for the demand of a particular year to be met).

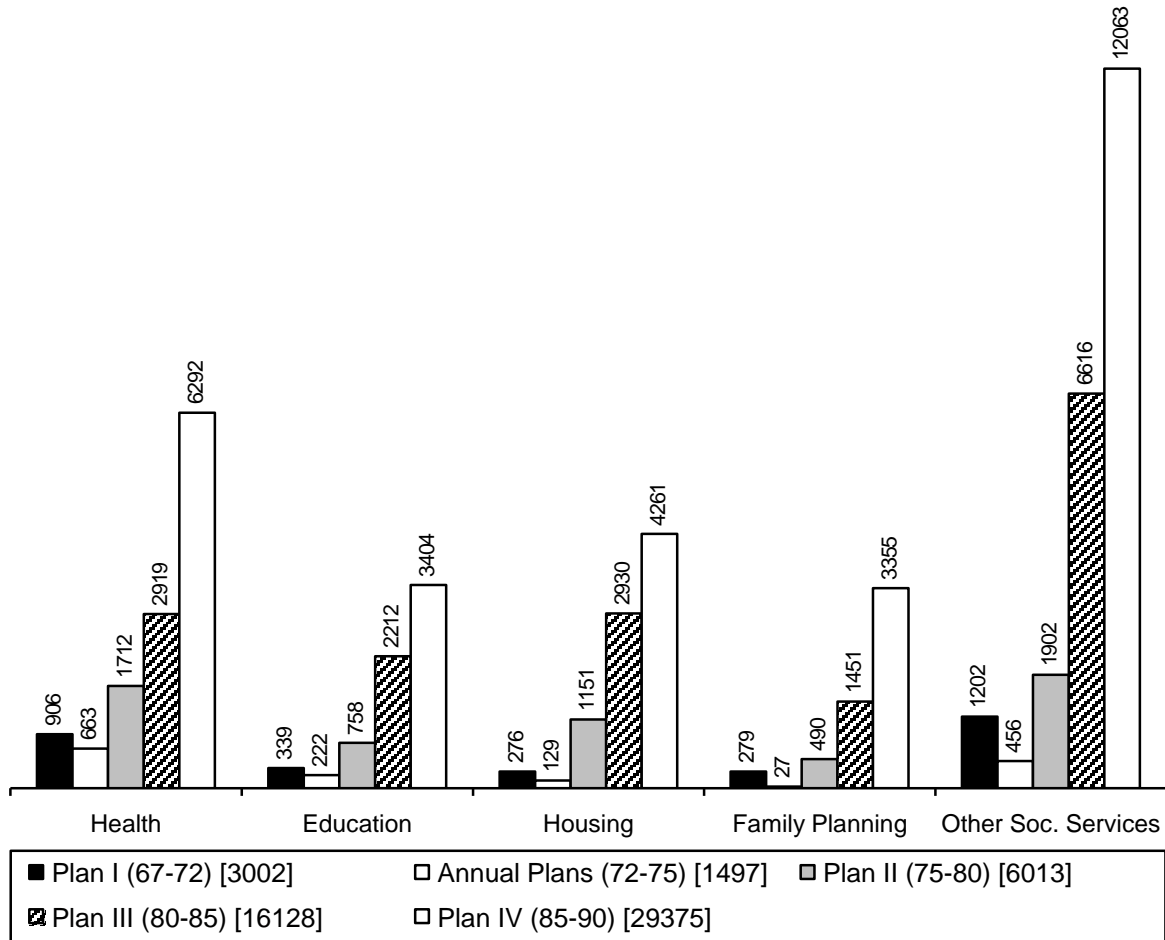


- What is the approximate time lag between the demand for and the supply of Rice and Wheat?
a. 2 years, 1 year b. 1 year, 2 years c. 1 year, 1½ years d. 1½ years, 1 year
- The total demand for Wheat from 1990 to 1996 forms what percent of the total supply of Rice from 1990 to 1996?
a. 110% b. 113% c. 125% d. 132%
- The difference between the total demand and supply of wheat for the given data forms what percent of the difference between the total demand and supply of Rice for the given data?
a. 55% b. 70% c. 180% d. 190%
- What is the approximate lag between the demand for Rice and Wheat together and the corresponding supply?
a. 1 year b. 1½ years c. 2 years d. 2½ years
- If the lag between the demand and supply of Rice and wheat are interchanged, what percent of the difference between the demand and supply of Wheat for the years 1993 to 1995 is formed by the difference between the demand and supply of Rice for the years 1993 to 1995?
a. 255% b. 285% c. 315% d. 335%
- In which year was the maximum percent of demand of wheat fulfilled?
a. 1990 b. 1993 c. 1994 d. 1996



Directions : Questions 7 to 14 are to be answered on the basis of the information available in the following bar graph.

PLAN OUTLAY ON SOCIAL SERVICES (Rs. Crore)



The figures next to the Plans within the oval brackets indicate the period and those within the rectangular brackets indicate the total outlay on social services for that year. All the above figures for outlays are in Rs Crore.

Using the figures of Plan III as Base = 100, the figures for Plans V and VI have been given in the table below.

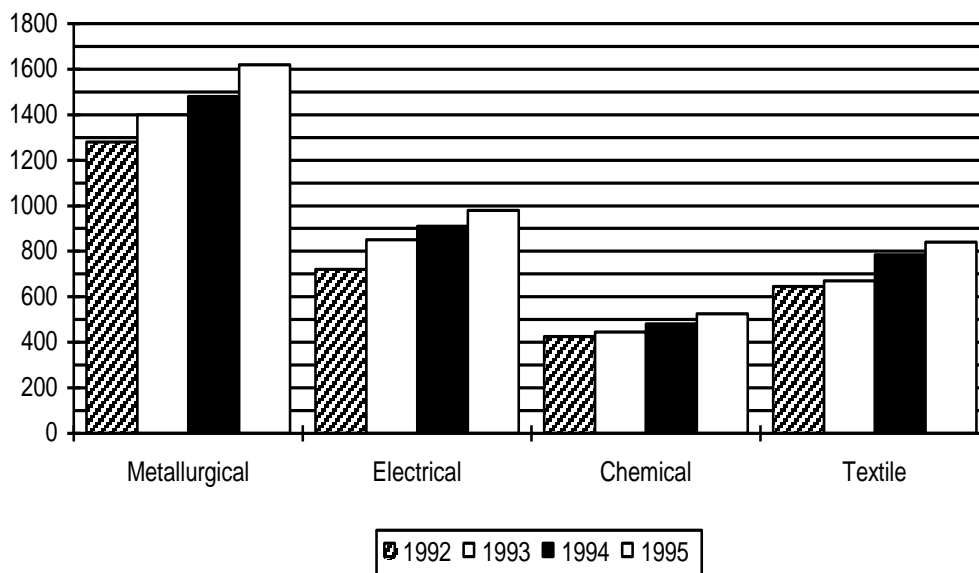
Plan V (90-95)	350	300	250	400	250
Plan VI (95-2000) projected	500	450	350	550	400

- What has been the expenditure (in Rs crore) on Other Social Services from 1967 to 1995?
a. 65243 b. 36128 c. 38779 d. 35712
- The outlay on Health in Plan V is what percent of the outlay on Education in Plan VI?
a. 102.63% b. 97.67% c. 153.96% d. 56.2%
- The average annual expenditure on Health in the Annual Plans period differed from the average annual expenditure on Health during the Plan II period by how many crore?
a. 121.4 b. 1049 c. 209.8 d. 349.6
- The total outlay of Plan III forms what percent of the outlay on education of Plan V?
a. 341.14% b. 140.6% c. 243.04% d. 182.4%

11. From Plan III to Plan IV, the outlay on which of the following showed the maximum percent increase?
a. Health b. Education c. Family Planning d. Housing
12. If the outlay is mentioned at constant (i.e. 1980) prices, then what is the actual outlay (in Rs crore) for Family Planning in Plan IV, if in this period the value of the 1980 rupee is 70 paise?
a. 5704 b. 4863 c. 2348.5 d. 1973.5
13. If the given data is at current prices with a 20% drop in the value of the rupee during each plan after Plan II; what will be the outlay (in Rs. crore) on Education in Plan IV at constant prices?
a. 5318.75 b. 2178.56 c. 2042.4 d. 5673.33
14. During Plan IV, 40% of the outlay on Housing was meant for eradication of certain slums and providing the same people with flats. But 25% of those flats were illegally allotted to the relatives of ministers and corporators. What was the actual amount spent on eradication of slums?
a. 1278.3 b. 426.1 c. 1704.4 d. Insufficient data

Directions : Questions 15 to 22 are to be answered with the help of the following bar graph.

Number of Industrial Licence Holders



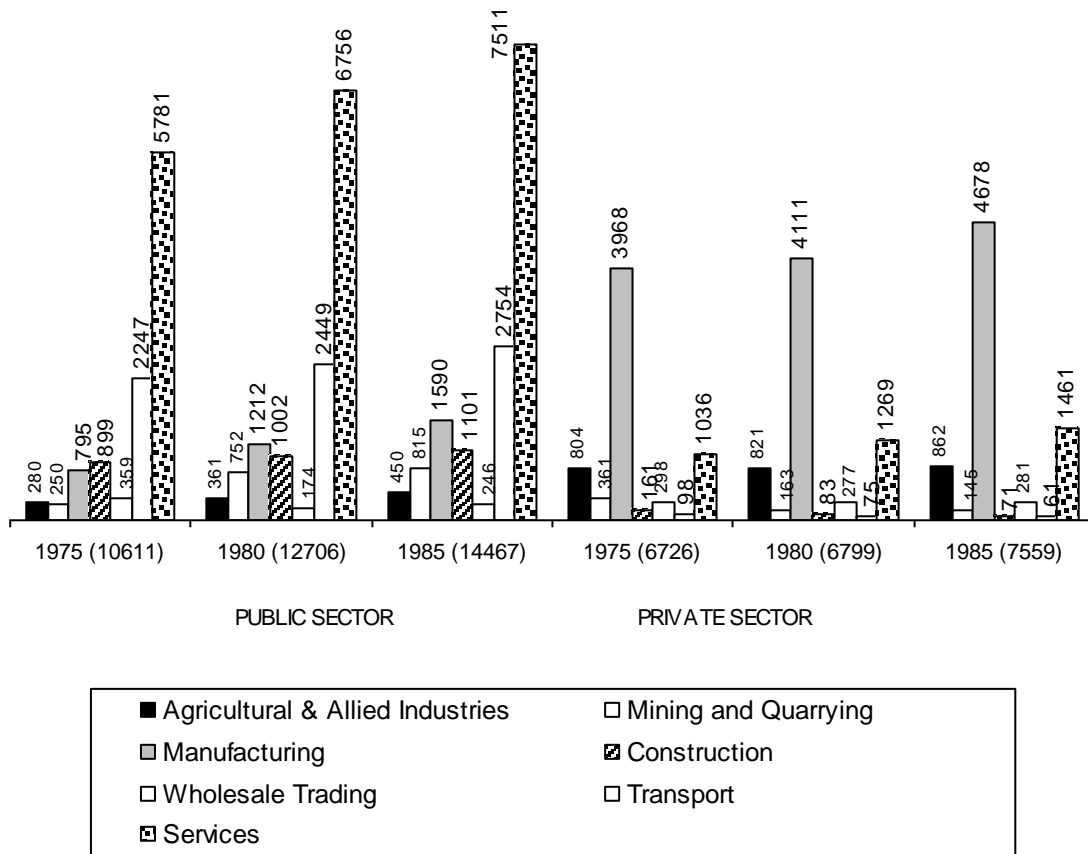
15. What is the difference between the total number of licences issued to all the mentioned industries in 93 and 92?
a. 120 b. 15 c. 155 d. 60
16. The number of newly issued licences to the Electrical Industry between '92 and '94 forms approximately what percent of a similar increase in the Metallurgical industry during the same period?
a. 95% b. 125.25% c. 143.4% d. Insufficient data
17. Which of the following industries has had the smallest percentage increase in the number of licences issued over the 4-year period mentioned in the graph?
a. Metallurgical b. Electrical c. Chemical d. Textile
18. If the average cost of setting up a new textile unit is Rs. 20 lakh while maintaining an existing unit is Rs. 1 lakh, what was the average expenditure for a textile unit in the year 1993?
a. Rs. 1.94 lakh b. Rs. 23 lakh c. Rs. 11.45 crore d. Rs. 1.71 lakh



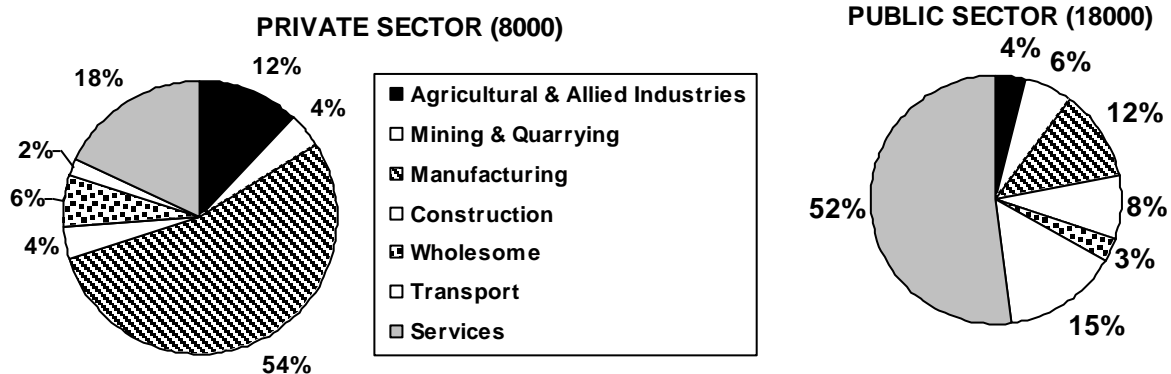
19. Due to a new government regulation in 1994, 40% of the new licences issued to chemical industries in 1994 and 20% of the existing industries in the chemical sector were forced to shut down because of non-conformance to the new environmental laws. What percent of the chemical industries remained unaffected?
a. 66.6% b. 24.1% c. 61.3% d. 78.5%
20. The year 1996 witnessed a major industrial recession because of which a few of the metallurgical industries had to shut down and now their number became equal to twice that of the chemical industries in 1995. What was the percentage decrease in the number of metallurgical industries?
a. 54.3 b. 35.2 c. 46.8 d. Indeterminable
21. If in 1993 licences were issued to 22 polyester units increasing their number by 10%, polyester units constituted what percentage of its parent industry?
a. 54% b. 32% c. None of these d. Indeterminable
22. In 1995, to apply for a licence, which would be issued only after 12 months, the application fee was Rs.1500, the NOC cost Rs.3500 and stamp duty was Rs.200. How much money did the government earn on account of these new applications in the chemical industry?
a. Rs 2.6 lakh b. Rs 1.3 lakh c. Rs 1.56 lakh d. Indeterminable

Directions : Questions 23 to 30 are based on the following graphs.

GROWTH IN EMPLOYMENT



Figures within brackets indicate the total for the corresponding year. All figures in thousands.



The pie -charts are for 1990.

23. The increase in employment opportunity in the manufacturing industry within the public sector form 1975 to '85 formed what percent of the private sector growth over the same period for the same industry?
 - a. 91%
 - b. 560%
 - c. 17.85%
 - d. 112%
24. What is the difference in the country's net growth in employment within the public sector in the field of agriculture and construction combined from 1980 to 1990? (in thousands)
 - a. 827
 - b. 627
 - c. 727
 - d. 797



25. The growth in employment in the industry with the largest employment share in the public sector formed what percent of the growth in employment in the industry with the largest employment share in the private sector in 1990?
a. 46.25% b. 54.5% c. 183.33% d. 216.67%
26. If 2 out of every 5 of those who were recruited in the public sector in 1990 were graduates, how many non-graduates (in thousands) did the public sector's transport industry recruit in that year? (Assume uniform distribution)
a. 1380 b. 1180 c. 1620 d. 1560
27. What is the annual growth rate in employment opportunities in the mining and quarrying industry from '75 - '90 in the public sector?
a. 12% b. 17% c. 22% d. 332%

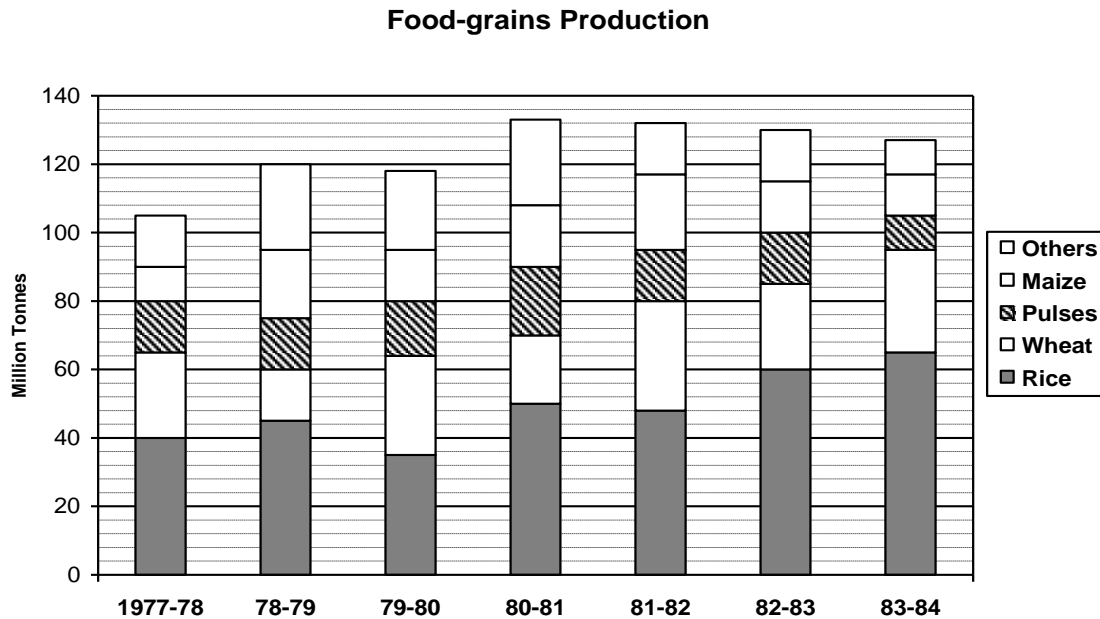
If the values of 1990 are taken as Base = 100, then the values of Public Sector in 1995 are given below, with the private sector values mentioned within the brackets.

Agriculture	= 115 (110)	Mining & Quarrying	= 110 (110)
Manufacturing	= 120 (110)	Construction	= 120 (90)
Wholesale	= 80 (105)	Transport	= 105 (80)
Services	= 110 (120)		

28. The construction industry in the private sector has witnessed what percent growth in growth of employment from 1980 to '95?
a. 203% b. 247% c. 279% d. 169%
29. The growth in employment within the services industry in the private sector in 1995 has witnessed what percent deviation from the growth within the manufacturing industry in the public sector in 1995?
a. -33.3% b. -16.66% c. +16.66% d. +33.3%
30. In the year 1995 what is the actual growth in the employment figure (in hundreds) for the private sector industry showing the greatest percentage fall in growth in employment over 1990?
a. 1280 b. 12800 c. 128000 d. 1280000

Exercise - 10(A)

Directions : Questions 1 to 8 are to be answered on the basis of the information available in the following bar graph.



- The commodity which registered the maximum increase in production between 1977 and 1984 showed what percentage increase in the production?
a. 62.5% b. 70% c. 56% d. 160%
- The average annual production of wheat (in million tonnes) during the given period was...
a. 33 b. 20 c. 25 d. 46
- What is the ratio of the cumulative production of maize from 1978-83 to that of pulses from 1979-83?
a. 1.36 b. 0.82 c. 1.00 d. 0.68
- For how many years was the production of wheat less than or equal to the production of the other foodgrains but more than or equal to the production of maize?
a. 0 b. 1 c. 2 d. None of these
- What has been the greatest percentage increase within a single year in the production of wheat?
a. 85.5% b. 98.1% c. 93.3% d. None of these

The following figures indicate the production of the given categories for the year 1984-85 in terms of the number of times the production in the year 1982-83.

Rice = 1.25	Wheat = 1.2	Pulses = 1.5
Maize = 1.6	Others = 1.4	

- The production of wheat in 1984-85 is how many times more than the lowest production of wheat within the given period?
a. 0.5 b. 1.16 c. 2 d. None of these
- What is the total production of foodgrains in the year 1984-85 (in million tonnes)?
a. 172.5 b. 178.5 c. 183.0 d. None of these

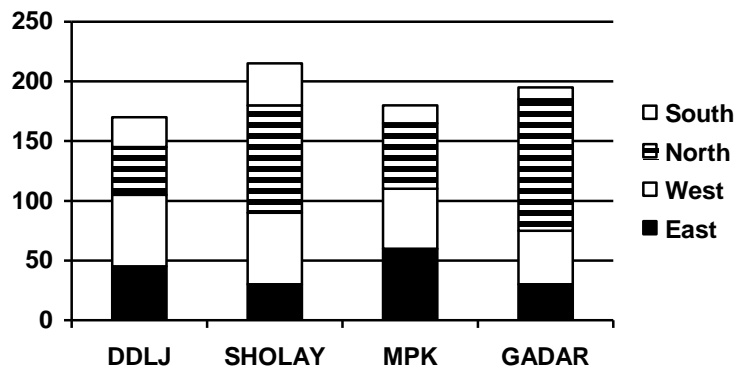


Directions: Answer questions 8 to 15 with the help of the following table.

STATES	Narrow Gauge (KM)	Metre Gauge(KM)	Broad Gauge(KM)
Andhra Pradesh	440	180	580
Assam	40	120	72
Bihar	190	248	216
Gujarat	150	290	415
Haryana	-	60	110
Jammu and Kashmir	175	35	244
Karnataka	65	122	365
Kerala	18	45	190
Madhya Pradesh	220	185	536
Orissa	154	136	190
Punjab	62	-	238
Rajasthan	125	181	276
Tamil Nadu	110	293	390
Uttar Pradesh	390	243	429
West Bengal	165	110	380
Union Territories	25	45	65

8. What percentage of Karnataka's railway network has broad gauge tracks?
a. 66.4% b. 69.16% c. 71.2% d. None of these
9. What percent of Madhya Pradesh's railway network does not have broad gauge tracks?
a. 43% b. 49% c. 57% d. 62%
10. What percent of Orissa's railway network has metre gauge tracks?
a. 18.5% b. 21.25% c. 24.75% d. None of these
11. What percent of Rajasthan's railway network is the narrow gauge and the broad gauge combined?
a. 31% b. 46% c. 59% d. None of these
12. If Delhi accounts for 35% of the total length of railway tracks within Union Territories, what is the length of railway tracks within the capital?
a. 47.25 km b. 51.25 km c. 54.75 km d. 44.25 km
- If the conversion rates (in Rs per km) for railway tracks of various gauges are as given below:
NG to MG = 2500 NG to BG = 3500 MG to BG = 1500
13. If West Bengal wants to convert all the existing narrow gauge tracks to metre gauge and all the existing metre gauge tracks to broad gauge, what will be the cost that they will have to incur?
a. Rs.577500 b. Rs.645500 c. Rs. 682500 d. None of these
14. Bihar decides to do away with the narrow gauge tracks by converting them to metre gauge and broad gauge tracks in equal ratios. What is the expenditure that they will have to incur?
a. Rs.512500 b. Rs.547500 c. Rs.585000 d. None of these
15. Tamil Nadu decides to convert all its narrow gauge tracks to metre gauge. After this work got over, they decide to convert all the metre gauge tracks to broad gauge. What was the total expenditure that they had to incur?
a. Rs 879500 b. Rs 907500 c. Rs 962500 d. None of these

Directions: Questions 16 to 20 are based on the following data:
The graph represents viewers in millions for the 4 movies .



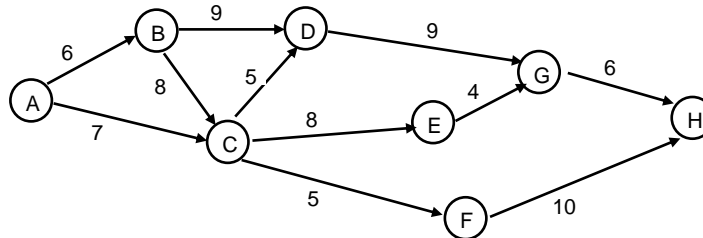
16. The Government declared GADAR tax-free after 2 months of its release. But the first 2 months contributed to 60% of the total viewers of the movie. SHOLAY, because of excessive violence could not be declared tax-free. If the entertainment tax is Rs 8.60 per viewer, what is the difference in the tax collected from GADAR and SHOLAY?
 - a. Rs 100 cr
 - b. Rs 85 cr
 - c. Rs 120 cr
 - d. Rs 110 cr
17. Considering average ticket price in the Northern region to be Rs 20, and the same in the Southern region to be Rs 25, by what percent was the total collection from the Northern region more than the collection from the Southern region for the 4 movies?
 - a. 100%
 - b. 125%
 - c. 160%
 - d. 200%
18. Which of the following is true?
 - a. People of Northern region are crazy for action movies
 - b. People of Southern region don't like Hindi movies
 - c. Northern region is the biggest contributor to the total revenue of the film industry
 - d. Indeterminable
19. If due to extreme violence in MPK, the movie was declared for above 16 years of age only, 30% of the total viewership would not be allowed to see MPK..Of them, 80% would watch the movie next year, and another 10 million more would watch the movie next year, while SHOLAY adds up another 10% in the number of viewers. By the end of the next year, which movie would be the biggest hit, in terms of the number of viewers?
 - a. SHOLAY
 - b. MPK
 - c. Both
 - d. Indeterminable
20. If 30% viewers of SHOLAY watch all the movies of Deol family, Deol loyalist viewers are what percent of total viewers of GADAR?
 - a. 33%
 - b. 40%
 - c. 25%
 - d. Indeterminable



Exercise - 10(B)

Directions: Questions 1 to 3 are based on the following network.

The process of manufacturing of a unit of a certain product is shown in the network. The manufacturing process starts at the node A and the finished product is obtained at the node H. The network gives details about the activities involved in the process and the time required (in minutes) for each activity. All activities in the network must be completed to obtain the finished product.



- How long does the process take to manufacture 25 units of the product?
a. 77 hrs b. 32 hrs, 5 min c. 14 hrs, 10 min d. 34 hrs
- The above process is applied to a machine which can be used for 10 hours a day with 10 minute breaks after every 10 products. The machine is operated everyday. What is the maximum number of units that can be produced in a week, if a partly processed unit is scrapped?(provided 1 week = 7 days.)
a. 54 b. 119 c. 123 d. Insufficient data
- If the duration of activity (B - D) is reduced by 3 minutes and that of activities (G - H) and (F - H) are increased by 2 and 4 minutes respectively, what will be the approximate percent change in the time taken to manufacture one unit of the product?
a. 5.88% increase b. 5.88% decrease c. 5.2% increase d. 5.2% decrease

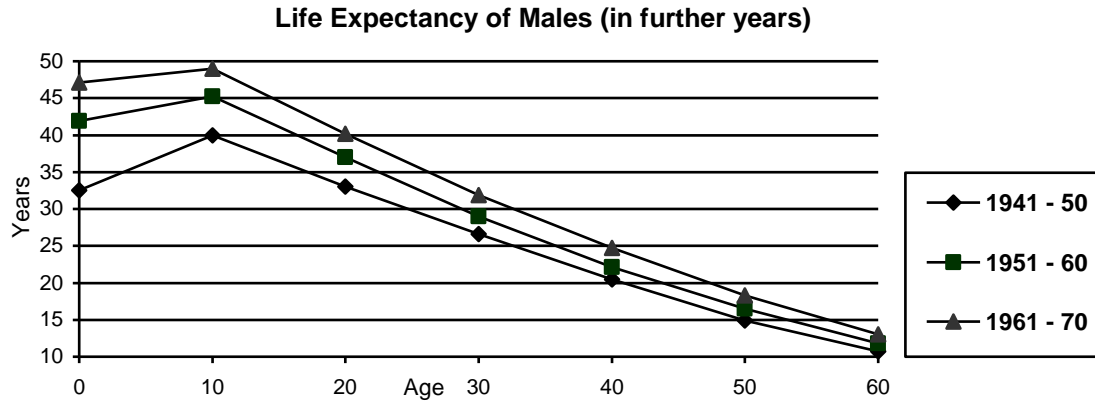
Directions: Questions 4 to 6 are based on the following data.

A factory uses two machines, M_1 and M_2 to manufacture three types of soap, P, Q and R. The two machines operate 8 hours a day each. The efficiency of the two machines with respect to the three types of soap is given in the table below. The numbers indicate the time taken (in minutes) by the two machines to manufacture one unit each of the three types of soap.

	M_1	M_2
P	8	12
Q	12	9
R	10	12

- What is the maximum number of soaps that can be produced in a day?
a. 113 b. 65 c. 85 d. 127
- A soap of type R can be manufactured only after three soaps each of types P and Q have been manufactured. If fifteen soaps of type R are needed on a particular day, what is the extra time that the machines will have to operate?
a. 25 min b. 15 min c. 40 min d. None of these
- If the efficiency of a machine is defined as the total maximum number of sets of soaps P, Q and R manufactured in a day, what is the ratio of the efficiency of the first machine to that of the second?
a. 1.142 b. 0.875 c. 0.857 d. 1.166

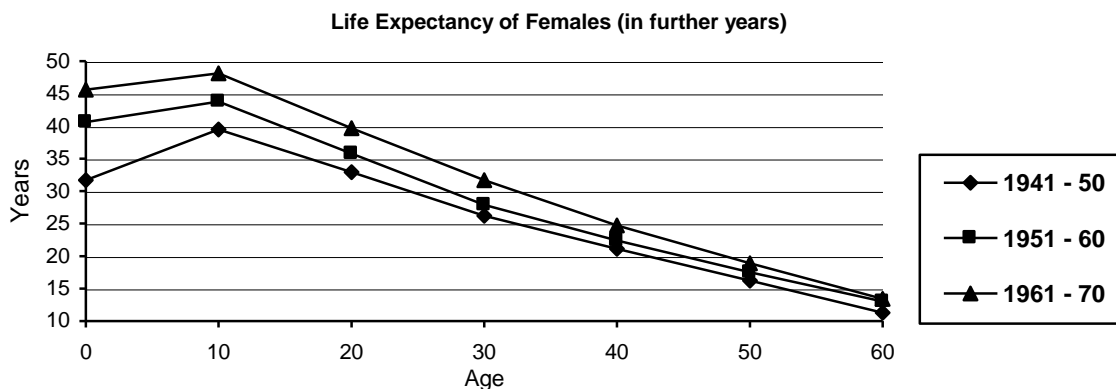
Directions : Questions 7 to 14 are to be answered with the help of the following graphs.



7. On 15th of August 1947, Mrs. Kiran Kapur celebrated her 20th birthday. What was the year she was expected to live upto at that time?
 - a. 1980
 - b. 1981
 - c. 1969
 - d. 1970
8. By approximately what percent did the overall life of a 40 year male in 1961 increase over that of a 40 year old male in 1941?
 - a. 16%
 - b. 19.5%
 - c. 6.6%
 - d. None of these
9. By how many years did the life expectancy of a female, who was 50 years old in 1961, increase from 1941 to 1961?
 - a. 15 years
 - b. 8 years
 - c. 13 years
 - d. 10 years
10. In how many age categories was the life expectancy of females greater than or equal to that of males for the entire period 1941-61?
 - a. 1
 - b. 2
 - c. 3
 - d. 4

For the remaining questions, refer to the following data:

A new drug “Buddhon-di-Jawaani” introduced in the market guarantees an increase in the life



expectancy. This increase is equal to 150 times the reciprocal of the age in the age category in 1971-80, irrespective of the gender. The Age Category of a person is that multiple of 10 which his age would be in any of the years between 1971 and 1980. This increase so obtained must be added to the

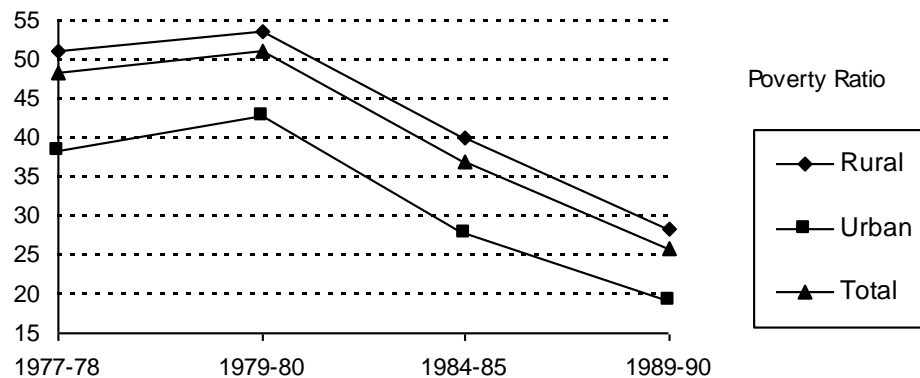


life expectancy (in further years) of the Age Category previously calculated in 1961-70. As this is not applicable to new-borns, their life expectancy for 1971-80 is 53 years for males and 52 years for females.

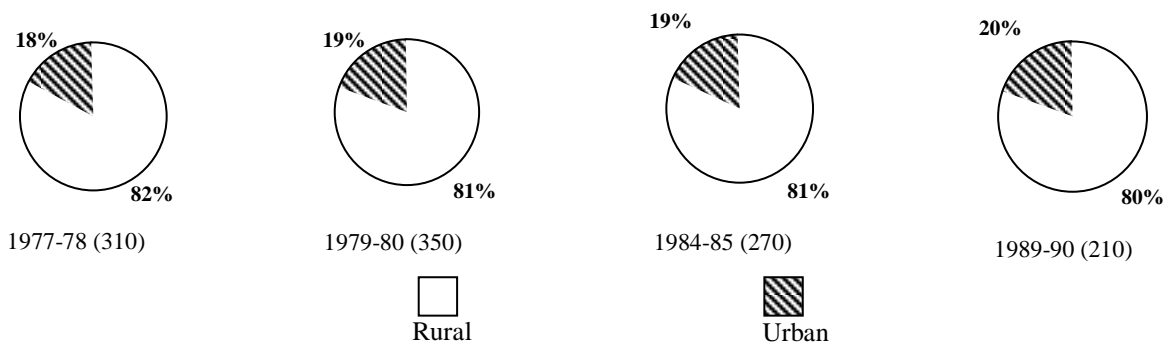
11. What is the life expectancy (in further years) of a 20 year old male in 1971-80?
a. 75.5 b. 47.5 c. 55.5 d. 67.5
12. What is the expected age that a female born in 1931 can live to according to the 1971-80 expectations, if she takes the above-mentioned drug?
a. 65.5 years b. 68.75 years c. 71.5 years d. 73.75 years
13. If Rabri Devi gave birth to her first daughter in 1941 when she was 20, and to her ninth son when she was 40, what is the difference between the life expectancies of these two children in 1971, if they have been administered the drug?
a. 4 years b. 5 years c. 6 years d. 7 years
14. A person born in 1925 can expect what percent increase in his life from the start to the end of the period given in the graph?
a. 43.4% b. 14.1% c. 22.6% d. Insufficient data

Directions: Questions 15 to 22 are based on the following graphs.

Population Below Poverty Line (%)



Area-wise Distribution of Poor People



The figures in brackets show the Total Poor Population (in millions).

Poverty Ratio is the number of poor people (i.e. those below the Poverty Line) in every hundred of population of that area.

15. From the given data, we can say that the population of the country in 1989-90 is about...
a. 820 million b. 850 million c. 880 million d. Insufficient data
16. What was the urban population above the Poverty Line in 1979-80?
a. 89 million b. 96 million c. 81 million d. Insufficient data
17. What is the number of people who lived in rural areas in 1977-78?
a. 500 million b. 515 million c. 525 million d. None of these
18. What is the population above the poverty line in the rural areas in 1989-90?
a. 432 million b. 449 million c. 463 million d. None of these
19. What was the total urban population in 1984-85?
a. 183.2 million b. 196.7 million c. 207.4 million d. None of these
20. What is the increase in the population living above the Poverty Line over the given period?
a. 260 million b. 275 million c. 295 million d. None of these
21. If in 1989-90, 10% of the poor from the rural area come to the urban area and half of them still remain below the Poverty Line, what percent of the total poor are from the urban areas?
a. 25% b. 33.3% c. 40% d. Insufficient data
22. If in 1989-90, due to a massive earthquake, 20% of the population above the Poverty Line falls below the Poverty Line, what approximately is the ratio of those above the Poverty Line to those below it?
a. 3 : 2 b. 7 : 3 c. 9 : 5 d. None of these

Directions: Questions 23 to 30 are to be answered on the basis of information available in the following table and the data immediately following it.

Company	Model	Expected Launch	Project Cost (Rs. Crore)	Annual Capacity	S.P. of Vehicle (Rs. Lakh)
TELCO	Safari	Jan '98	400	5000	7.5
TELCO	Mint	Oct '98	1700	25000	2.5
Hyundai	D'Santro	Sep '98	750	20000	3.0
Fiat	Palio	Mar '99	640	16000	3.2
Honda	City	Apr '98	800	8000	6.5
Mitsubishi	Lancer	Jun '98	900	6000	7.0
Kinetic	Small Car	Sep '98	540	12000	1.2

Additional Data:

Assume that all the vehicles produced are sold.

Assume that production rates are uniform.

The Raw Material cost of a vehicle is 30%, the taxes are 10% and the production cost is 10% of the Selling Price. The remaining is the Profit made by the manufacturer.

23. How many Mints must TELCO sell to break even?
a. 108000 b. 136000 c. 170000 d. None of these
24. If Fiat's Palio is launched at its scheduled time, by when should they be able to break even?
a. Sept 2000 b. Mar 2001 c. Sept 2002 d. Sept 2001
25. Kinetic's small car will be able to cover what percent of the cost of project after a complete year?
a. 8.33% b. 13.33% c. 17.5% d. 20.33%
26. What part of the cost of project remains unobtained for Mitsubishi after 15 months of sales of the Lancer?
a. 28% b. 36% c. 45% d. None of these



27. The Hyundai D'Santro project gets delayed by two years. If interest is calculated at 41% annually, how many vehicles must be sold to break even, if the selling price is increased by 20%?
- a. 66666 b. 83333 c. 91666 d. 99999
28. Immediately after breaking even, Honda installs ASB kits on its City model. This requires an additional Rs.40 crore towards the project cost. At the same time the selling price of the car is increased by Rs 50000. At the end of an entire year from then, what is the profit that Honda's City makes?
- a. Rs. 180 crore b. Rs. 210 crore c. Rs. 240 crore d. Rs. 270 crore
29. To meet the excessive initial demand for Tata Safari, TELCO decides to increase the production capacity by 40% by investing Rs.60 crore more. If this done before the production of Safari started, approximately how many Safaris must TELCO sell to break even?
- a. 12250 b. 12965 c. 13425 d. 13995
30. A year after the launch of Lancer, Mitsubishi decides to launch a new model using the same assembly line. The line is capable of providing twice the production capacity as that of the Lancer, while the new car will be sold at half the price of the Lancer. What will be the ratio of annual profits of the Lancer to those of the new model, if the initial cost incurred for the new model is ignored?
- a. 4 : 1 b. 1 : 2 c. 1 : 4 d. 1 : 1

Answers To Data Interpretation

Exercise - 1(A)

1-a	2-c	3-c	4-c	5-d	6-c	7-d	8-a	9-a	10-c
11-b	12-b	13-d	14-b	15-a	16-d	17-a	18-a	19-c	20-a

Exercise - 1(B)

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

Exercise - 2(A)

1-c	2-b	3-a	4-c	5-b	6-b	7-d	8-a	9-b	10-b
11-d	12-b	13-d	14-c	15-d	16-c	17-c	18-d	19-b	20-c

Exercise - 2(B)

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

Exercise - 3(A)

1-c	2-a	3-d	4-b	5-b	6-b	7-b	8-c	9-b	10-c
11-a	12-b	13-d	14-d	15-a	16-c	17-c	18-a	19-a	20-b

Exercise - 3(B)

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

Exercise - 4(A)

1-c	2-b	3-d	4-b	5-d	6-c	7-b	8-c	9-a	10-b
11-a	12-a	13-a	14-d	15-d	16-d	17-c	18-c	19-d	20-c

Exercise - 4(B)

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

Exercise - 5(A)

1-b	2-c	3-d	4-c	5-b	6-b	7-c	8-c	9-c	10-b
11-a	12-d	13-b	14-c	15-d	16-c	17-d	18-a	19-d	20-c

Exercise - 5(B)

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

Exercise - 6(A)

1-c	2-c	3-c	4-b	5-a	6-a	7-c	8-a	9-b	10-b
11-c	12-d	13-d	14-b	15-c	16-d	17-a	18-a	19-c	20-d

Exercise - 6(B)

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

**Exercise - 7(A)**

1-a	2-c	3-c	4-b	5-a	6-d	7-b	8-c	9-d	10-b
11-a	12-d	13-d	14-c	15-a	16-d	17-a	18 - c	19 - c	20 - a

Exercise - 7(B)

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

Exercise - 8(A)

1-c	2-a	3-d	4-c	5-b	6-d	7-c	8-c	9-d	10-c
11-b	12-a	13-c	14-c	15-a	16-c	17-d	18-d	19-c	20-b

Exercise - 8(B)

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

Exercise 9(A)

1-c	2-c	3-c	4-d	5-d	6-a	7-b	8-c	9-a	10-a
11-c	12-d	13-c	14-c	15-b	16-b	17-c	18-b	19-a	20-a

Exercise - 9(B)

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

Exercise - 10(A)

1-a	2-c	3-a	4-b	5-c	6-d	7-a	8-a	9-a	10-d
11-d	12-a	13-a	14-d	15-a	16-b	17-c	18-d	19-a	20-a

Exercise - 10(B)

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

Solutions to Data Interpretation

Note:

In the solutions, if a quantity has been denoted as, let us say, 155 (+)%, it means that the actual answer is slightly higher than 155%. Similarly, 155 (-)% would imply that the actual answer is slightly less than 155%. If (++) or (--) signs are used, it means that the actual answer is much greater (or lesser, respectively) than the obtained answer. The reason for mentioning the answer in such a format is that the obtained answer, 155, in this case, has been arrived at after certain approximations. However, the (+) and (-) signs give the range of the correct answer.

In some cases, the details of all the steps of approximations in the calculations have not been mentioned in order to make the solutions more concise. Students are however urged to do the calculations mentally, using the approximation methods and short-cuts which they have been told.

Exercise - 1(A)

Solutions to Questions 1 to 8.

1. The expenditure on magazines is approximately 20%. A quarter of that $\approx 5\%$, which corresponds to local radio. Hence answer option is a.
2. The national advertising expenditures of four years was less than that of 1989. Their average is approximately $[(5+5.4+5.7+5.7)/4] \approx \text{Rs. } 545 \text{ crore}$. Hence answer option is c.
3. One-third of the expenditure of 1992 ≈ 211 , which corresponds to 20% of that of 1997. So the number of categories having an expenditure more than 20% in 1997 is 3 (local TV, Cable TV and magazines). Hence answer option is c.
4. Thrice, in the years 1992, 1996 and 1997. Hence answer option is c.
5. Radio advertising constitutes in all 5.2% of the 1050 crore. This corresponds to Rs. 54.6 crore, which is Rs. 546 million. So the answer is (d) None of these.
6. The required percentage increase $\approx [(1050-560)/560] \times 100 \approx 88\%$. Hence answer option is c.
7. Since the allocation of network radio expenditure in 1987 is not known, the answer is indeterminable. Hence answer option is d.
8. Filumfair has a share of 33.33% (i.e one-third) of 37.5% [i.e. $(3/8)^{\text{th}}$] of the expenditure on magazines (which itself is 20.6%). Thus, the revenue generated by Filumfair $\approx [(1/3) \times (3/8) \times 20\% \text{ of } 1050] \approx \text{Rs. } 26.2 \text{ crore}$. Hence answer option is a.

Solutions to Questions 9 to 12

9. During the week when Narayan works more than he rests, he earns Rs. 20 per hour. During the next week, when he rests more than he works, he earns Rs. 10 per hour. This pattern is constant over the next two weeks. The salary in the first week is $(20 \times 5 \times 6) = \text{Rs. } 600$, which is also the same for the third week. The salary in the second week is $(10 \times 2 \times 6) = 120$, which is also the salary for the fourth week. Therefore, Narayan's total salary for the first month is Rs. 1440. Hence answer option is a.
10. Narayan works 7 hours a day and rests 3 hours a day during the fifth and the seventh week. His salary in the fifth week is $(20 \times 7 \times 6) = \text{Rs. } 840$, which is also the same for the seventh week. The salary in the sixth week is $(10 \times 3 \times 6) = 180$, which is also the salary for the eighth week. So, Narayan's total salary for the second month is Rs. 2040.
Narayan works 6 hours a day and rests 4 hours a day during the ninth and the eleventh week. His salary in the ninth week is $(20 \times 6 \times 6) = \text{Rs. } 720$, which is also the same for the eleventh week. The salary in the tenth week is $(10 \times 4 \times 6) = 240$, which is also the salary for the twelfth week. So, Narayan's total salary for the third month is Rs. 1920.



Narayan works 8 hours a day and does not rest during the thirteenth and the fifteenth week. His salary in the thirteenth week is $(20 \times 8 \times 6) = \text{Rs. } 960$, which is also the same for the fifteenth week. The salary in the fourteenth week is $(10 \times 0 \times 6) = 0$, which is also the salary for the sixteenth week. So, Narayan's total salary for the fourth month is Rs. 1920.

We have already calculated Narayan's salary for the first month as Rs. 1440. So, Narayan's total salary for the first four months is Rs. 7320. Therefore, his average salary at the end of the first four months is Rs. 1830. Hence answer option is c.

11. Narayan's salary for the third month has been calculated as Rs. 1920. After the new policy is implemented, we will have to calculate the income per week and also the deduction for hours of rest. Narayan works 6 hours and rests 4 hours in the ninth week. His income in the ninth week is $(25 \times 6 \times 6) = \text{Rs. } 900$. At the same time, the deduction amounts to $(5 \times 4 \times 6) = \text{Rs. } 120$. So, Narayan's net income for the ninth week is Rs. 780, which is also the income for the eleventh week.
His income in the tenth week is $(25 \times 4 \times 6) = \text{Rs. } 600$. At the same time, the deduction amounts to $(5 \times 6 \times 6) = \text{Rs. } 180$. So, Narayan's net income for the tenth week is Rs. 420, which is also the income for the twelfth week. So, Narayan's total income for the third month, under the new policy, is Rs. 2400.
Therefore, the change in Narayan's income for the third month is $= 2400 - 1920 = \text{Rs. } 480$.
Hence answer option is b.
12. We have already calculated the income for the first, second and third month as Rs. 1440, Rs. 2040 and Rs. 2400 respectively. During the thirteenth week, Narayan works 8 hours with no rest. His income for the thirteenth week is $(25 \times 8 \times 6) = \text{Rs. } 1200$, which is also the salary for the fifteenth week. As he does not rest during these two weeks, there are no deductions. During the fourteenth week, Narayan does not work and rests for 8 hours a day. So, the deduction in the fourteenth week is $(5 \times 8 \times 6) = \text{Rs. } 240$, which is also the deduction in the sixteenth week. So, Narayan's net salary for the fourth month is $= 2400 - 480 = \text{Rs. } 1920$. Therefore, Narayan's total income at the end of sixteen weeks will be Rs. 7800. Hence answer option is b.

Solutions to Questions 13 to 20.

13. Thermal power in 1984-85 = 98927, while total generation in 1984-85 = 169183. \therefore The percentage = $[(98927/169183) \times 100] \approx 59\%$. Hence answer option is d.
14. Hydel power in 1970-71 = 25248, while in 1984-85 it is 53971. \therefore The percentage increase = $[(53971-25248)/25248] \times 100 \approx [(28/25) \times 100] \approx 114\%$. Hence answer option is b.
15. In 1960-61, the per capita consumption of power = 38.2 (from the table), while in 1980-81, the consumption = 132.3. \therefore The percentage decrease = $[(132.3-38.2)/132.3] \times 100 \approx 71\%$. Hence answer option is a.
16. Hydel power in 1950-51 = 2860; non-utilities in 1960-61 = 3186. \therefore The ratio = $2860:3186 = 0.897$ which is nearly 9:10. Hence answer option is d.
17. In 1984-85, the non-utilities were 12210; generation by the other three = [Total – non-utilities] = $119260 - 8416 = 110844$. \therefore The required percentage = $[(12210/110844) \times 100] \approx 121/11 \approx 11\%$. Hence answer option is a.
18. Generation of nuclear energy began in 1970-71, and the generation in that year was 2417. In 1984-85, the generation was 4075. \therefore The percent growth = $[(4075-2417)/2417] \times 100 \approx 67\%$.
 \therefore The simple rate of growth = $67/14 \approx 4.8\%$. Hence answer option is a.
19. We have been given that all the generated power has been consumed. The total generation in 1970-71 = 61211, of which thermal power = 28162. \therefore If the total per capita consumption is 89.8, the contribution of thermal power will be $[(28162/61211) \times 89.8] \approx [(28/60) \times 90] \approx 42$ units. Hence answer option is c.

20. The per capita consumption in 1950-51 = 17.9, while in 1984-85 it is 156.6. \therefore The ratio in which it has increased is $[(156/17.9) \approx 8.7]$, so it has increased in the ratio 1 : 8.7. Hence answer option is a.

Exercise - 1(B)

Solutions to Questions 1 to 6.

1. From the given data we can calculate the amount of gold used in the different types of jewellery as follows.

Jewellery Type	No. (000)	Amount of gold per unit			Total amount of gold		
		22 carat	20 carat	18 carat	22 carat	20 carat	18 carat
Necklaces	20	160	40	--	3200	800	---
Pendants	30	60	80	60	1800	2400	1800
Rings	30	---	140	60	---	4200	1800
Bracelets	10	---	120	80	---	1200	800
Earrings	10	---	20	180	---	200	1800
					5000	8800	6200

For question number one answer option is c.

2. Referring to the above table, the Necklaces used 3200 kg of 22 carat gold. Hence answer option is b.
3. The total number of emeralds used in Rings is $[(40\% \text{ of } 420) \times 30,000 \text{ rings}]$, while the total number of emeralds used for Bracelets is $[(60\% \text{ of } 420) \times 10,000 \text{ bracelets}]$. Thus the required ratio is 2:1, and so the answer is (d) "None of these".
4. Referring to the above table, a total of 6200 kg of 18 carat gold was used. Hence answer option is d.
5. Only necklaces and pendants contain 22 carat gold. The total number of diamonds used will be $[(70\% \text{ of } 420) \times 20,000 \text{ necklaces}] + [20\% \text{ of } 420) \times 30,000 \text{ pendants}]$. Ignoring 420 and the thousands, this number can be denoted as $1400 + 600 = 2000$. Similarly, the total number of Rubies is $[(15 \times 20) + (50 \times 30)] = 1800$, while the total number of emeralds is $[(15 \times 20) + (30 \times 30)] = 1200$. So the ratio is 2000:1800:1200 which is 10:9:6. Hence answer option is a.
6. Since bracelets and earrings are formed from 20 Carat and 18-Carat gold, and neither do they contain diamonds, no pendant can be formed. Hence answer option is d.

Solutions to Questions 7 to 14.

7. The per capita availability of milk in 1960-61 is 45.4 kg, i.e. for each person, 45.4 kg of milk was available in 1960-61. So the total production is $45.4 \times \text{population} = 45.4 \times 440 \text{ million} \approx 19980 \text{ million kg}$. i.e. $\approx 20 \text{ billion kg}$. Hence answer option is d.
8. In 1960-61, the production of fish was $(47.3-45.4) \times 440 \approx 836 \text{ million kg}$. In 1970-71, the production was $(43.3-40.2) \times 550 \approx 1705 \text{ million kg}$; thus the increase = 870 million kg. Hence answer option is d.
9. The production of potato and tapioca in 1950-51 = $(64.7-54.4) \times 360 \approx 3700 \text{ million kg}$, while in 1980-81, its production is $(81.4-56.9) \times 686 = 24.5 \times 686 \approx 25 \times 670 \approx 16750 \text{ million kg}$. Thus the percentage increase = $[(16750-3700)/3700] \times 100 \approx 350\%$. Hence answer option is d.
10. The total production of banana in 1970-71 = $(48.9-43.3) = 5.6 \times 550 = 56 \times 55 = 55(55+1) = 3025 + 55 = 3080 \text{ million kg}$. \therefore In 1974-75 the production was 80% of 3080 = $(4/5) \times 3080 = 2464 \text{ million kg}$. Hence answer option is d.



11. Although the production of fish in 1971-72 can be calculated, the per capita availability is indeterminable because the population at that year is not known. Hence answer option is d.
12. In 1980-81, the per capita availability of potato and tapioca = $(81.4 - 56.9) = 24.5$ kg. In 1990-91, this became $1.8 \times 24.5 = 44.1$ kg. The production of potato and tapioca in 1980-81 $24.5 \times 686 = 16800$ (approx.) million kg, while its production in 1990-91 = $44.1 \times 820 = 441 \times 82 \approx 36000$ million kg. \therefore the increase $\approx 36000 - 16800 \approx 19200$ million kg. This took place over a span of 10 years, so the simple annual rate = 1920 million kg per year. Hence answer option is d.
13. It is easier to calculate the total per capita availability of 1990-91 by increasing the total per capita availability of 1980-81 by 20%, rather than increasing the per capita availability of each component by 20% and then adding all these. The total per capita availability in 1980-81 = 81.4 kg (the topmost ordinate in the band diagram), so the per capita availability in 1990-91 = $(6/5) \times 81.4 \approx 98$ kg. Thus the total availability will be $98 \times 820 \approx 80300$ million kg ≈ 80.3 billion kg. Hence answer option is d.
14. The data gives us the per capita “availability” and not “consumption”, so the answer is “Insufficient data.” Hence answer option is d.

Solutions to Questions 15 to 22.

15. Contribution of the Primary sector $\approx 40\%$ of NDP $\approx 40\%$ of 47419 ≈ 19000 crore, i.e. 190 billion. Hence answer option is c.
16. % increase in NDP = $[(57286 - 24360)/24360] \times 100 \approx 132\%$. Hence answer option is a.
17. This can't be solved by visual inspection as along with % contribution of each sector, NDP values are also changing. In 1950 – 51, contribution of tertiary sector = $0.23 \times 16800 = 3864$. In 1960 – 61, contribution of tertiary sector = $0.27 \times 24360 = 6577$. So percentage increase in 1960 – 61 = 70% (approx). In 1970 – 71, contribution of tertiary sector = $0.3 \times 34500 = 10350$. So percentage increase in 1970 – 71 = 57% (approx.) Hence answer option is a.
18. In 1970-71, the contribution of the secondary sector = [20% of 34519] = Rs. 6900 crore, while in 1980-81, it is [23% of 47419] = Rs. 10900 crore. \therefore The difference is Rs. 4000 crore. Hence answer option is a.
19. The contribution of the Primary and Tertiary = $48\% + 32\% = 80\%$ of 40365 \approx Rs. 32300 crore. Hence answer option is d.
20. The given table is already at constant prices (i.e. 1970-71) prices, so use the values as given from the graph. The contribution of the Tertiary Sector in 1985-86 = 40% of 57286 = Rs. 22915 crore. Hence answer option is c.
21. The Primary Sector is $\approx 39\%$ of the NDP = 39% of 57286 = Rs. 22340 crore in spite of a devaluation (of 70%) upto 30 paise. So at current prices, it is $22340/0.30 =$ Rs. 74472 crore. Hence answer option is b.
22. The contribution of the Secondary Sector in 1980-81 and 1984-85 is $\approx [23\% \text{ of } 47419] + [21\% \text{ of } 57286]$. This can be approximated as $[(23+21)/2]\%$ of $[47000 + 57000] \approx$ Rs. 22,900 crore. Hence answer option is d.

Solutions to Questions 23 to 30.

23. The average annual expenditure during the Seventh Plan = $60653/5 \approx 12131$. The projected exports of 1989-90 are 13831. Thus the required difference is $13831 - 12131 =$ Rs. 1700 crore. Hence answer option is d.

24. In 1984-85, the ratio was $[(380+875)/9962] \approx 1250/10,000 \approx 1/8$. In 1989-90, this ratio was $[(440+1336)/13831] \approx 1800/14000 (+) \approx 1/8 (+)$. Thus the average will be slightly greater than $1/8 (= 0.125)$. Hence answer option is b.
25. The total exports projection for 1984-85 would now be Rs. 13831 crore, at 1989-90 prices. We have to find that change, or more specifically, that reduction in the value of the rupee, which would make Rs. 13831 crore of 1989-90 equivalent to Rs. 9962 crore of 1984-85. Thus, 1 Rupee of 1989 – 90 \equiv Rs. $[9962/13831]$ of 1984 – 85 $\approx [10,000/14000] \approx 0.714$. Thus, the value of one rupee of 1989 –90 should be equal to value of Rs. 0.714 of 1984 – 85. Value of 1 Re. = 100 paise in 1984 – 85 and in 1989 – 90 1 Re. = 71.4 paise, so a reduction of 28.6%. Hence answer option is b.
26. There has been an appreciation of 30% in the value of the rupee. This means that 1 rupee, which could get 100 paise in 1984-85, can get 130 paise in 1989-90. Let the export projection in 1989-90 at current prices be y. The exports have now become worth $[y \times 130]$ crore paise, which is the same as Rs. 13831, i.e. $[13831 \times 100]$ crore paise, according to constant prices. $\therefore y = [13831 \times 100/130] \approx$ Rs. 10,640 crore. \therefore The increase in exports is $10640-9962 =$ Rs. 678 crore. Hence answer option is a.
27. In 1984-85, the expenses were 1367. In the Seventh Plan Period, the average annual exports were worth $7700/5 =$ Rs. 1540 crore. Thus the difference = $1540-1367 =$ Rs. 173 crore. Hence answer option is b.
28. In 1984-85, the expenses of all categories except “Others” amounted to $[9962- 3005] = 6957$, while in 1989, they were $[13831- 4487] = 9344$. So the percentage increase = $[(9344- 6957)/6957] \times 100 \approx 35\%$. Hence answer option is c.
29. In 1984-85, the Leather and Jute Products were $533 + 207 = 740$. The average annual value during the Seventh Plan = $(1/5)[2796 + 1078] \approx 775$. So the difference = $775 - 740 = 35$ Cr. Hence answer option is a.
30. In 1984-85, tea, Coffee and Processed Food constituted $[718+221+328] = 1267$, out of the total 9962. In 1989-90, they constituted $[770+232+424] = 1426$, out of the total 13831. \therefore The required percentage = $[(1267+1426) / (9962+13831)] \times 100 = (2693/23793) \times 100 \approx (2700/23800) \times 100 \approx 11.5\%$. Hence answer option is d.

Exercise - 2(A)

Solutions to Questions 1 to 7.

1. The supply in 1974-75 and 1984-85 was 66 and 151 respectively. \therefore The percentage increase = $[(151-66)/66] \times 100 = (85/66) \times 100 \approx (4/3) \times 100 \approx 130\%$. Hence answer option is c.
2. The decade starting from 1974-75 will end in the year 1983-84. The cumulative difference over these ten years is $12+9+5+16+12+19+15+14+13+15 = 130$. Hence answer option is b.
3. The supply in 1976-77 = 83; Requirement in 1983-84 = 145. \therefore The ratio = $83:145 \approx 8:14 \approx 0.57$. Hence answer option is a.
4. The percentage increase from 1976-77 to 1980-81 = $[(105-83)/83] \times 100 \approx 26\%$. The percentage increase in requirement from 1980-81 to 1984-85 = $[(170-120)/120] \times 100 \approx 42\%$. Thus the difference is $42-26 = 16$. Hence answer option is c.
5. Only two years, 1977-78 and 1984-85 have registered a minimum 10% increase in the requirement. Hence answer option is b.
6. In 1982-83, the supply was 124 billion kWh. \therefore The income = $124 \times 0.8 \approx$ Rs. 100 billion. Hence answer option is b.



7. Here, the data about the cost of electricity is redundant. Illegal supply is 10% of the actual total. Thus, 90% of the supply is legal, which gives the actual revenue. \therefore % loss = $[(10/90) \times 100] = 11.11\%$. Hence answer option is d.

Solutions to Questions 8 to 14.

(Monetary values are in Rs. crore unless otherwise mentioned).

8. The Revenue (Income) = Rs. 1350 crore; Expenditure = Rs. 1480 crore. The difference is Rs. 130 crore and as the Expenditure exceeds the Revenue, it is a deficit of Rs. 130 crore. Hence answer option is a.
9. It is very clear that the Sales Tax is the single largest contributor with a 42% share. So the actual contribution = $[(42/100) \times 1350] = \text{Rs. } 567$ crore. Hence answer option is b.
10. A surcharge of 15% will amount to $[(15/100) \times (7/100) \times 1350] \approx \text{Rs. } 14.2$ crore. Hence answer option is b.
11. The rate of surcharge in this case will be in the same ratio as the percentage of Agro. Tax to the percentage of Land Revenue. So we get $(8/12) = (\text{Surcharge}/100)$. So the rate will be 66.66%. Thus the answer is option is d.
12. The expense of 30% of Education = $[(30/100) \times 30\%] = 9\%$ of the total and the expense of 25% of the Health Expenditure = $[(25/100) \times 18\%] = 4.5\%$ of the total. \therefore Together they account for $9+4.5 = 13.5\%$ of the total of Rs. 1480 crore. This is equal to $[(13.5/100) \times 1480] \approx \text{Rs. } 200$ crore. Hence answer option is a.
13. A saving of 20% of the Expenditure on education = $[(20/100) \times 30\%]$ of the total = 6% of 1480 $\approx \text{Rs. } 90$ crore. After equal distribution between roads and health, the addition will be of Rs. 45 crore to each. So roads will now have $[(12\% \text{ of } 1480) + 45] \approx \text{Rs. } 223$ crore. Hence answer option is d.
14. Central grants = 17% of 1350 = 230. Maintenance of highways = 20% of 230 = 46. \therefore The expenditure on the Bombay - Pune Highway = 10% of 46 = 4.6. This amount is 60% of the total amount spent on maintenance. So the total maintenance amount = $[4.6 \times (100/60)] = \text{Rs. } 7.7$ crore. Hence answer option is c.
- Alternate method:**
 $1350 \times (17/100) \times (20/100) \times (10/100) = X (60/100)$,
where X = Amount spent on the maintenance of highways.
So, X = 7.65

Solutions to Questions 15 to 20.

15. The combined production of these four countries in 1950 – 51 = $1.51+0.06+1.25+0.64 = 3.46$; in 1976-77 it is $0.91+0.09+0.98+1.07 = 3.05$. \therefore The percentage change = $[(3.05-3.46)/3.46] \times 100 \approx -12\%$, which is not there in any of the first three options. Hence answer option is c.
16. In 1971-72, non-passenger vehicles = 138.54 and total two-wheelers = 341.88. \therefore The proportion $\approx 140:340 \approx 7:17 \approx 0.41$. Hence answer option is c.
17. From 1950-51 to 1979-80, we have a 30-year period, so the total decrease will be $30/2 = 15$ percentage points [note that the decrease is not 15% of 60%]. So the American vehicles will constitute 45% of the total non-passenger vehicles in 1979-80. In 1950-51, American non-passenger vehicles = $[(60/100) \times 74.4] \approx 45$; in 1979-80 it is $[(45/100) \times 146] \approx 65$. \therefore the difference $\approx 65-45 \approx 20$ million (increase). Hence answer option is c.

18. The question concerns the production over the next decade, while the table gives the production of only two of the next eleven years (1971-72 and 1976-77), so the answer is Indeterminable. Hence answer option is d.
19. In 1971-71, the production of the countries mentioned = $57.43 + 39.99 + 67.72 + 0.94 + 0.07 + 0.99 + 1.11 \approx 168$. \therefore The production of the other countries $\approx 203.34 - 168 \approx 35$. India's production = 15% of the others = $[(15/100) \times 35] = 5.25$ million. Hence answer option is b.
20. Since 40% of the total German passenger cars in 1979-80 were jeeps, the remaining 60% were cars. Thus cars were 60% of the total German passenger cars in 1979-80, i.e. $[(60/100)] \times 41.3 = 24.78$ million. Hence answer option is c.

Exercise - 2(B)

Solutions to Questions 1 to 4.

1. The table gives the market shares of the four products in 1993 and 1994. From the given data, we can see that the market shares of Soap, Deodorant, Perfume and Talc dropped in Mumbai, Calcutta, Mumbai and Madras respectively. It can be seen that the market share of each product has reduced in at least one city. Hence answer option is d.
2. From the given table, it can be seen that the market share of Talc in Calcutta doubled itself from 10 to 20 between 1993 and 1994. As no other product has doubled its market share, only one product has doubled its market share in one or more cities. Hence answer option is b.
3. The market share of Deodorant in Calcutta reduced from 30 to 15 between 1993 and 1994. Therefore, Deodorant showed the maximum decrease of 50% in market shares. Hence answer option is b.
4. No product had a 100% market share in any of the four metros. Hence answer option is a.

Solutions to Questions 5 to 9.

Please note that the graph is a cumulative one. So, to get the values for Maruti Comfort, we have to subtract the values with corresponding values of Maruti Compact. The graph is represented below in a tabular form. Since the values in the graph give the speed in terms of km per 100n seconds, it would be convenient to convert this to conventional units like km/hr or m/s.

	0 km	1 km	2 km	3 km	4 km	5 km	6 km
Compact	0s	100s	200s	300s	200s	200s	200s
Comfort	0s	100s	100s	150s	160s	200s	150s

5. During the 5 km test drive, time taken by Maruti Compact = 200s and time taken by Maruti Comfort = $(400 - 200)s = 200s$. Since, time taken is same \therefore average speeds are also same or their ratio is 1:1. Hence answer option is c.
6. During the 3 km test drive, average speed of Maruti Compact = $3 \times 1000/300 = 10$ m/s and that of Maruti Comfort = $3 \times 1000/150 = 20$ m/s. \therefore required speed = $(10 + 20) = 30$ m/s. \therefore Time taken = $6 \times 1000/30 = 200s$. Hence answer option is b.
7. Let original speed = v kmph. The total time taken = 200s. $\therefore 4/v + 2/(v/2) = 200/3600$ hr or $v = 144$ kmph. Hence answer option is c.
8. Average speed of Maruti Compact over 5 km test drive = $5 \times 1000/200 = 25$ m/s. Average speed of Maruti Comfort over 6 km test drive = $6 \times 1000/150 = 40$ m/s. Average speed of Maruti Comfort over 3 km test drive = $3 \times 1000/150 = 20$ m/s. \therefore The correct sequence is [q], [p], [r]. Hence answer option is d.



9. Average speed of Maruti Compact over 6 km test drive = $6 \times 1000/200 = 30$ m/s. Average speed of Maruti Comfort over 2 km test drive = $2 \times 1000/100 = 20$ m/s. \therefore The required % = $(30 - 20)(100)/(20) = 50\%$. Hence answer option is b.

Solutions to Questions 10 to 12.

10. If we follow a particular route to go from P to U, the activities other than on the route will take place simultaneously, e.g. when activity (P - R) takes place, activities (P - Q) and (P - S) will occur simultaneously and will be completed before (P - R) as their duration is less. So, if we consider the longest route from P to U, all other activities will be completed before the activities on the route are completed. As (P - Q - R - T - U) is the longest route for two wheelers with a total duration of 44 hours, as the time required for two wheelers and the truck are in the ratio 1:3. So the time taken to overhaul a truck is 132 hours. Hence answer option is b.
11. The sum of the duration of all activities for a two wheeler is 110 hours. So, the sum of the duration of all activities for a three wheeler is 220. The normal cost of overhauling a three wheeler is Rs. 22000. As the time required for each activity is reduced by an hour, the sum of the duration of all activities will be 211 hours and the normal cost associated with this duration will be Rs. 21100. The extra cost involved, depending upon whether the activity starts from P, Q or S, can be calculated as follows:

Activity	Duration	Normal Cost	Extra Cost
P - Q	15	1500	150
P - R	19	1900	190
P - S	15	1500	150
Q - R	19	1900	228
Q - U	31	3100	372
S - T	35	3500	525
S - U	27	2700	405

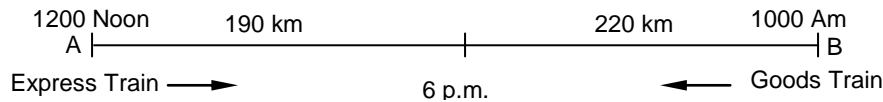
The total extra cost is Rs. 2020. The total cost of overhauling a three wheeler is now Rs. 23120. So, the extra charge incurred in order to obtain the overhauled three wheeler earlier is Rs. 1120. Hence answer option is c.

12. This question is independent of the previous one. There is a reduction of 3 hours for two of the activities, and there is an increase of two hours for two other activities. Thus, the total time reduces by 2 hours. Thus there will be a $[2 \times 100] =$ Rs. 200 decrease in revenue. Hence answer option is a.

Solutions to Questions 13 to 15.

13. The time taken to produce 1 unit of A on M_1 is 15 minutes, while the time required to produce 1 unit of B on M_2 is 12 minutes. Thus, we can manufacture 36 units of A on M_1 and 45 units of B on M_2 . Therefore, the total number of units being manufactured is 81. Hence answer option is b.
14. 35 units of B on M_2 require 420 minutes and 25 units of C on M_1 require 400 minutes. After manufacturing these units, we still have 120 minutes available on M_2 and 140 minutes on M_1 . We can manufacture 9 units of A on M_1 and 6 units of A on M_2 . Therefore, the total number of units of A is 15. Hence answer option is a.
15. To manufacture 12 units of B, we need to manufacture 36 units of A and 24 units of C. To manufacture 36 units of A on M_1 we require 540 minutes and to manufacture 24 units of C on M_2 we require 432 minutes. We are now left with 108 minutes on M_2 . In 108 minutes, we can manufacture 9 units of B on M_2 . We still need to manufacture 3 more units of B. Already, the machines normal time of work has been utilised. Since we are looking for minimum extra machine time, we will produce 1 unit of B in M_1 (which requires a further of 14 minutes) and 2 units of B in M_2 (which require a further of 24 minutes). So, the extra time will be 24 minutes which is $2/5$ th of an hour. Hence, option (c).

Solutions for Questions 16 to 22.



As the distances have been given at hourly intervals, we see that the Express Train (ET) started at 1200 Noon and the Goods Train (GT) started at 1000 AM.

16. By 6 p.m., when the two trains met each other, the GT and the ET had respectively travelled 220 km and 190 km. thus the total distance is $220 + 190 = 410$ km. Hence answer option is (c).
17. The data does not mention a uniform rate of travel. Thus the train could cover the distance of 25 km (of the first hour) in just 20 minutes, say, and halt for the remaining 40 minutes. We just know the total km covered at the end of an hour. So, though we know that from 1 p.m. to 2 p.m. the GT had definitely stopped, we cannot be sure that the exact amount of time for which it stopped is one hour only. It could also have stopped earlier for some time between 1200 and 1 p.m. and started anytime between 2 p.m. and 3 p.m., subsequently covering the distance of 20 km upto 3 p.m. Hence answer option is (d).
18. Average speed = $290 \text{ km} / 9 \text{ hours} \approx 32.2 \text{ kmph}$. Hence answer option is (b).
19. From the first question above, we know that the trains crossed each other at 6 p.m. The distance covered by the GT in its journey thereafter = $(250 - 220) = 30$ km in 1 hour. \therefore Speed = $30/1 = 30 \text{ kmph}$. Hence answer option is (b).
20. We have already obtained the distance between the stations as 410 km, of which 290 km have been covered by the ET. Thus the remaining distance is 120 km. The average speed during the final hour = $(290-240)/1 = 50 \text{ kmph}$. So the time taken = $(120/50) = 2.4$ hours = 2 hours 24 minutes after 9 p.m. Thus the time will be 11:24 p.m. Hence answer option is (c).
21. The time taken upto the end of the day [10 a.m. to 12 midnight] = 14 hours, and the distance covered = 410 km. \therefore the average speed = $410/14 \approx 29 \text{ kmph}$. Hence answer option is (b).
22. The total time period = 3 hours, and the distance during this = $120-60 = 60$ km. At an average speed of 40 kmph, the travel time is $60/40 = 1\frac{1}{2}$ hours, so the time of stoppage = $3 - 1\frac{1}{2} = 1\frac{1}{2}$ hours. Hence answer option is (c).

Solutions to Questions 23 to 30.

The values for the year 1971 only have been given with both, 1960 as well as 1970, as base years. These values can be used for conversion from one base year to the other.

23. Intermediate industries:

'71(1960-base) = 160	'71 (1970-base) = 104
'66 (1960-base) = 137	'66 (1970-base) = X
$160 / 137 = 104 / X$	$X = 104 \times 137 / 160 \approx 90$.

Hence answer option is c.
24. Basic index:

'71(1960-base) = 234	'71 (1970-base) = 105
'81 (1960-base) = X	'81 (1970-base) = 148
$X = 234 \times 148 / 105 \approx 330$.	

Hence answer option is b.
25. To calculate the required percentage increase, the consumer goods indices for '61 and '90 must be obtained on the same scale (either '69 or '70 base).

'71(1960-base) \approx 160	'71 (1970-base) \approx 103.5
'61 (1960-base) \approx 107	'61 (1970-base) \approx X

7. 1994 total sales = Rs. 125 crore; 1996 total sales = Rs. 160 crore; Increase = 35 crore; 1993 total sales = Rs. 95 crore. So $95/35 \approx 2.7$ times. Hence answer option is b.

Solutions to Questions 8 to 14.

8. The supply was approximately 105 billion kWh, while the requirement was 120 billion kWh. So the approximate percentage is $105 \times 100 / 120 \approx 700/8 \approx 87.5\%$. Hence answer option is c.
9. In 1981-82, supply = 115 billion kWh while in 1984-85 supply = 151 billion kWh. So the percentage increase $(151 - 115) \times 100 / 115 \approx 31\%$. Hence answer option is b.
10. Mental calculations will show that the difference between the supply and requirement is the least in 1982-83. So the percentage is also the least for that year because the denominator has a much lesser percentage increase. Hence answer option is c.
11. Requirement of power in 1974-75 = 77.6 billion kWh while in 1984-85 it was 170 billion kWh. So the percentage increase is $\approx (170 - 78) \times 100 / 78 \approx 120 (-)\%$. Hence answer option is a.
12. Since the increase in the requirement of power (numerator) is the least for the period 1979-81, from the given options, with the increase in the denominator remaining very less, the growth during that period (1979-81) must definitely be the least. Hence answer option is b.
13. By visual inspection it is very clear that the greatest addition to power supply was in the period 1983-85. Because slope of the line is steep. Hence answer option is d.
14. The increase in power requirement during 1975-80 was $118 - 83.5 = 35$ billion kWh. The increase in requirement during 1980-85 was $170 - 120 = 50$ billion kWh. So the percentage was $50 \times 100 / 35 \approx 143\%$. Now we can go for answer option (d) as it is the most appropriate answer.

Solutions to Questions 15 to 20.

15. For urban consumers, the per capita expenditure in 1973 and 1983 were, respectively, 64.5% and 59.1%. Thus the percentage decrease = $[(64.5 - 59.1)/64.5] \times 100 = (5.4/64.5) \times 100 \approx 8.4(-)\%$. Hence answer option is a.
16. In 1973, in an urban household, 3.6% of the total expenses was spent on sugar. This is equal to $[(3.6/100) \times 531] = \text{Rs. } 19.12$. Hence answer option is c.
17. In 1978, in rural areas, the amount spent on clothing was 8.7% of 580 $\approx \text{Rs. } 50$. Hence answer option is c.
18. In 1983, the total expenses on food in rural areas were $[(65.6/100) \times 665] \approx [(2/3) \times 665] \approx \text{Rs. } 444 (-)$, while in the urban areas, they were $[(59.1/100) \times 765] \approx [(3/5) \times 765] \approx \text{Rs. } 459 (-)$. Thus the difference is approximately $(459 - 444) \approx \text{Rs. } 15$. Hence answer option is a.
19. In 1973, in rural areas, Oils formed 3.5%, while vegetables formed 3.6%. \therefore The required percentage = $[(3.5/3.6) \times 100] \approx 97\%$. Hence answer option is a.
20. In 1978, in the urban areas, the expenditure on non-food items was 40%, while that on food items was 60%. So the required percentage = $[(40/60) \times 100] = 66\frac{2}{3}\%$. Hence answer is b.

Exercise - 3(B)

Solutions to Questions 1 to 5.

1. The Tedha – Medha Trading Corporation can adopt one of the strategies P, Q or R. Along with the payoffs, the Corporation will also have to incur a certain amount of expenses. So, we can calculate the net payoff for the three strategies as follows.



Strategy	Payoff	Expenses	Net Payoff
P	15000	15000	0
Q	12000	6000	6000
R	15000	17500	-2500

From the table, we can see that Tedha – Medha Trading Corporation should adopt strategy Q for the maximum payoff. Hence answer option is b.

2. We can calculate the net payoff for the different strategies that the Tedha – Medha Trading Corporation can adopt as follows.

Strategy	Payoff	Expenses	Net Payoff
P	21000	15000	6000
Q	-4000	6000	-10000
R	24000	17500	6500

From the table, we can see that Tedha – Medha Trading Corporation's maximum payoff is 6500. Hence answer option is c.

3. From the given table, it can be seen that the Tedha – Medha Trading Corporation's minimum payoff is (-)4000 if the Oolta – Seedha Trading Corporation adopts strategy Q. Hence answer option is b.
4. We have already calculated that if the Oolta – Seedha Trading Corporation adopts strategy Q when the Tedha – Medha Trading Corporation has adopted strategy Q, it will result in the least payoff for the Tedha – Medha Trading Corporation. Hence answer option is c.
5. If both organisations adopt strategy R, The Tedha – Medha Trading Corporation gains 9000, but has to incur an expense of 17500. So, the Tedha – Medha Trading Corporation's net loss is 8500. At the same time, the Oolta – Seedha Trading Corporation loses 9000 and also has to incur an expense of 17500. So, the Oolta – Seedha Trading Corporation's net loss is 26500. Hence answer option is b.

Solutions to Questions 6 to 10.

The graph is represented below in a tabular form;

	0 km	10 km	20 km	30 km	40 km	50 km	60 km
Abhik	20	20	50	50	50	66.7	80
Vaibhav	40	40	40	40	30	50	50
Pravesh	60	60	60	70	58.4	40	40

Use the formulae $s = ut + \frac{1}{2}at^2$ and $v = u + at$.

6. Using the formula $v^2 = u^2 + 2as$, we get $a = (50^2 - 30^2)/(2 \times 10) = 80 \text{ km/hr}^2$. \therefore the time required, $t = (v - u)/a = (50 - 30)/80 = 1/4 \text{ hr}$ or 15 minutes. Hence answer option is a.
7. Zero acceleration simply means at constant speed. From the graph, it is clear that Abhik travelled at constant speed from 0 to 10 km and from 20 to 40 km, Vaibhav from 0 to 30 km and from 50 to 60 km and Pravesh from 0 to 20 km and from 50 to 60 km i.e. a total of $(30 + 40 + 30) = 100 \text{ km}$. Total distance travelled by all three = $(60 + 60 + 60) = 180 \text{ km}$. \therefore required ratio = $100/180 = 5/9$. Hence answer option is c.
8. Time taken by Vaibhav to cover 1st 16 km = distance/speed = $16/40 = 2/5 \text{ hr}$ or 24 min. Now, Pravesh took 20 min to cover 1st 20 km. In the next 4 min, he travelled, $S = [60 \times 1/15] + [\frac{1}{2}(70 - 60) \times 1/15] = 4.33 \text{ km}$. We have, $20 + 4.33 = 24.33$. So the nearest answer is 25 km. Hence answer option is c.

9. Using the formula, $v = u + at \Rightarrow a = (v - u)/t$. Now, $s = ut + \frac{1}{2}at^2$, time taken by Abhik to cover the distance between 10 km and 20 km = $2/7$ hours. Time taken by Vaibhav to cover the distance between 50 km and 60 km = $10/50 = 1/5$ hr. \therefore the required ratio = $(2/7)/(1/5) = 10:7$. Hence answer option is a.
10. Constant acceleration does not mean zero acceleration. We just know the average speed over a particular distance. Whether the speed over this distance changes or not, and if yes, then how it changes, is not mentioned in the data. Hence answer option is d.

Solutions to Questions 11 to 18.

11. In 1967, the expenditure on food in rural areas was 77% of Rs. 85, which is Rs. 65. In 1983, this expenditure became 66% of 175, which is \approx Rs. 115. Thus the increase is \approx Rs. 50. Hence answer option is b.
12. In 1983, let per capita expenditure in rural areas be 100. Then per capita expenditure in urban areas = 110. Thus the per capita expenditure on food in urban areas is 59% of 110 = 64.9. Whereas in rural areas, per capita expenditure on food = 65.5% of 100 = 65.5. So the expenditure is more in rural than in the urban areas. Hence answer option is a.
13. In 1967, the amount spent on clothing in urban areas was 28.4% of 135 = Rs. 40(-), while in 1983, it was 33.3% of 340, which is \approx Rs. 113. Thus the increase per month is \approx Rs. 73(+). So the annual increase $\approx 12 \times 73(+)$ \approx Rs. 890. Hence answer option is d.
14. In 1967, the per capita expenditure on food was 66.66% of 135, which is = Rs. 90, while in 1983 it was 59.1% of 340, which is \approx Rs. 200(+) according to 1983 prices. So at constant (i.e. 1967) prices, it would have been $[(58/100) \times 200] \approx$ Rs. 116(+). So the percentage increase is approximately 30%. Hence answer option is c.
15. In 1967, in the urban areas, the percentage of per capita expenditure on food and clothing together was 95%, while the same in 1983 was 92.4%. So the percentage has decreased by 2.6. Hence answer option is b.
16. It has not been mentioned that office-wear and casual wear are the only types of clothing. We could have other types like children's clothing, sports-wear etc. Thus, all the non-office-wear need not be casual wear, and thus the answer is indeterminable. Hence answer option is d.
17. The monthly expenditure in 1989 would be $30000/12 = 2500$. According to the 1983 pattern for urban areas, Others would form 7.6% of 2500, while education would form 40% of this result, i.e. $[(40/100) \times (7.6/100) \times 2500] =$ Rs. 76. Hence answer option is b.
18. The total expenses for religious purposes have been asked, for which we will have to know the population in urban areas. Since this is not known, the data is insufficient. Hence answer option is d.

Solutions to Questions 19 to 26.

19. Power utilised by the agricultural sector $\approx 18\%$ while power utilised by the industrial and commercial sectors together $\approx 64\%$. So the percentage is $18 / 64 \approx 30$ (-)% or 28 (+)%. Hence answer is b.
20. Domestic sector accounted for 13(+)% of the total of 170 billion kW, which is approximately equal to 22 billion kW. And answer has to be greater than this value. Hence answer is b.
21. In 1980-81, the industrial sector accounted for $\approx 59\%$ of 120 billion kW while in 1984-85 it accounted for 55 (+)% of 170 billion kW. So the increase is $93.5 - 71 \approx 22.5$ billion kWh. Hence answer is b.



22. In 80-81, domestic consumption was 11% of 120 billion kW while in 1984-85 it was 23 billion kW (from solution of Q 20). So the percentage increase is $(23 - 13.2) \times 100 / 13.2 \approx 980/13.2 \approx 70\%$. Hence answer is d.
23. Agricultural sector in 1970-71 was 10 (+)% of 61.2 billion kWh, while in 1984-85 it was 19 (-)% of 170 billion kWh. So the increase in consumption is approximately $33 - 6.2 \approx 26.8$ billion kWh. So the increase is about $26.8/6.2 \approx 4.2$ times. Hence answer is a.
24. Railway sector in 1970-71 was 3(+)% of 61.2 billion kWh while in 1984-85 it was $\approx 2.5\%$ of 170 billion kWh. So the increase in consumption was $4.25 - 1.9 \approx 2.35$ billion kWh which is 2350 million kWh. Hence answer is b.
25. Commercial sector in 1970-71 was 6% of 61.2 billion kWh, while in 1980-81 it was 6% of 120 billion kWh. So the percentage increase is $\{[(6\% \text{ of } 120) - (6\% \text{ of } 61.2)] / (6\% \text{ of } 61.2)\} \times 100 \approx 100\%$. Hence answer is d.
26. These units constitute 30% of the 4 (-)% contributed by others from a total of 170 billion kWh, which is approximately 1.2 % of 170 = 2.04 billion kWh. Paying @ Rs. 1.25/kWh, the revenue generated is $(2 \times 1.25) = \text{Rs. } 2.55 \text{ billion} = \text{Rs. } 255 \text{ crore}$. Hence answer is c.

Solutions to Questions 27 to 30.

27. To find the maximum number of units, we will have to consider the minimum time required to manufacture X, Y and Z. The lesser the time, the more will be the number of units manufactured. As there is no condition on the type of units to be manufactured, we can consider only those units which require the least time on the two machines. X requires minimum time on M_1 and Y requires minimum time on M_2 . We have a total of 720 minutes available on each machine. As X requires 15 minutes on M_1 , we can manufacture 48 units of X on M_1 with no idle time. As Y requires 18 minutes on M_2 , we can manufacture 40 units of Y on M_2 with no idle time. Therefore, the maximum total number of units that can be manufactured in a day is 88. Hence answer is b.
28. 35 units of X on M_1 require 525 minutes and 30 units of Z on M_2 require 720 minutes. After manufacturing these units, we still have 195 minutes available on M_1 . Y requires 20 minutes on M_1 . Therefore, the maximum number of units of Y that can be manufactured is 9. Hence answer is a.
29. X is produced on M_1 and (Y and Z) are produced on M_2 . So after every 42 minutes, a set of 1 unit each of X, Y and Z are ready. In same way we can produce 17 units each of X, Y and Z. Total time required is 714 min.
Now 18th unit of X can be produced on M_1 taking 9 extra minutes and 18th unit of Y and Z can be produced on M_2 using 36 extra minutes. After this M_1 can be switched off and remaining 2 units each of X, Y and Z can be produced on M_2 taking 140 extra minutes.
Total extra machine hour = $140 + 36 + 9 = 185 \text{ min}$. Hence answer is c.
30. We can manufacture 48 units of X on M_1 and 30 units of Z on M_2 . Therefore, the maximum number of units that can be manufactured is 78. Hence answer is b.

Exercise - 4(A)

Solutions to Questions 1 to 7.

1. Family X has savings of 13%, while Family Y has a savings of 15%. So the difference in the percentage of savings is 2. Hence answer option is c.
2. Family X has savings of 13% of its income of Rs. 2400 which is Rs. 312. Family Y has savings of 15% of its income of Rs. 1800 which is Rs. 270. So the difference in their savings is Rs. 42. Hence answer option is b.

3. Family X spends 10% on repayment of loans in a month. So the annual amount will be $12 \times (10\% \text{ of } 2400)$ which is Rs. 2880. Hence answer option is d.
4. Family X's travel expenditure is 9% of 2400 while family Y's travel expenditure is 8% of 1800, which are 216 and 144 respectively. So the percentage difference is $= 72 \times 100 / 144 = 50\%$. Hence answer option is b.
5. The combined expenditure on entertainment was 3% of 2400 and 8% of 1800 which totals up to $72 + 144 = \text{Rs. } 216$. Hence answer option is d.
6. Since clothing constitutes 12%, the angle will correspond to $12 \times 3.6 = 43.2^\circ$. Hence answer option is c.
7. By checking out the options and looking at the bar graphs, Family Y has just slightly greater values than Family X for food, misc and rest. For the spending to be double, Family Y's percentage share must be more than double that of Family X, which is satisfied only by "entertainment". Refer to solution of Q5. Hence answer option is b.

Solutions to Questions 8 to 14.

8. In 1969, number of rural bank branches = 1832. In 1977, number of rural bank branches = 9532. So the increase is exactly 7700. Hence answer option is c.
9. It is evident looking at the line graph that rural branches have shown the maximum growth in number. Hence answer option is a.
10. The increase of 504 from 1973 to 1974 is the least for rural branches from the given options. Hence answer option is b.
11. Since the number of rural branches is the least in 1969, and it has had the maximum growth after that, it forms the least proportion of the total in 1969. Hence answer option is a.
12. The difference in the number of branches in cities from 1974 to 1977 is $3796 - 2783 = 1013$. Hence answer option is a.
13. The growth in number of semi-urban branches from 1969 to 1973 was $4723 - 3322 = 1401$. The growth in total number of branches from 1969 to 1973 was $15362 - 8262 \approx 7100$. So the percentage increase is $1400 \times 100 / 7100 \approx 20 (-)\%$. Hence answer option is a.
14. By visual inspection it is evident that the growth in number is least for cities. Hence answer option is d.

Solutions to Questions 15 to 20.

Calculate the total population in 1981 as $343.93 + 321.36 = 665.29$.

15. The approximate ratio of males to females is 345 : 325. So from a total population of 670, 325 are females. So the number of females in every 1000 of the population is obtained by $325 \times 1000 / 670 \approx 325 \times 3 / 2 \approx 480 (+)$. Hence answer option is d.
16. Those aged 50 or above total to $14 + 11.5 + 8.5 + 8 + 9.5 + 8.75 + 12.75 + 12.5 \approx 85.5$. So the percentage of the total that they form is $85.5 \times 100 / 665.3 \approx 1 / 8 (-) \approx 13\%$. Hence answer option is d.
17. Those born in British India would mean those born before 1947. Hence they would be aged 34+ in 1981. So the total of those below 34 years is approximately equal to the sum $91 + 87 + 45 + 40.5 + 34 + 30 + 29 + 28 + 26 + 25 + 21.5 + 21 \approx 478$. So the remaining is approximately $665.3 - 478 \approx 185+$. So the percentage will be $185 \times 100 / 670 \approx 30 (-)\%$. Hence answer option is c.



18. Using data from the above solution, the population below the age of 30 will be $\approx 478 - 43 \approx 435$. The female population is approximately $87+40.5+30+28.5+25 \approx 211$. So the approximate percentage will be $211 \times 100 / 435 \approx 50(-)\% \approx 48\%$. Hence answer option is c.
19. Its not possible to determine what age consititues teenagers. So the answer is "Insufficient data". Hence answer option is d.
20. From 665 million the population increased to 843 million. So the percentage increase was $(843 - 665) \times 100 / 665 \approx 25 (+)\%$. Hence answer option is c.

Exercise - 4(B)

Solutions to Questions 1 to 4.

1. The sales per rupee of share capital for the years 1991, 1992, 1993 and 1994 can be calculated as $3270/98 = 33.36$, $2620/98 = 26.73$, $4725/205 = 23.04$ and $6435/310 = 20.75$ respectively. Therefore, the sales per rupee of share capital was the highest in 1991. Hence answer option is a.
2. As each year's Retained Earnings are added to the Reserves, the Reserves at the end of 1990, 1991, 1992, 1993 and 1994 are 80, 220, 290, 535 and 935 respectively. The percent addition to reserves over the previous years reserves for the years 1991, 1992, 1993 and 1994 can be calculated as $140/80$, $70/220$, $245/290$ and $400/535$ respectively. Comparing the values involved in the calculations, we see that except in 1991, all other calculations have Numerator < Denominator. Therefore, 1991 showed the highest percentage addition to reserves over the previous year's reserves. Hence answer option is a.
3. The tax is calculated as $PBT - (\text{dividend} + RE)$. The amount of tax for the years 1991, 1992, 1993 and 1994 are 145, 70, 220 and 280 respectively. So, the tax per rupee of profit before tax can be calculated as $145/315 = 0.46$, $70/170 = 0.411$, $220/525 = 0.419$ and $280/790 = 0.354$ respectively. Therefore, the tax per rupee of profit before tax was the lowest in 1994. Hence answer option is d.
4. The profit before tax per rupee of sales for the years 1991, 1992, 1993 and 1994 can be calculated as $315/3270 = 0.096$, $170/2620 = 0.064$, $525/4725 = 0.111$ and $790/6435 = 0.122$ respectively. Therefore, the profit before tax per rupee of sales was the highest in 1994. Hence answer option is d.

Solutions to Questions 5 to 7.

5. To find the maximum number of units, we have to consider the minimum time required to manufacture X, Y and Z. The lesser the time, the more will be the number of units manufactured. As there is no condition on the type of units to be manufactured, we can consider only those units which require the least time on the two machines. Units of Y require the least time on both machines. So, manufacturing only units of Y will result in the maximum number of units being manufactured in a day. A unit of Y requires 12 minutes and 9 minutes on the machines M_1 and M_2 respectively. So, we can manufacture $600/12=50$ units of Y on M_1 and $600/9 = 66$ units of Y on M_2 . Therefore, the maximum number of units being manufactured in a day is 116. Hence answer option is c.
6. As we are interested in manufacturing units of X and Z only, we will have to consider the minimum time it takes to manufacture these units. Units of X require minimum time on M_1 while units of Z require the same time on M_1 as well as M_2 . So, we will have to manufacture units of X on M_1 and units of Z on M_2 . As a unit of X requires 14 minutes on M_1 , we can manufacture $600/14 = 42$ units. As a unit of Z requires 15 minutes on M_2 , we can manufacture $600/15 = 40$ units. Therefore, the maximum number of units that can be manufactured is 82. Hence answer option is b.

7. To manufacture one unit each of X, Y and Z, we require 41 minutes on M_1 and 42 minutes on M_2 . So, in 10x60 mins, on each machine, we can prepare 14 units of each X, Y and Z. So, efficiency of each of the machines is equal. The fractional part is to be discarded, hence 1:1. Answer option is (a)

Solutions to Questions 8 to 10.

8. The minimum duration of the project is the duration of the longest route from A to F. As (A - C - E - F) is the longest route, the duration of the project is $5 + 7 + 8 = 20$ days. Hence answer option is a.
9. The sum of the duration of all activities is 35 days. So, the regular cost of the project is Rs. 1750. Now, the duration of activities (C - E) and (E - F) has been reduced to 6 and 7 days respectively. The sum of the duration of all activities is now 33 days and the regular cost associated with this duration is Rs. 1650. The additional cost is $(150 \times 6) + (150 \times 7) =$ Rs. 1950. The total cost of the project is now Rs. 3600. So, the cost of the project has gone up by Rs. 1850. Therefore, the percent change in the cost to the Corporation is $1850/1750 = 105\%$. Hence answer option is b.
10. Since the total duration has reduced by 7 days, the sum of the duration of all activities is $[35-7] = 28$ days. So, the regular cost of the project is Rs. 1400. The additional cost is $(150 \times 3) + (150 \times 3) =$ Rs. 900. So, the total cost of the project is now Rs. 2300 and the additional cost forms $(900/2300) \times 100 = 39\%$ of the total cost of the project. Hence answer option is d.

Solutions to Questions 11 to 15.

The table gives the timings at various stages of the race. Please note that after every 60 km, they stop for 10 minutes for refuelling.

11. Actual running time taken by R1 to cover the 1st 150 km = $(11.30 - 9.00) - 20$ min (for two stoppages) = 2 hrs 10 min = 130 min. Actual running time for R3 to cover the last 90 km = $(14.59 - 13.40) - 10$ min (for one stoppage) = 1 hr 9 min = 69 min. \therefore the required time difference = $(130 - 69) = 61$ min. Hence answer option is b.
12. We know that distance remaining constant, speed is inversely proportional to time. Time taken by R1 to cover between 210 and 300 km = $90 - 10 = 80$ minutes. Time taken by R2 to cover distance between 210 and 300 km = $95 - 10 = 85$ minutes. \therefore the required ratio = $85:80 = 17:16$. Hence answer option is b.
13. R1 covered the distance between 300 and 360 km in $(14.45 - 14.00) = 45$ min. Running time = $45 - 10 = 35$ min. R2 covered the distance between 240 and 330 km in $(14.30 - 13.00) = 90$ min. Running time = $90 - 20 = 70$ min. \therefore required ratio = $35/70 = 1:2$. Hence answer option is a.
14. Again distance remaining constant, speed is inversely proportional to time. Time taken by R1, R2 and R3 respectively to cover the last 60 km are 25, 30 and 28 min. \therefore required ratio is $1/25:1/30:1/28$ or $84:70:75$. Hence answer option is c.
15. As the overall running time remains the same, the loser will still be R3. Hence answer option is c.

Solutions to Questions 16 to 22.

16. The difference will be $(38 - 7)\%$ of 8.5 million = 2.635 million = 26.35 lakhs. Hence answer option is b.
17. The difference in the percentage shares of the spendings is $27 - 9 = 18\%$ of 64 crore. $0.18 \times 64 =$ Rs. 11.52 crore Hence answer option is a.
18. Canara bank has an 8% share = $0.08 \times 8.5 = 6.8$ lakh. Hence answer option is c.



19. Since Mahacard accounts for 30%, the remaining cards account for 70% of the others, which accounts for 25% of the Rs. 64 crore spendings. So $0.7 \times 0.25 \times 64 = 11.2$ crore. Hence answer option is b.
20. Bank of Baroda accounts for 12% of the total spendings of Rs. 64 crore, which is 0.12×64 . Card efficacy = 30% i.e. for every Rs. 100 spent Rs. 30 is spent by using the card. So the total purchase = $0.12 \times 64 \times 100 / 30 = \text{Rs. } 25.6$ crores. Hence answer option is b.
21. Let every American Express cardholder spend Rs. 2. Every second American Express cardholder also owns a Citibank card and spends equally with both cards. So from every Rs. 2 spent; Re.1 is spent by each card.
So for every two cardholders a total of Rs. 4 spent means that Rs. 3 is spent by using the American Express card and Re.1 is spent by using the Citibank card. So the spendings are in the ratio 3:1 from a total of 4.
The American Express cardholders accounted for 10% of the total spendings of Rs. 64 crore i.e. Rs. 6.4 crore. But this is the 3 parts spent using the American Express card. The remaining 1 part is spent using the Citibank card. So the total of 4 parts corresponds to an actual of $6.4 \times 4 / 3 = 8.533$ crore. Hence answer option is a.
22. Family members will spend Rs.4 if Rs.10 is spent by the original cardholder. So the family members effectively account for 4 out of a total of 14 parts. So the money spent by the family members is (9% of Rs. 64 crore) $\times 4 / 14 \approx 1.65$ crore. Hence answer option is c.

Solutions to Questions 23 to 30.

23. The achieved widening was $852 + 323$ km, while the target was $1076 + 604$. So the percentage of work achieved was $1178 \times 100 / 1680 \approx 70\%$. Hence answer option is b.
24. The length of work on bridges means in km, but that isn't the mentioned unit. So the answer Indeterminable. Hence answer option is d.
25. Strengthening of weak 2 lanes was done for 3717 km, while widening of the 2 lane roads is not known. (Widening of 2 lane roads is different from widening to 2 lanes, which is given). Hence data insufficient. Hence answer option is d.
26. The difference $326 - 303 = 23$ means that there were 23 railway overbridges. The rest 303 were minor bridges. So the ratio of overbridges to the other minor bridges is $23 : 303 \approx 3 : 40$. Hence answer option is d.
27. Since some of the targets are in km while the others are in "number of bridges", we cannot convert all of them into any single unit, and so the answer Indeterminable. Hence answer option is d.
28. The answer is indeterminable because how much part of the Bombay Pune highway has been widened to 4 lanes is not known and hence cost can't be calculated. Hence answer option is d.
29. Length of bypasses to be repaired / Number of major Bridges to be repaired $\times 100$
No. of major bridges repaired / Length of bypasses repaired
 $= \{(14 / 3) \times (11 / 54)\} \times 100 = (154 / 162) \times 100 \approx 95\%$. Hence answer option is a.
30. Let the total investment be Rs. 100. State government's share = Rs.15; International loans = Rs.50. But $1\$ = \text{Rs. } 36$. So the international loans (in $\$$) = $50/36$, hence the ratio becomes $15 \times 36 / 50 = 10.8$. Hence answer option is b.

Exercise - 5(A)

Solutions to Questions 1 to 6.

1. Since the urban population accounts for 25.7% of the total population and the urban population is 217 million, the total population will be $217 \times 100 / 25.7 \approx 845$ million. Hence answer option is b.
2. The total population is 845 million and the urban population is 217. So the remaining will be the rural population; $845 - 217 \approx 628$ million. So the answer is $628 - 217 = 411$. Hence answer option is c.
3. Though we know the number of cities, we do not know the population of each city nor do we know the distribution of population. So the answer is 'indeterminable'. Hence answer option is d.
4. The nearest answer to the ratio of 14:17:23 is 1: 1.2 : 1.6. Hence answer option is c.
5. 22% of 4689 towns and cities are in U.P and Maharashtra $\approx 22 \times 47 = 1034$. The number of cities in these two states is $27 + 42 = 69$. So $69 \times 100 / 1034 \approx 6.7\%$. Hence answer option is b.
6. The total number of cities in those 7 states having more than 20 cities are 194. So $194 / 7 \approx 27.7$. Hence answer option is b.

Solutions to Questions 7 to 13.

Please keep in mind that the given graph is a Band Diagram. Since data labels have been provided in the graph, we have directly used the actual values (i.e. after taking the difference) in the solutions. The population is in millions and weights of goods are in kgs.(1 tonne = 1000 kg).

7. The total consumption is given by the product of the per capita consumption and the population. In 1980-81, for sugar we get $7.2 \times 685 = 4932$ million kg = 4.932 million tonnes. Hence answer option is c.
8. From the given list of items, all items except electricity are "concrete" items. Since the item with the largest percentage increase has been asked, compare the 1984-85 figures of a commodity with its 1950-51 figures. For sugar, we see that the 1984-85 value is about 3.5 times its 1950-51 value, which is the highest percentage increase. Hence answer option is c.
9. In 1970-71, the edible oil consumption = $550 \times 3.5 = 1925$, while in 1980-81 it is $685 \times 3.8 = 2603$. So the increase = $2603 - 1925 = 678$ million kg = 0.678 million tonnes. Hence answer option is c.
10. In 1970-71, the cloth consumption was $550 \times 15.6 = 8580$, while in 1980-81 it was $685 \times 14.7 = 10070$. So the increase = $10070 - 8580 = 1490$ million metres. Hence answer option is b.
11. In 1960-61, the total population was $0.8 \times 550 = 440$. \therefore The total consumption in kWh = $440 \times (27.1 - 23.7) = 440 \times 3.4 = 1496$ million kWh. Hence answer option is a.
12. The consumption of cloth in 1960-61 was $440 \times 15 = 6600$ while in 1970-71 it was $550 \times 15.6 = 8580$. So the percentage increase = $[(8580 - 6600) / 6600] \times 100 = 1980 / 66 = 30\%$. Hence answer option is d.
13. The Vanaspati consumption in 1950-51 was $360 \times 0.5 = 180$, while in 1980-81 it was $685 \times 1.2 = 822$. So the increase = $822 - 180 = 642$ million kg = 0.642 million tonnes. Hence answer option is b.



Solutions to Questions 14 to 20.

14. Since the urban population forms 25.7% of the total population of 84.5 crore, the urban population is $84.5 \times 25.7 / 100 \approx 21.7$ crore = 217 million. Hence answer option is c.
15. Since 65% of the urban population live in the given cities, 35% do not live there. So 35% of the total urban population of 217 million = $0.35 \times 217 \approx 76$ million. Hence answer option is d.
16. The urban population in the 298 mentioned centres is 65% of the total urban population of 217 million. So this is $\approx 217 \times 0.65 \approx 141$ million. The 2 cities have a population greater than 100 lakh but less than 110 lakh each. So taking an average of 105 lakh per city; the total for the 2 cities is 210 lakh = 21 million. So on an average, $21 \times 100 / 141 \approx 15$ (-)%. The answer is 14% – 16%. Hence answer option is c.
17. The population of these cities/centres is not known. So obviously we cannot determine the answer. Hence answer option is d.
18. The number of cities between the 10 and 20 lakh population is 14. The number of cities having a population of 2 lakh is $298 - 166 = 132$. So $14 \times 100 / 132 \approx 10.5\%$. Hence answer option is a.
19. The answer is indeterminable because the distribution of the rural and urban population for the year 1981 is not known. Hence answer option is d.
20. The number of cities in the even number category is 93 (above 2 lakhs, 4 lakhs, 6 lakhs, 8 lakhs, 10 lakhs, 20 lakhs, 100 lakhs and so on). The remaining 205 are in the odd number category. So the ratio of odd number to even number cities is 205 : 93. This is slightly greater than 2. So the nearest ratio is 11 : 5. Hence answer option is c.

Exercise - 5(B)

Solutions to Questions 1 to 5.

The information in the question gives the relationship between distance and time for the three trains.

1. By visual inspection, we find that the coefficients of t as well as t^2 for Indrayani Express are the greatest. \therefore For a constant distance, the Indrayani Express will take the least time. Hence answer option is b.
2. Distance travelled by Deccan Exp. in the 3rd hour = (distance travelled by it in three hours) - (distance travelled by it in two hours) = $(30 \times 3 + 12 \times 3^2) - (30 \times 2 + 12 \times 2^2) = 90$ km. Distance travelled by Singhgarh Express during 1st hour = $(19 \times 1 + 1^2) = 20$ km. \therefore the required ratio = 90:20 = 9:2. Hence answer option is b.
3. Indrayani Express follows the equation $S \text{ km} = 36t + 16t^2$ or $36t + 16t^2 = 70$ which gives $t = 5/4$ hr or 1hr 15 min. So, it will reach Karjat by $(9.40 + 1.15) = 10.55$ a.m.
Alternatively: Try eliminating the answer options. For example option (a), $10:40 - 9:40 = 1$ Hrs. If we substitute $t = 1$ in the expression, $36t + 16t^2 = 70$; it is not satisfying the condition, similarly can be checked for the remaining answer options. Hence answer option is b.
4. In this question, Indrayani Express follows the equation $S \text{ km} = 17t + 9t^2$ or $17t + 9t^2 = 70$ which gives $t = 2$ hours. So, it will reach Karjat at $(9.40 + 2) = 11.40$ a.m. Hence answer option is c.
5. Distance travelled by Deccan Express during 1st hour = $(30 \times 1 + 12 \times 1^2) = 42$ km. \therefore time taken by Singhgarh Express to cover 42 km is calculated by solving the equation $42 = 19t + t^2$ which gives $t = 2$ hours. Hence answer option is c.

Solutions to Questions 6 to 13.

6. The total assets in 1980-81 were $(2364 + 11110 + 226 + 56) = 13756$, and in 1985-86, they were $(1564 + 21328 + 246 + 12) = 23150$. \therefore The combined total = $13756 + 23150 = \text{Rs. } 36906$ crore. Hence answer option is b.
7. Let the value of the other bullion be y . \therefore The gold coins are valued at $1.25y$. \therefore In 1980-81, we have, $1.25y + y = 226$. $\therefore y = 226/2.25 \approx \text{Rs. } 100(+)$ crore. Hence answer option is a.
8. In 1950-51, the ratio was $478/687 \approx 480/690 \approx 16/23 \approx 1/1.50 (-)$. So the closest answer is 1:1.44. (Here in this question we can also go by eliminating answer options. We need to find ratio $478 : 687$. It's obvious that ratio is smaller than 1, we can eliminate answer options a and c, and need to check for b and d only.). Hence answer option is b.
9. In 1970-71, the total assets were $(273 + 3714 + 183 + 52) = 4222$, of which Rupee Securities constituted 3714. If $4222 \equiv 360^\circ$, then $3714 \equiv [(3714/4222) \times 360]^\circ \approx [(3700/4200) \times 360]^\circ \approx 37 \times 60 / 7 = 5.3 \times 60 = 318^\circ$. So the best answer is 317° . i.e., option (b).
10. The area of any such circle (A) will be proportional to the square of its radius (r). We thus get, $[A_1/A_2] = [r_1/r_2]^2$. From the given data, for 1950-51, $A_1 = 1259$ and $r_1 = 1$ cm. \therefore For 1985-86, when $A_2 = 23150$, $(r_2)^2 = (1)^2 [23150/1259] \approx 23200/1260 \approx 580/32 \approx 18$. Thus, $r_2 = (18)^{1/2}$, i.e. r_2 lies between 4 cm and 5 cm. Hence answer option is c.
11. In 1950-51, the percentage was $[(40/1259) \times 100] \approx 3.17\%$. By 1985-86, it came down to $[(246/23150) \times 100] \approx 1.06\%$. \therefore The percentage reduction = $[(3.17-1.06)/3.17] \times 100 \approx (2/3) \times 100 \approx 67\%$. Hence answer option is b.
12. Since the assets are equal to the liabilities, 92% of the liabilities = 92% of the assets (in 1970-71) = $[(92/100) \times 4222] = 3884$. No option is equal or even close to this value, so the answer is (d) "None of these".
13. In 1980-81, the Foreign Securities were worth Rs. 2364 crore. Since 1 rupee = 17 USD, the worth of Foreign Securities in USD terms = $2364/17 \approx \text{USD } 139$ crore = USD 1.39 billion. Hence answer option is a.

Solutions to Questions 14 to 21.

14. In the question, the phrase 'medical purposes' is nowhere defined. So getting an answer is not possible. Hence answer option is d.
15. Since fragrance cannot be directly associated to body odour, the answer is Indeterminable. Hence answer option is d.
16. Cleansing action was cited as a purpose by around 17% of the 851 people; which is around $851 \times 0.17 \approx 145$. So the answer is (d) none of these.
17. Since word of mouth is similar to recommendation, the percentage for trial is 19 and the percentage that used it because of word of mouth is 14. So the required percentage is $(14/19) \times 100 \approx 73.7\%$. So the answer is (d) "None of these".
18. We cannot determine how many people were foreign returned. It is possible that even those who are not in the category "used it abroad" are foreign returned. So answer is (d).
19. We definitely cannot determine how many people are first time users of the liquid soap. Users under the category "New to market" and "word of mouth" are definitely first time users. But nothing can be said about those under "advertising" category. Hence answer option is d.
20. We cannot determine how many people were stingy, miserly and not ready to spend. Hence answer option is d.



21. Since smaller size and sachets are packaging attributes, and these form (8+15)% of the total of 550, the answer is $0.23 \times 550 \approx 126$. Hence answer option is a

Solutions to Questions 22 to 26.

The graph gives data for time and distance for the three contestants. We know that (speed \times time) = distance. Also, remember the formula $s = ut + \frac{1}{2}at^2$ where a is acceleration, t is time and u is initial velocity. The graph is represented in a tabular form below :

	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
A	15	15	12	12	10	8	10	8	8	8
B	12	12	12	12	12	10	8	6.6	6.6	6.8
C	8	8	8	12	18	12	12	12	10	10

22. Time taken by A to complete the race = 110 min. Time taken by B to complete the race = 97 min. Time taken by C to complete the race = 110 min. Earlier, time taken by B to cover 1st 30 km = 36 minutes. Now, time taken by B to cover 1st 30 km = 30/40 hr = 45 minutes. \therefore B will require (45 - 36) = 9 minutes more to finish the race. So, B will complete the race in (97 + 9) = 106 minutes. \therefore B will still win the race. Hence answer option is b.
23. We know that $s = ut + \frac{1}{2}at^2$. \therefore Acceleration = $2 \times (100)(60)^2 / (110)^2 \text{ km/hr}^2 = 60 \text{ km/hr}^2$. \therefore final velocity = $u + at = 0 + (60)(110)/(60) = 110 \text{ kmph}$. Hence answer option is b.
24. B completed the race in 97 minutes whereas A & C completed in 110 minutes. \therefore B can give both a start of (110 - 97) = 13 minutes for the race to end in dead heat. Hence answer option is d.
25. Average velocity = Total distance covered / Total time taken = $(100)(60)/(110) = 55 \text{ kmph}$. Hence answer option is c.
26. Speed of A between 20 km and 40 km = distance/time = $20/24 = 5/6 \text{ km/min}$. Speed of B in between 40 to 70 km = distance/time = $30/30 = 1 \text{ km/min}$. Speed of C in between 70 to 90 km = distance/time = $20/22 = 5/5.5 \text{ km/min}$. \therefore the correct order is p, r, q. Hence answer option is d.

Solutions to Questions 27 to 30.

Analysing the given data, we can obtain the values (in Rs. lakh) for the sales, expenses and profits of the four farms as follows.

	AG	BF	CG	DA
Sales	10	12	12	6
Expenses	9	9.6	10	4
Profit	1	2.4	2	2

The questions 27 – 30 can be answered with the help of the above table.

27. Hence answer option is d.
28. Hence answer option is b.
29. Hence answer option is c.
30. Hence answer option is a.

Exercise - 6(A)

Solutions to Questions 1 to 7.

1. 1991-92 production of 1210's = 20576 1996-97 production of 1210's = 58640. Increase = $58640 - 20576 / 20576 \approx 38000 / 20500 \approx 1.8 (+)$ times. Hence answer option is c.
2. Cars in 1991-92 = 8411 Cars in 1996-97 = 12200. Percentage increase = $(12200 - 8411) \times 100 / 8411 \approx 3800 \times 100 / 8400 \approx 45\%$. Hence answer option is c.
3. Total production increase from 1991-92 to 1993-94 = $108422 - 50825 \approx 57600$. Total production increase from 1993-94 to 1996-97 = $146220 - 108422 \approx 37800$. Percentage = $378 \times 100 / 576 \approx 200 / 3 \approx 66\%$. Hence answer option is c.
4. Increase in production of LCV's from 1991-97 = $44230 - 6462 \approx 37800$. Increase in production of 1210's = $58640 - 20576 \approx 38000$. So the approximate ratio is 1:1. Hence answer option is b.
5. The total production of 1313's, 2416's and MCV's in 1992-93 $\approx 9800 + 3300 + 4100 \approx 17200$. The total production of 1313's, 2416's and MCV's in 1996-97 $\approx 11250 + 6200 + 8350 \approx 25800$. Total increase in production = $25800 - 17200 \approx 8600$. Hence answer option is a.
6. The increase in production of Estates from 1991 to 1997 = $2670 - 1719 \approx 950$. The increase in production of cars from 1991 to 1997 = $12200 - 8411 \approx 3800$. Percentage = $950 \times 100 / 3800 \approx 100 / 4 = 25\%$. Hence answer option is a.
7. The increase in total production from 1993-94 to 1994-95 = $129589 - 108422 \approx 21150$. The increase in total production from 1991-92 to 1992-93 = $82018 - 50852 \approx 31150$. Percentage of increases = $21150 \times 100 / 31150 \approx 2/3 \approx 66\%$. Hence answer option is c.

Solutions to Questions 8 to 15.

8. An overall deficit (when total expenditure was greater than revenue) was only in the year 1985-86. Hence answer option is a.
9. Surplus is the difference between revenue and total expenditure, when revenue is greater than expenditure. From the given options the difference is greatest for the year 1993-94. Hence answer option is b.
10. In 1991-92, depreciation = 76.85 while the revenue was 1070.6. So the percentage that depreciation forms is $76.85 \times 100 / 1070.6 \approx 7.5(-)\%$. Hence answer option is b.
11. 1990-91 revenue = 910; 1995-96 revenue = 1880. So the percentage increase in the revenue = $(1880 - 910) \times 100 / 910 \approx 105(+)\%$. Hence answer option is c.
12. By checking out the options, we can get the answer as 1994-95 to 1995-96, which is just greater than the previous option. Hence answer option is d.
13. The surplus in 86-87 ≈ 100 ; the surplus in 95-96 ≈ 122 . So the approximate percentage increase is 22%. Hence answer option is d.
14. If we ignore depreciation, surplus is the difference between revenue and cash expenditure which, for 1992-93 is, $1290 - 1030 \approx 260$ crore. Hence answer option is b.
15. The total expenditure of 1993-94 was 1286 crore which was approximately equal to the revenue of the previous year - 1290 crore.
Net profits for yrs 1999, 2000 and 2001 are Rs 280.3 cr, Rs 506.12 cr and Rs 856.42 cr
Hence answer option is c.



Solutions to Questions 16 to 20.

16. Net profit in the year 2000 = $1170.56 - (32.5 + 542.4 + 89.54) = 506.12$ crores.
Similarly for the year 2001, net profit = 856.42 crores.
% increase in profits = $[(856.42 - 506.12) / 506.12] \times 100 = 69\%$. Hence answer option is d.
17. Attrition Rate is nothing but the ratio of number of employees leaving the company in the given year to total no of employees at the start of the year .
No. of employees leaving the company = $(5624 \times 30) / 100 = 1686$
No. of new employees joining in 2001 = $(6478 - 5624) + 1686 = 2540$
Engineers = $2540 / 2 = 1270$. Hence answer option is a.
18. No. of shares = $\frac{\text{Share Capital}}{\text{face value}} = \frac{41.3}{5} = 8.26$ crores

Net profit per share = Net profit in 2001 (from Q.No 16) / No. of shares
= $856.42 / 8.26 = \text{Rs. } 103.68$ crores. Hence answer option is a.
19. $389 + (280.3 - 9.08) + (506.12 - 16.52) = \text{Rs. } 1150.52$ cr Hence answer option is c.
20. Profit % is always calculated on total expenses. Total expenses are not known, hence can't be determined. Hence answer option is d.

Exercise - 6(B)

Solutions to Questions 1 to 3.

1. The cost of one bottle can be calculated as $5(3^2 + 3^2 + 5^2 + 4^2 + 3^2 + 3^2 + 4^2) = \text{Rs. } 465$. As the project involves a total of 800 bottles, the cost of the project is $[800 \times 465] = \text{Rs. } 372000$. Hence answer option is b.
2. The percent profit is $45/465 \approx 10\%$. Hence answer option is b.
3. After the duration of activities is reduced, the average cost of a bottle is $5(2^2 + 3^2 + 2^2 + 3^2 + 2^2 + 4^2 + 2^2) = \text{Rs. } 250$. The extra cost involved can be calculated as follows:

Activity	New duration	Extra cost
U - V	2	120
X - Z	2	120
Y - Z	2	120
V - X	3	405
W - X	2	120
	Total	885

The total extra cost is Rs. 885 and the total cost per bottle is Rs. 1135. So, the firm sells each bottle at Rs. 625 less than its cost, thus making a loss of $625/1135 = 55\%$. Thus the profit will be (-55%) . Hence answer option is d.

Solutions to Questions 4 to 6.

Suppose Radhika had a total property of X. As each son gets an equal share in the property, each gets $0.25X$. The first son gets 20% of the total property and Rs. 60000 in cash. This should together comprise 25% of the total property. Equating these values, $0.2X + 60000 = 0.25X$, we can obtain Radhika's total property as $X = \text{Rs. } 12 \text{ lakh}$. Using this value of the total property, we can refer to the given data and obtain the distribution of property among the four sons as follows.

		Son 1	Son 2	Son 3	Son 4
Gold Coins	Number	60	---	24	24
	Value	240000	---	96000	96000
Silver Bars	Number	---	180	24	24
	Value	---	180000	24000	24000
Cash		60000	120000	180000	180000
Total		300000	300000	300000	300000

4. Radhika's total property is worth Rs. 12 lakh. Hence answer option is c.
5. Radhika had a total of 108 Gold Coins worth Rs. 432000 and a total of 228 Silver Bars worth Rs. 228000. Therefore, the ratio of the amount of property that she held in Gold Coins and Silver Bars is 36:19. Hence answer option is d.
6. Radhika's sons held "Wealth" equal to Rs. 240000, Rs. 180000, Rs. 120000 and Rs. 120000. Therefore, the ratio of the "Wealth" held by them is 4:3:2:2. Hence answer option is d.
- Alternate method:**
Also looking at the answer options, last two sons will have equal wealth, which is there in answer option d only.

Solutions to Questions 7 to 14.

7. By adding up the cost for the given years it is evident that '87 + '89 together have the maximum (6399) for the given years. Hence answer option is d.
8. Since they account for a combined 70%, we have to check out for the years where 70% of that year's contribution is greater than the previous years contribution. Only two years, '86 and '93 satisfy the required condition. Hence answer option is c.
9. Since Andhra Pradesh's 40% for a given year must be less than West Bengal's 30% for the next year, the two successive year's costs must be in the ratio 3:4 or lesser. Only 2 years, 85 – 86 and 92 – 93 satisfy the given condition. Hence answer option is c.
10. Of the remaining 30%, Karnataka and Kerala account for 45% and 20%. So the difference is 25% of 30% which is 7.5% of the total. The lowest total is 1702. So 7.5% of 1702 is $\approx 127(+)$. So the answer is (d) none of these.
11. Since 32% gets equally divided among the 2 states, each of them get 16% of the total of Rs. 3950 crore \approx Rs. 632 crore. Hence answer option is b.
12. Of the total 22 parts (by adding the ratio terms), Tamil Nadu gets the second lowest, i.e. 2 parts, i.e. $[(2/22) \times 100]\%$ of the total of 2752 which is $[(1/11) \times 2752] \approx 250\%$. So the answer is (d) none of these.
13. The total for the 90's is \approx Rs. 12750 crore. So the average is \approx Rs. 2125 crore. Hence answer option is a.
14. 18% of a population of 84 crore $\approx 15(+)$ crore. So of a total of Rs. 2504 crore, the average distribution will be $2504 / 15 \approx$ Rs. 165. So the answer must be (d) none of these.

Solutions to Questions 15 to 23.

15. Soaps contributed 16% of 84 lakh in 96 and 22% of 112 lakh in 97. So the approximate contribution is $13(+)$ + $25(-)$ \approx Rs. 38 lakh. Hence answer option is c.
16. Additional contribution is the same as the difference in the actual amounts. Since the percentage contribution of hair oil remained the same during both the years, the difference in contribution is 12% of $(112 - 84) = 0.12 \times 28 \approx$ Rs. 3.40 lakh. Hence answer option is b.



17. In 1996, detergents contributed 23% while hair oil and face powder contributed $12+9 = 21\%$. So the difference in contribution was 2% of 84 which is Rs. 1.68 lakh. Hence answer option is a.
18. The answer Indeterminable because we do not know whether the price of toothpaste has remained the same, over the two-year period, or not. Hence answer option is d.
19. Since the total profits for the two years are in the ratio 84 : 112, which can be reduced to 3 : 4, the actual contribution of an item will be the greater for the next year only if the percentages are in the ratio 4 : 3 or greater. So only two items do not fit the criteria, toothpaste and shampoos. So the answer is 4 items. Hence answer option is b.
20. Since the total profits are in the ratio 3 : 4 (from the above solution), the percentage increase in profits is $4 - 3 \times 100 / 3 = 33.33\%$ ($1/3$), the increase in the profits of soaps has been 0.16×3 to 0.21×4 , which in percentage terms is $(0.84 - 0.48) \times 100 / 0.48 = 75\% = \frac{3}{4}$. So the ratio is $(3/4) / (1/3) = 2.25 : 1$. Hence answer option is a.
21. Hair oil had a 12% share of 112, while face powder had a 11% share of the same profit. Since the advertising expenditure on hair oil was 4% while that on face powder was 5%, the total expenditure on advertising becomes $112 \times (0.04 \times 0.12 + 0.05 \times 0.11) = 112 \times (0.0048 + 0.0055) \approx 112 \times 0.0103 \approx$ Rs. 1.15 lakh. Hence answer option is a.
22. The profit on detergents was 30% of 112, which is Rs. 33.6 lakh. This profit forms 18% of the cost price. So the sales (selling price) to the profits ratio will be 118:18. So the actual selling price will be $33.6 \times 118 / 18 \approx 220$ (+). Hence answer option is d.
23. The tax in 96 was 42% of 84 ≈ 35 (+) The tax in 97 was 48% of 112 ≈ 54 (-) So the difference in the tax paid \approx Rs. 18 (+) lakh. Hence answer option is c.

Solutions to Questions 24 to 30.

24. Adding up the approximate quantity of wheat and dividing it by the total quantity of wheat rice in the given period will give us $\approx 5500 / 6100 \approx 90\%$. Hence answer option is c.
25. The difference (in '000 tonnes) from '82 to '85 is $1290 + 1815 + 360 \approx 3400$ '000 tonnes = 3.4 million tonnes. Hence answer option is b.
26. The foodgrains quantity imported in 84-85 was 640, while in 71-72 it was 2055. So the approximate percentage is $640 \times 100 / 2055 \approx 30$ (+)%. Hence answer option is b.
27. In '83 – '84, 2142000 tonnes of wheat @ Rs. 2400 / tonne will mean an expenditure of Rs. 514 crore. So the remaining is $587-514 = 73$ crore which was spent on importing 328000 tonnes of rice. So the price of rice = $730000 / 328 \approx$ Rs. 2225 / tonne. Hence answer option is b.
28. Adding up the required corresponding values we will get an approximate value of 1434. Hence answer option is c.
29. Rice = 516 and wheat = 2591. \therefore The required percentage = $[(516/2591) \times 100] \approx 20$ (-)%. Hence answer option is a.
30. In '80 – '81 296000 tonnes of wheat @ 2000 / tonne is Rs. 59.2 crore. So the remaining Rs. 20.8 crore was spent on 18000 tonnes of rice. Hence answer option is b.

Exercise - 7(A)

Solutions to Questions 1 to 7.

1. Checking the options for Sales, the sales for '74 is almost double that of the previous year and no other option comes this close. So the answer is '74. Hence answer option is a.
2. The addition of the net profit for the first five years will come to (-1.8) lakh. Hence answer option is c.
3. Expenses = Sales – Net Profit. The difference of sales and net profit is maximum for the year '78. Hence answer option is c.
4. From the given options, only in 1975-76 you have the Sales and Net Profit showing the same trend; of either an increase or a decrease. Hence answer option is b.
5. The combined Net Profit for 79 and 80 was $29.9 \approx 30$ lakh. This net profit is obtained after having paid 55% tax on the gross profit. So the remaining will be 45% of the gross and this corresponds to 30 lakh. So 100%, i.e. the combined gross profit must correspond to $30 \times 100 / 45 = 66.66 \approx 67$ lakh. Hence answer option is a.
6. Since 1981 had an 18% increase in the Net Profit over 1980, the Net Profit for 1981 was $1.18 \times 15.6 \approx 18.4$ and this is 20% of the Sales of 81. So the sales of 81 was $18.4 \times 100 / 20 \approx \text{Rs. } 92$ lakh. Hence answer option is d.
7. The advertisement expenditure was 2.5% of Sales = $2.5 \times 64 / 100 = 1.6$. So the percentage of Net Profit = $1.6 \times 100 / 15.6 \approx 10(+)\%$. Hence answer option is b.

Solutions to Questions 8 to 15.

8. Consumer goods in 1960-61 has a 60° share which corresponds to $60 / 3.6 = 16.67\%$ share of the total of Rs. 1795 crore. So the actual amount is approximately $1800 \times 16.67\% \approx 1800 / 6 \approx 300(-)$. Hence answer option is c.
9. The central angle made by raw materials to the total in 1970-71 was 192° which is $192/3.6 \approx 53.3\%$, while in 1980-81 it was 280.8° which was a 78% share. So the difference in their percentage shares was an increase of approximately 25. Thus the answer is (d) .
10. Consumer goods in 60-61 corresponds to 60° which is $\approx 16.67\%$ of the total of Rs. 1795 crore which is approximately Rs. 300 crore. In 1970-71 raw materials corresponds to 192° which is approximately 53.3% of Rs. 1634 crore and this is approximately Rs. 870 (+) crore. So the difference is of around Rs. 570 crore. Hence answer option is b.
11. Capital goods in 1980-81 corresponded to 54° which is 15% of a total of Rs. 12550 crore which is approximately Rs. 1880 crore. This value exceeded the total imports of 1960-61 (value = 1795) by around 85 crore. Hence answer option is a.
12. Consumer goods in 1980-81 have a 10.8° share which is 3% of the total of Rs. 12549 and this corresponds to an actual of Rs. 376. In 1960-61, consumer goods had a Rs. 300(-) crore share (from the 1st solution) and so there was an increase of approximately Rs. 75 crore. Hence answer option is d.
13. Since the price of nickel need not be the same as that of other raw materials, the answer Indeterminable. Hence answer option is d.
14. Capital goods in 1970-71 accounted for 90° which is 25% of 1634 crore, which is approximately 408 crore. 14% of this amount was utilised to purchase 210 textile units. So the price of each unit will be $(408 \times 14) / (100 \times 210) \approx \text{Rs. } 0.27 \text{ crore} = \text{Rs. } 2.7 \text{ million}$. Hence answer option is c.
15. Since the balance of trade was –1800 crore, the exports figure was $12549 - 1800 \approx \text{Rs. } 10750$ crore. 30% of this amount is approximately Rs. 3225 crore. Hence answer option is a.



Solutions to Questions 16 to 20.

16. Total revenue = $52 \times 41.23 \times 0.05 \times 200$ lacs = 214.9 Cr Hence answer option is d.
17. In yr 1990 total circulation was 35.58 lacs which increased to 89.03 lacs in 2001
Let say growth rate was R%
 $(89 - 35.58) = (35.58 \times R \times 11)/100$
 $R = 13.6\%$ Hence answer option is a.
18. Total sales = $365 \times 2(8.85 + 33.19 + 1.54 + 4.21) + 52 \times 5 \times 41.23$ = Rs 456 cr. Hence answer option is c.
19. Total market in 2001 = $8.85 \times 100/73 = 12.12$ lacs
Market size in 2002 would be , $12.12 \times 1.15 = 13.94$ lacs
Economic times sales in 2002 would be , $13.94 \times 60/100 = 8.45$ lacs Hence answer option is c.
20. Just by looking at the sales we can say Economic times has shown the highest growth of around 250% while Sunday Times and Times Of India both have shown growth of around 200%. Note that Navbharat times has reduced in the circulation. Hence answer option is a.

Exercise - 7(B)

Solutions to Questions 1 to 8.

Note :Areas given are in '000 hectares while Production values are in '000 tonnes. One tonne = 1000kg

1. For India, maize production = 4711 and area = 11035. \therefore The yield per hectare = $4711 \times 1000/11035 \approx 428$ kg per hectare. For Karnataka, the production = 374 and area = 437, so yield per hectare = $374 \times 1000/437 \approx 855$ kg per hectare. So the difference = $855 - 428 \approx 425$ kg per hectare. Hence answer option is b.
2. In Karnataka, the production = 538, area = 324. \therefore The yield per hectare = $538 \times 1000/324 \approx 1660$ kg. For India, the production = 7103 and area = 7815, so yield per hectare = $7103 \times 1000/7815 \approx 910$ kg. \therefore The required percentage = $[(1660/910) \times 100] \approx 182\%$. Hence answer option is b.
3. We have to find the maximum value for $[(\text{Karnataka production}) / (\text{India Production})] \times 100$. Check only for the answer choices given, and simplify the calculations by considering only the most significant digits and approximating. The answer is Ragi, which forms $[(410/2904) \times 100] \approx 14\%$. This is the only value significantly greater than 10%. Hence answer option is b.
4. By visual inspection, see that the length of the upper portion (i.e. production) is greater than 1.5 times the length of the corresponding lower portion. Only sugarcane satisfies this condition. Hence answer option is b.
5. Convert areas to million hectares by dividing the given values by 1000. Irrigated area = 11 hectares, so the unirrigated area = $16.273 - 11 = 5.273$ million hectares. Production in the irrigated area = 90 lakh tonnes, so that in the unirrigated area = $[118.18 - 90] = 28.18$ lakh tonnes. \therefore The yield per hectare in the unirrigated area = $28.18 \text{ lakh tonnes} / 5.273 \text{ million hectares} = [2818 \times 1000 \times 1000 \text{ kg}] / [5.273 \times 1000 \times 1000 \text{ hectares}] \approx 535$ kg per hectare. Hence answer option is b.
6. The index of production is directly proportional to the actual production. For India, the production index went up from 100 to 155, while for Karnataka, it went up from 100 to 132. Note that here, the multiplying constant which connects the index value to the actual production is (logically) different for India and for Karnataka.
In 1970-71, production of Ragi in Karnataka = $410 \times 100/132 \approx 310$, while the production in India = $2900 \times 100/155 = 1870$. \therefore The required percentage = $[(310/1870) \times 100] \approx 16.6\%$. Hence answer option is b.

7. Though 10% of the land became unavailable, it is not known which crop was grown in that region, or whether there was an even distribution of this 10% land over all the crops. So the answer for a specific crop like sugarcane can't be determined. Hence answer option is d.
8. Rs. 400 per quintal (i.e. 100 kg) = Rs. 4000 per tonne. \therefore Revenue = $4000 \times 1651 \times 1000 = \text{Rs. } 6604 \times 10^6$. Expenditure = $\text{Rs. } 30,000 \times 167 = \text{Rs. } 5010 \times 10^6$. \therefore Profit = $(6604 - 5010) \times 10^6 = \text{Rs. } 1594 \times 10^6 = \text{Rs. } 159.4 \text{ crore}$. Hence answer option is b.

Solutions to Questions 9 to 15.

9. IOC's market share = 55.2% HPCL and BPCL's combined share = $20.3 + 19.5 = 39.8\%$ So the percentage that the latter forms of the former is $39.8 \times 100 / 55.2 \approx 4000 / 55 \approx 72(+)\%$. Hence answer option is b.
10. Since HPCL has a 19.5% share, which is IOC's northern region's share from the 55.2 nationally, the share of the other regions is $55.2 - 19.5 = 35.7\%$ of $12000 \approx 4300(-)$ crore. Hence answer option is a.
11. The answer is indeterminable because diesel and petrol may not be the only petroleum products sold. Hence answer option is d.
12. Since BPCL's revenue is equally divided among the four regions, each region contributes $20.3 / 4 = 5.075\%$ of the total. Of this 60% was because of petrol. So the remaining 40% was contributed by the other petroleum products. So the actual revenue was 40% of 5.075% of $12000 \approx 2.03\%$ of $12000 \approx \text{Rs. } 240(+)$ crore. Hence answer option is c.
13. We cannot determine the quantities sold because only the revenue breakup is known. The rates of the items are not known. Hence answer option is d.
14. IOC's grease forms 5% of its revenue which is the same percentage that Others forms of the total. So grease's percentage of Others will be the same percentage that Others forms of the total which is 55.2%. Hence answer option is d.
15. IOC's diesel's revenue forms 30% of the 55.2% share that IOC has; i.e. $30 \times 55.2 / 100 \approx 16.5\%$ of the total. BPCL's revenue is 20.3% of the total. So the percentage of IOC's diesel to that of BPCL's total is $16.5 \times 100 / 20.3 \approx 80 (+)\%$. Hence answer option is c.

Solutions to Questions 16 to 23.

16. 1990 exports = 2866; 1995 exports = 4666. \therefore **Annual** percentage increase = $(4666 - 2866) \times 100 / [2866 \times 5]$ (because it is in 5 years) = $1800 \times 100 / (2866 \times 5) \approx 12.5\%$. Hence answer option is b.
17. Carpets + Leather in 1990 = $713 + 204 = 917$; Carpets + Leather in 1995 = $1065 + 270 = 1335$. \therefore Percentage increase = $(1335 - 917) \times 100 / 917 \approx 420 \times 100 / 920 \approx 45\%$. Hence answer option is c.
18. Textiles to total in 90 = $1434/2866 \approx 50\%$. Textiles to total in 95 = $2585 / 4666 \approx 55\%$. So the difference in percentages is an increase of 5. Hence answer option is a.
19. India, with an export of 4666 million ECU, had a 1.43% share of the EU market. So the total size (100%) of the EU market in 1995 was $4666 \times 100 / 1.43 \approx 325000$ million ECU = 325 billion ECU. Hence answer option is c.
20. With an export worth 713 million ECU, leather had a 11% share of the EU market in 90. So the size of the market was $713 \times 100 / 11 \approx 6500$ million ECU = 6.5 billion ECU. Hence answer option is b.



21. India's 90 exports = 2866 million ECU and percentage share was 0.98%. So the EU market size in 90 was $2866 \times 100 / 0.98 \approx 292$ billion ECU. From the 4th question, we know that the 1995 EU market size was 325 billion ECU. So the percentage increase = $(325 - 292) \times 100 / 292 = 3300 / 292 \approx 3400/300 \approx 11(+)\%$. Hence answer option is a.
22. Jute is the obvious answer because its share went up more than twice. Hence answer option is a.
23. The EU market size was 325 billion ECU in 1995. A 10% increase will mean that the market size now is $325 + 32.5 = 357.5$ billion ECU. India's 3% share of this market is $0.03 \times 357 \approx 10.75$ billion ECU. Hence answer option is a.

Solutions to Questions 24 to 30.

24. The number of holdings of size 500 to 3000 hectares in 79-80 = $25936 + 6722 = 32658$, while the number of holdings of size 500 to 3000 hectares in 84-85 = $29201 + 7497 = 36698$. So the increase = $36698 - 32658 = 4040$. The increase in total number of holdings = $81569 - 71011 = 10558$. \therefore The required percentage = $4040 \times 100 / 10558 \approx 40 (+)\%$ but $< 45\% \approx 38.3\%$. Hence answer option is b.
25. Since total area remains the same (160 million hectares), percent change in share is $13.4\% - 9.3\% = 4.1\%$ of 160 million hectares = $4.1 \times 160 / 100 = 6.56$ million hectares. Hence answer option is a.
26. Average size of holdings (in hectares) = Area / number of holdings. The number of holdings of size less than 2000 hectares in 84 - 85 = $30050 + 29201 = 59251$. So the Area = $(4.3 + 19.2)\% = 23.5\%$ of 160 million hectares = $(25 - 1.5)\%$ of 160 = $40 - 2.4 = 37.6$ million hectares. So the average size of holdings = $37.6 \times 10^6 / 59251 \approx 38000 / 60 \approx 635$ hectares. Hence answer option is c.
27. Number of holdings of size 3000 to 10000 hectares in 89-90 = $(8 + 7)\% = 15\%$ of 90000 = 13500. Area of these holdings = $25400 + 34050 = 59450$ thousand hectares. Average holdings = $59450 / 13500 < 4.5 \approx 4.4$ thousand hectares. Hence answer option is a.
28. The actual area of size more than 2000 hectares in 1979-80 = $9.7 + 3.7 = 13.4\% = 13.4 \times 160 / 100 = 21.44$ million hectares. Area in 89 - 90 = $13200 + 4000 = 17.2$ million hectares. Change = $21.44 - 17.2 = 4.24$ million hectares = 4240 thousand hectares. Hence answer option is b.
29. The number of holdings of size less than 2000 hectares in 79-80 = $23696 + 25936 = 49632$, while number of holdings of size less than 2000 hectares in 89-90 = $(40 + 33)\%$ of total = 73% of 90000 = 65700. So the increase = $65700 - 49632 / 49632 \approx 66 - 50 / 50 = 16 / 50 \approx 0.32$. Hence answer option is b.
30. The number of holdings of size 3000 to 5000 hectares in 1979-80 = 6643, while the number of holdings of size 3000 to 5000 hectares in 1984-85 = 7000. \therefore The % change = $(7000 - 6643) / 6643 \approx 5.4\%$. The number of holdings of sizes 3000 to 5000 hectares in 1989-90 = 8% of 90000 = 7200. \therefore The % change = $7200 - 6643 / 6643 \approx 8.4\%$. So the percent of % changes = $5.4 \times 100 / 8.4 \approx 64\%$. Hence answer option is c.

Exercise - 8(A)

Solutions to Questions 1 to 7.

1. Airfreight's turnover was 17% of the Rs. 70 crore domestic sector and 41% of the Rs. 40 crore international sector. So the total was $0.17 \times 70 + 0.41 \times 40 = 11.9 + 16.4 = \text{Rs. } 28.3$ crore. Hence answer option is c.
2. Blue Dart's domestic turnover = $36 \times 70 / 100 \approx 25.2$ crore. The international turnover of the Others = 25% of 40 = 10 crore. So the difference in their shares is 15.2 crore. Hence answer option is a.

3. 35% of Blue Darts international cargo revenue = $0.35 \times 0.21 \times 40 \approx 2.94$ crore. Blue Dart's total revenue is $0.21 \times 40 + 0.36 \times 70 = 8.4 + 25.2 = \text{Rs. } 33.6$ crore. So the percentage = $2.94 \times 100 / 33.6 \approx 9(-)\%$. So the answer is (d) "None of these".
4. Skypak's share of Others for the domestic sector will be $8 \times 100 / 35 \approx 23\%$. Hence answer option is c.
5. Since the share of Others will remain the same, it will 35% of 70 = 24.5 Cr. The remaining $80 - 24.5 = 55.5$ Cr. Since combined share of Elbee and Airfreight is same as that of Blue Dart, its share = $55.5/2 = 27.75$ Cr. Hence answer option is b.
6. The answer is indeterminable because we do not know the size of the international cargo market. Hence answer option is d.
7. Since 30% has been taken over by DHL, and the remaining 70% gets distributed equally, everybody gets a $70/4 = 17.5\%$ share of the Rs. 150 crore market. So Elbee's share will be $0.175 \times 150 = \text{Rs. } 26.25$ crore. Hence answer option is c.

Solutions to Questions 8 to 15:

8. By adding up the approximate values of the exports for the given months the answer is obtained as approximately 2255. Hence answer option is c.
9. By checking out the options it becomes clear that the answer is August + November. Hence answer option is d.
10. The difference between the imports and exports for the three months are +12.5, -5 and +10. So the total difference is Rs. 17.5 million. Hence answer option is c.
11. Adding up imports and exports separately and then taking the difference gives a difference of +60. So the imports exceeded the exports by Rs. 60 million. Hence answer option is b.
12. Counting it gives us the answer as 8. Hence answer option is a.
13. It is evident that the month is June and imports bill is 380 million. Hence answer option is c.
14. By looking at the graph it is evident that imports were maximum between July and September. Hence answer option is c.
15. At the start of the graph it is seen that in the first quarter (i.e. the first three months), the sum of imports is equal to the sum of exports. So the difference will be the least for the first quarter. Hence answer option is a.

Solutions to Questions 16 to 20.

16. In 2001, number of
16-25 females = $1.2 \times 0.35 \times 200 = 84$ million
25 above males = $1.3 \times 0.30 \times 200 = 78$ million
others = $1.15 \times 0.35 \times 200 = 80.5$ million
total consumers in 2001 = 242.5 million. Hence answer option is c.
17. Kingfisher sales = $0.30 \times 0.45 \times 2672 = \text{Rs } 360$ cr
Bacardi sales = $0.24 \times 0.17 \times 2672 = \text{Rs } 110$ cr
Diff in the sales = Rs 250 cr. Hence answer option is d.
18. In the question, its not mentioned as to what part of the growth is contributed by people below 16 years age, hence can't be determined. Hence answer option is d.
19. Sales in 2005 = $1.2[2672(1.1)^4] = \text{Rs } 4694$ cr. Hence answer option is c.



20. Total Sales of brandy, gin and vodka to that of beer = $(10 + 5 + 13) \times 100 / 45 = 62\%$. Hence answer option is b.

Exercise - 8(B)

Solutions to Questions 1 to 5.

1. Eedhar – Ka – Maal – Oodhar Enterprises can adopt one of the strategies X, Y or Z. Along with the payoffs, it will also have to incur a certain amount of expenses. So, we can calculate the net payoff for the three strategies as follows.

Strategy	Payoff	Expenses	Net Payoff
X	-4000	7000	-11000
Y	10000	9000	1000
Z	16000	6500	9500

From the table, we can see that Eedhar – Ka – Maal – Oodhar Enterprises should adopt strategy Z for the maximum payoff. Hence answer option is c.

2. We can calculate the net payoff for the different strategies that the Oodhar – Ka – Maal – Eedhar Enterprises can adopt as follows.

Strategy	Payoff	Expenses	Net Payoff
X	16000	7000	9000
Y	-6000	9000	-15000
Z	15000	6500	8500

From the table, we can see that Eedhar – Ka – Maal – Oodhar Enterprises' maximum payoff is 9000. Hence answer option is b.

3. From the given table, it can be seen that if Oodhar – Ka – Maal – Eedhar Enterprises adopts strategy Z, then Eedhar – Ka – Maal – Oodhar Enterprises should adopt strategy Z to minimise Oodhar – Ka – Maal – Eedhar Enterprises' gain. Hence answer option is c.
4. We have already calculated that if Eedhar – Ka – Maal – Oodhar Enterprises adopts strategy Y, then Oodhar – Ka – Maal – Eedhar Enterprises should adopt strategy X for maximum gains. Hence answer option is a.
5. If Oodhar – Ka – Maal – Eedhar Enterprises adopts strategy Z, we can calculate Eedhar – Ka – Maal – Oodhar Enterprises' losses for the different strategies that it can adopt as follows.

Strategy	Payoff	Expenses	Net Payoff
X	-16000	8500	-24500
Y	-15000	6000	-21000
Z	4000	5500	-1500

From the table it can be seen that Eedhar – Ka – Maal – Oodhar Enterprises should adopt strategy Z in order to minimise its losses. Hence answer option is c.

Solutions to Questions 6 to 14.

6. Wipro's share of the total is approximately $7000 \times 100 / 85000 \approx 8.2\%$. Hence answer option is c.
7. Modi and Lexmark combined have a total of 3740. Canon and Apple have a combined total of 3992. The difference in their shares is approximately 250 of a total of 84401 which will be a very small percentage, certainly much less than 0.5%. So the answer is (d) none of these.
8. The percentage share ratio will be the same as the ratio of the number of pieces. So the ratio of Epson to Others is 7223 : 2067 which is approximately 3.5(+) : 1. Hence answer option is c.

9. TVS' share 30% of Others' 2067 \approx 620. Apple sells 277. So the difference is = 343. Hence answer option is b.
10. The answer Indeterminable because we do not know if their UP plants are only at Lucknow. Hence answer option is d.
11. Canon and Epson at present have a combined production of $3715 + 7223 \approx 10940$. A 20% increase will mean $10940 \times 6 / 5 \approx 13125$. Hence answer option is a.
12. If the present 60404 pieces corresponds to an index of 252, an index of 100 will correspond to $60404 \times 100 / 252 \approx 60000 \times 0.4 \approx 24000$ (-). This production figure corresponds to a 75% share of the total. So the total was approximately $24000 \times 100 / 75 \approx 24000 \times 4 / 3 \approx 32000$ (-). Hence answer option is b.
13. Percentage of HP's share of the total printers = $60404 \times 100 / 84401 \approx 71(+)\%$. Remaining printers $\approx 84400 - 60400 \approx 24000$. Epson's share of this is $7223 \times 100 / 24000 \approx 30\%$. So the approximate difference is 41(+). Hence answer option is b.
14. Ratio of Tetronix to Lexmark share remains same but we don't have any information as to what are their actual shares in 1990, hence answer is (d) can't be determined.

Solutions to Questions 15 to 22.

15. Normal length of life is 100% engine life, which is achieved at a speed of 40 mph. Hence answer option is c.
16. Let normal life be X, at 20 mph, engine life is 200% so it becomes while at 40 mph it is 100%, which is X. 2X is one time more than X. Hence answer option is a.
17. Half the normal life, i.e. 50% engine life corresponds to a speed of 60 mph. Hence answer option is d.
18. At 60 mph, engine life is 50%, which corresponds to 30000 miles. So, normal life = 60000 miles. At 30 mph, the engine life is 140%. So corresponding distance will be $60000 \times 140 / 100 = 84000$ miles. Hence answer option is c.
19. The normal life of the engine was 60000 miles. At 60 mph, the engine life is 50%. So the life of the engine is 30000 miles, of which 20000 miles have already been covered; i.e. $2/3^{\text{rd}}$ of the engine life is over and so only $1/3^{\text{rd}}$ remains. $1/3^{\text{rd}}$ of the normal life, i.e. 60000 miles is 20000 miles. Now at 30 mph, the engine life is 140%. So 140% of the remaining 20000 miles is 28000 miles. So the total engine life will be $20000 + 28000 = 48000$ miles. Hence answer option is c.
20. At 50 mph, the engine life is 70% of the mentioned 60000 miles. So the engine life now is 42000 miles. It is rebored after 75% of 42000 i.e. 31500 miles. So the remaining life before the reboring was $42000 - 31500 = 10500$ miles. After reboring the engine life is increased by 50% (of 42000). So reboring increases the engine life by 21000. This gets added to the remaining 10500 miles. Effectively 31500 miles is the remaining engine life. Hence answer option is c.
21. At 50 mph, engine life is 70% and at 30 mph it is 140%. So from 70 to 140, the engine life has improved by $[(140 - 70) \times 100 / 70] = 100\%$. Hence answer option is b.
22. At 30 mph, the engine life is 140%. Since every third mile covered increases the life by 10%, the increase is 14% distributed over every three miles. So every mile has a $14 / 3 = 4.66\%$ increase. So the effective increase is $140 + 4.66 = 144.66\%$. Hence answer option is a.

Solutions to Questions 23 to 30.

23. The other two Indian cities are Bangalore and New Delhi. Their average of their costs are $(16452 + 35496) / 2 \approx 25975$. The cost of office property at Mumbai is 60876. So Mumbai is $60876 / 25975 \approx 2.4$ times the average of the other two cities. Hence answer option is d.



24. The price of unit property at Hong Kong is 47664, while that Chicago is 14328. So the percentage difference is $(47664 - 14328) \times 100 / 14328 \approx 33330 / 143 \approx 7/3 \approx 233\%$. Hence answer option is d.
25. The price of property in Paris is Rs. 24372 for each sq. m. So the price to be paid for 150 sq. m. is $24372 \times 150 \approx \text{Rs. } 3655800$ But 1 US\$ = Rs. 36.
So in terms of thousand \$ = $3655800 / (36 \times 1000)s \approx 101.5$. So the answer must be (d) none of these.
26. The price of office space at Tokyo was Rs. 44532 per sq. m. So the price of 8000 sq. m. of office space, in thousand rupees, must be 44532×8 . But a discount will mean that the price to be paid is only 90% of the original price. So the actual amount was $44532 \times 8 \times 0.9 \approx \text{Rs. } 320500 (+)$. Hence answer option is a.
27. Since the amounts were the same, the ratio of office areas will be inversely proportional to the ratio of their rates. Since the rates of the Singapore and Amsterdam office are in the ratio 31968 : 10296, which is slightly greater than 3; the area of the Amsterdam office to that of the Singapore office, will be in the ratio 3 (+) : 1. So the area of the Amsterdam office must be slightly greater than 3 times 2000. So the nearest answer must be 6200. Hence answer option is b.
28. US\$ 1.5 million will mean Rs. 54 million. So the area will be $54 \text{ million} / 27540 \approx \text{less than } 2000 \text{ sq. m.}$ So the answer is none of these. Hence answer option is d.
29. US\$ 234570 = Rs. 234570×36 , so area of required office $234570 \times 36 / 35496 \approx 240 \text{ sq. m.}$ Hence answer option is b.
30. 4000 sq. m. of office space at Frankfurt will be rated at cost Rs. 17172×4000 . Since 4DM = 3 US\$, 1 DM = $36 \times \frac{3}{4} = \text{Rs. } 27$. So the cost of the office space (in thousand Deutsche Mark) = $17172 \times 4000 / 27 \times 1000 \approx 2500 (++)$. So the nearest correct option is 2544. Hence answer option is d.

Exercise - 9(A)

Solutions to Questions 1 to 8.

1. Over the given period, AIR's revenue has increased from 6.26 to 81 crore. So the increase is = $81 / 6.26 \approx 13 (-)$. Hence answer option is c
2. AIR's commercial earnings in 1985-86 = 20.19. AIR's commercial earnings in 1995-96 = 81. So the annual percentage increase = $(81 - 20.19) \times 100 / (20.19 \times 10) \approx 60/2 \approx 30\%$. Hence answer option is c
3. Percentage increase in Vividh Bharati's revenue from 1985-86 to 95-96 = $(37.3 - 17.55) \times 100 / 17.55 \approx 110 (+)\%$. Percentage increase in Vividh Bharati's revenue from 1975-76 to 1985-86 = $(17.55 - 6.26) \times 100 / 6.26 \approx 180 (+)\%$. \therefore Change in percentage ≈ -70 . Answer option should not have percentage sign. Hence answer option is c
4. The answer Indeterminable because we cannot assume 1985-86 as the year of inception. Hence answer option is d
5. The remaining earnings of 1995-96 were $81 - 10 = \text{Rs. } 71$ crore. The earnings of 1980-81 were Rs. 12.5 crore. The percentage is $70 \times 100 / 12.5 = 70 \times 8 = 560 \%$. So the answer is none of these. Hence answer option is d
6. The percentage increase in the revenue of Vividh Bharati from 1990-91 to 1995-96 is $(37.3 - 25.25) \times 100 / 25.25 = 12.05 \times 100 / 25.25 \approx 48 (-)\%$. The percentage increase in the revenue of the Primary Channel from 90-91 to 95-96 is $(43.7 - 14.05) \times 100 / 14.05 = 29.65 \times 100 / 14.05 \approx 210 (+)\%$. So the percentage = $48 \times 100 / 210 \approx 25 (-)\%$. Hence answer option is a

7. In 1990-91, the total commercial earnings was 39.3 crore. In 96-97 it was expected to touch 100 crore. So the annual percentage increase in the given period was $(100 - 39.3) \times 100 / (39.3 \times 6) \approx 6000 / (40 \times 6) \approx 25 (+)\%$. Hence answer option is b
8. The other private broadcasters earn 40% of 18% of that earned by private broadcasters including Times FM. So the actual amount will be $0.4 \times 0.18 \times 81 \approx 6 (-)$ crore. Hence answer option is c

Solutions to Questions 9 to 14.

9. Deficit with Japan = $0.15 \times 52045 - 0.05 \times 42687 = \5.6 bn. Hence answer option is a.
10. Software exports to USA = $0.7 \times 0.30 \times 42.687 = \$ 8.96$ bn Hence answer option is a.
11. Import from Europe = $0.15 \times 52.04 = \$7.8$ bn
Exports to Europe = $0.13 \times 42.687 = \$5.5$ bn
Required percentage = $5.5 \times 100 / 7.8 = 70.51\%$. Hence answer option is c.
12. Nothing is mentioned between Rouble – Dollar convertibility it can't be determined. Hence answer option is d.
13. Imports from USA in 2001-02 = $1.2 \times 0.35 \times 52.04 = \$ 21.85$ bn
Exports to USA in 2000-01 = $30 \times 42.687 = \$ 12.8$ bn
So exports should increase by $9.05 \times 100 / 12.8 = 70.70\%$ Hence answer option is c.
14. Imports from Germany = $0.35 \times 0.15 \times 52045 = 2732$. Exports to Europe = $0.13 \times 42687 = 5549$. Since, exports to Germany = imports from Germany, required % = $2732 \times 100 / 5549 = 49\%$. Hence answer option is c.

Solutions to Questions 15 to 20.

15. Industry size = $100/80[24 \times 9(6.2+5.5+3.1)] = \text{Rs } 399.6$ cr Hence answer option is b.
16. Total sales of ThumsUp = $2.1+3.2+2.3+2.8+4.3+6.2 = 20.9$ mn cases
Total sales of Pepsi = $1.5+1.8+2.9+4.2+5+5.3 = 20.7$ mn cases
So answer is ThumsUP. Hence answer option is b.
17. ThumsUp in 96-97 = $1.1 \times 100 / 2.1 = 52\%$
Pepsi 98-99 = $1.2 \times 100 / 3 = 40\%$
ThumsUp 99-00 = $1.5 \times 100 / 2.8 = 53.57\%$
Coke in 97-98 = $0.6 \times 100 / 1.5 = 40\%$ Hence answer option is c.
18. Excise collection in 2000-01 = $60(6.2+5.5+3.1) = \text{Rs } 88.2$ cr. Hence answer option is b.
19. Sales of ThumsUp in 2001-02 = $1.4 \times 6.2 = 8.68$ mn cases
Sales of Pepsi in 2001-02 = $1.25 \times 5.5 = 6.875$ mn cases
So, difference between the sales of these 2 brands = 1.8 mn cases. Hence answer option is a.
20. Ratio of ThumpsUp, Pepsi and CocaCola sale in 1995-96 is 2.1 : 1.5 : 1
Sales of CocaCola in 01-02 = $1.1 \times 3.1 = 3.41$ million cases
So the total sales of cola in 2001 – 02 will be $3.41 \times (2.1 + 1.5 + 1) \approx 15.69$ million cases. Hence answer option is a.



Exercise - 9(B)

Solutions to Questions 1 to 6.

- From the first graph, we can see that the value for the demand for Rice in a particular year is almost the same as the supply of Rice the next year. So, we can say that there is a time lag of one year between the demand for and the supply of Rice.
From the second graph, we can see that the value for the demand for Wheat in a particular year is almost the same as the supply of Wheat after two years. So, we can say that there is a lag of two years between the demand for and the supply of Wheat. Hence answer option is b.
- The total demand for Wheat from 1990 to 1996 is 1244 tons and the total supply of Rice from 1990 to 1996 is 933 tons. Therefore, the total demand for Wheat forms $1244/933 = 125\%$ of the total supply of Rice. Hence answer option is c.
- The values for the total demand for and supply of Rice from 1990 to 1996 are 1125 tons and 993 tons respectively. The values for the total demand for and supply of Wheat from 1990 to 1996 are 1244 tons and 991 tons respectively. The difference between the total demand for and supply of Rice for the given period is 132 and that between the total demand for and supply of Wheat is 253. Therefore, the difference between the demand for and the supply of Wheat forms $[253/132] \times 100 = 190\%$ of the difference between the demand for and the supply of Rice. Hence answer option is d.
- If we add the values for the demand for and the supply of Rice and Wheat for the given years, we can obtain the values as follows.

	1990	1991	1992	1993	1994	1995	1996
Demand	213	263	310	342	381	410	450
Supply	168	198	230	288	328	367	405

From the table, we can see that the value for the demand of 213 in 1990 is more or less equal to the value of the supply somewhere midway between 1991 and 1992 similarly for the rest. So, we can say that there is a lag of one and half year between the demand for and the supply of Rice and Wheat together. Hence answer option is b.

- If the lags for Rice and Wheat are interchanged, the demand for Rice will be met after two years and the demand for Wheat will be met after one year. The corresponding values for the demand and supply from 1993 to 1995 can be obtained as follows.

Year	Rice		Wheat	
	Demand	Supply	Demand	Supply
1993	164	118	178	168
1994	182	148	199	182
1995	197	160	213	205
Total	543	426	590	555

From the above table, we can see that the difference between the demand for and supply of Rice is 117 and that between the demand for and supply of Wheat is 35. Therefore, the difference between the demand for and supply of Rice forms $117/35 = 335\%$ of the difference between the demand for and supply of Wheat. Hence answer option is d.

- Compare the values in the graph for the option years. In the year 1996 the gap between demand and supply is the least. Hence answer option is d.

Solutions to Questions 7 to 14.

- Since the question requires the cumulative outlay on Other Social Services for the given period, i.e. from 67 to 95; one must add up the respective outlays for Other Social Services. For Plan V the actual value is obtained by multiplying Plan III's 6616 with $250/100$ to get the actual as

16540. So the complete sum will be $1202 + 456 + 1902 + 6616 + 12063 + 16540 = \text{Rs. } 38779$ crore. Hence answer option is c.

8. Outlay on Health in Plan V = $2919 \times 350/100 \approx 2900 \times 3.5 = 10150 (+)$. Education outlay on Plan VI = $2212 \times 450/100 \approx 2200 \times 9/2 \approx 10000 (-)$. \therefore The required % = $[\text{Health/Education}] \times 100 \approx [10150/10000] \times 100 = 101.5\%$. Look out for the option just greater than 100%. Hence answer option is a.
9. Since the average annual expenditure is required, one must divide the outlay by the number of years. Since the Annual Plans is a 3 year period, annual outlay on Health = $663/3 = 221$. During Plan II, annual outlay on Health = $1712 / 5 = 342.4$. So the difference is $342.4 - 221 = \text{Rs. } 121.4$ crore. Hence answer option is a.
10. The total outlay of Plan III = Rs. 16128 crore. The outlay on Education in Plan V = $2212 \times 300/100 = 6636$. \therefore The required % = $[16128/6636] \times 100 \approx 240(+)\%$. So the nearest answer is 243.04%. Hence answer option is c.
11. Since percentage increase has been asked, it is obviously with respect to the previous year. By looking at the figures for the mentioned areas, it is obvious that Education or Housing cannot be the answer because the Plan IV figures are less than twice those of the Plan III figures (this means that the % increase is less than 100% and can be done mentally). Health = $6292 - 2919 / 2919 \approx 34/29 \approx 1.15$. Family Planning = $[3355 - 1451] / 1451 \approx 1900 / 1450 \approx 38 / 29 \approx 1.3 (+)$. So the correct answer is Family Planning. Hence answer option is c.
12. The current 70 paise value of the 1980 rupee means that 70 paise of 1980 have the same buying power as that of the current rupee. So, 70p of 1980 = 100p of 1985 – 90. So, 1p of 1980 = $100/70$ p of 1985 – 90. So, Rs. 3355 of 1980 = $3355 \times 10 / 7 = \text{Rs. } 4793$. Hence answer option is b.
13. A 20% drop in the value of the rupee during each plan will mean a rupee during Plan II will only be worth 64 paise during Plan IV. We have, $100 \times (1 - 20 / 100)^2 = 64$. So in terms of Plan II prices, the current outlay of Rs. 3404 crore of Plan IV is equivalent to Rs. $3404 \times 0.64 = \text{Rs. } 2178.56$ crore. Hence answer option is b.
14. In order to calculate the amount actually spent on eradication of slums only, we should know the ratio in which the outlay was distributed between “eradication” and “provision of flats”. Since this data is not available, the answer is ‘insufficient data’. Hence answer option is d.

Solutions to Questions 15 to 22.

15. The new licences issued in '93 were...
 Metallurgical: $1400 - 1280 = 120$ Electrical: $850 - 720 = 130$
 Chemical : $445 - 425 = 20$ Textile : $670 - 645 = 25$
 Total = $120 + 130 + 20 + 25 = 295$.

 The new licences issued in '95 were...
 Metallurgical: $1620 - 1480 = 140$ Electrical: $980 - 910 = 70$
 Chemical : $525 - 480 = 45$ Textile : $840 - 785 = 55$
 Total = $140 + 70 + 45 + 55 = 310$.
 \therefore The difference = $310 - 295 = 15$. Hence answer option is b.
16. The difference between the figures of the two years for a given category will give the number of licences newly issued within that period.
 Electrical = $910 - 720 = 190$; Metallurgical = $1480 - 1280 = 200$.
 \therefore The required percentage = $190 / 200 \times 100 = 19 \times 5 = 95\%$. Hence answer option is a.
17. Using the formula for percentage deviation and the figures for 1992 and 1995 as the initial and final values, calculate the industry with the smallest such value.
 Metallurgical = $1620 - 1280 \times 100 / 1280 = 34 \times 100 / 128 \approx 26 (+)\%$.
 Electrical = $980 - 720 \times 100 / 720 = 26 \times 100 / 72 \approx 35 (+)\%$.



Chemical $= 525 - 425 \times 100 / 425 = 100 \times 100 / 425 \approx 24 (-)\%$.

Textile $= 840 - 645 \times 100 / 645 \approx 200 \times 100 / 650 \approx 30 (+)\%$.

So the industry with the smallest percentage increase is Chemical. Hence answer option is c.

18. New textile units in '93 = $670 - 645 = 25$; Existing units = 645. Total expenditure = $(20 \times 25) + (1 \times 645) = \text{Rs. } 1145 \text{ lakh}$. \therefore The expenditure per unit = $1145 / 670 \approx 1.7 (+)$ i.e. $\approx \text{Rs. } 1.7 \text{ lakh}$. Hence answer option is d.
19. New licences to chemical units in '94 = $480 - 445 = 35$. 40% of these new units = $0.4 \times 35 = 14$ units. 20% of the existing units = $(20/100) \times 445 = 89$ units. Thus the total number of units which had to be closed down were $14 + 89 = 103$. From the total of 480, 103 were closed down. So $480 - 103 = 377$ remained unaffected. Thus the % of unaffected = $377 \times 100 / 480 \approx 78\%$. Hence answer option is d.
20. Number of chemical units in '95 = 525. So the number of metallurgical units in '96 = $2 \times 525 = 1050$. Thus the % decrease = $(1620 - 1050) \times 100 / 1620 = 57 / 162 \approx 35\%$. Hence answer option is b.
21. The answer Indeterminable because one cannot assign a particular parent industry to polyester. Hence answer option is d.
22. Since it will take 12 months to issue a licence, the new unit will be considered only from '96 for which we do not have the required data. So the answer definitely Indeterminable. Hence answer option is d.

Solutions to Questions 23 to 30.

23. In the Manufacturing industry (public sector), increase in employment opportunities from '75-'85 is = $1590 - 795 = 795$. In the Manufacturing industry (private sector), a similar increase = $4678 - 3968 = 710$. Thus the percentage that public sector forms of private sector = $795 \times 100 / 710 \approx 110(+)\%$. Hence answer option is d.
24. Public sector : Agriculture and Construction in '80 = $361 + 1002 = 1363$. Agriculture and Construction in '90 = $18000 \times (4 + 8) / 100 = 180 \times 12 = 2160$. \therefore The difference = $2160 - 1363 = 797$. Hence answer option is d.
25. Services has the public sector's largest share with 52% of 18000, i.e. $52 \times 18000 / 100 = 9360$. Manufacturing has the private sector's largest share with 54% of 8000, i.e. $54 \times 8000 / 100 = 4320$. So the required percentage = $9360 \times 100 / 4320 \approx 200 (++)\% \approx 216\%$. Hence answer option is d.
26. If 2 out of every 5 are graduates, 3 out of 5 are non – graduates. Transport in the public sector = 15% of 18000 = 2700. So non-graduates = $2700 \times 3 / 5 = 1620$. Hence answer option is c.
27. Mining and Quarrying in '90 in public sector = $18000 \times 6 / 100 = 1080$. From '75 (value = 250) to '90 (value = 1080), the percent increase = $1080 - 250 \times 100 / 250 = 830 \times 0.4 \approx 332\%$. But this increase of 332% has occurred in 15 years. So the annual growth rate is $332 / 15 \approx 22\%$. Hence answer option is c.
28. Private sector's construction industry figures are...
 '90 = $8000 \times 4 / 100 = 320$,
 '95 = $320 \times 9 / 10 = 288$,
 '80 = 83.
 \therefore The percentage increase = $(288 - 83) \times 100 / 83 = 205 \times 100 / 83 \approx 250 (-)\% \approx 247\%$.
 Hence answer option is b.
29. Since the 1995 values of the index for the private sector's service industry and the public sector's manufacturing industry are the same (120), the 1995 percentage deviation will be the

same as the deviation for the '90 figures. Since 1440 and 2160 are in the ratio 2:3, percentage deviation = $(2-3) \times 100/3 = -33.33\%$. Hence answer option is a.

30. In the private sector in '95 transport has the maximum % fall; i.e. the lowest index value (80). Transport in the private sector in '90 = $2 \times 8000 / 100 = 160$. In '95, transport = $160 \times 80 / 100 = 128$. So the actual figure is 128000. So in hundreds the answer is 1280. Hence answer option is a.

Exercise - 10(A)

Solutions to Questions 1 to 7.

- By visual inspection, it is clear that rice has the maximum increase in production [i.e. from 40 to 65] during the given period. \therefore % increase = $[(65-40)/40] \times 100 = 62.5\%$. Hence answer option is a.
- The production of wheat from 1977 to 1984 = $25 + 15 + 29 + 20 + 32 + 25 + 30 = 176$ million tonnes. \therefore the average production = $176/7 \approx 25$ million tonnes per year. Hence answer option is c.
- The maize production from 1978 to 1983 = $20 + 15 + 18 + 22 + 15 = 90$ million tonnes. Pulses from 1979 to 1983 = $16 + 20 + 15 + 15 = 66$. \therefore the required ratio = $90:66 \approx 1.36:1$. Hence answer option is a.
- Check by visual inspection that the production of wheat is less than the production of other foodgrains for two years, viz. 1978-79 and 1980-81. Of these two years, the wheat production is more than maize only in 1980-81, so the answer is 1. Hence answer option is b.
- The best way to identify the greatest increase is to see which band representing wheat has the greatest length compared to the previous. It can be seen here that the wheat production for 1979-80, which is 29 million tonnes, is almost double the production (15 million tonnes) of the previous year. \therefore the % increase = $[(29-15)/15] \times 100 = 93.3\%$. Hence answer option is c.
- The production of wheat in 1982-83 = 25 million tonnes. \therefore the actual wheat production in 1984-85 = $1.2 \times 25 = 30$ million tonnes. The lowest production of wheat in the given period was 15 million tonnes in the year 1978-79. \therefore the increase = $30 - 15 = 15$ million tonnes, which is (1×15) , i.e. exactly equal to the lowest, which means the production in 1984-85 is one time more. So the answer option is (d) None of these.
- The production of the various foodgrains in 1984-85 is as follows:

Rice = $1.25 \times 60 = 75$ million tonnes	Wheat = $1.2 \times 25 = 30$ million tonnes
Pulses = $1.5 \times 15 = 22.5$ million tonnes	Maize = $1.6 \times 15 = 24$ million tonnes
Others = $1.4 \times 15 = 21$ million tonnes.	

 \therefore Total = $75 + 30 + 22.5 + 24 + 21 = 172.5$ million tonnes. Hence answer option is a.

Solutions to Questions 8 to 15.

- Karnataka's total railway length is $65 + 122 + 365 = 552$ km of which broad gauge is 365. So the percentage is $365 \times 100 / 552 \approx 200/3 \approx 66\%$. Hence answer option is a.
- Madhya Pradesh's total railway length is $220 + 185 + 536 = 941$ of which broad gauge is $\approx 540 / 950 \approx 60$ (-)%. So the other part will have a 40 (+)% share which is approximately 43%. Hence answer option is a.
- Orissa's total railway length is $154 + 136 + 190 = 480$ km. The percentage of metre gauge is $136 \times 100 / 480 \approx 28$ (+)%. So the answer option is (d) none of these.
- Rajasthan's railway network has a length $125 + 181 + 276 = 582$ km. So narrow gauge and broad gauge combined = $(125 + 276) \times 100 / 562 = 401/562 \approx 71$ (+)%. So the answer is none of these. Hence answer option is d.



12. Delhi has 35% of the UT total of 135 km., which is approximately 47 km. Hence answer option is a.
13. In West Bengal, conversion of narrow gauge to metre gauge will cost $165 \times 2500 = 412500$. Conversion of metre gauge to broad gauge will cost $110 \times 1500 = 165000$. So the total cost will come to Rs. 577500. Hence answer option is a.
14. Bihar will convert half of the 190 km of narrow gauge to metre gauge and the remaining to broad gauge. Converting 95 km of narrow gauge to broad gauge will cost 95×3500 and the remaining 95 km to metre gauge will cost 95×2500 . So the total cost will be $6000 \times 95 = 570000$. So the answer will be none of these. Hence answer option is d.
15. Tamil Nadu converted the entire 110 km. of narrow gauge to metre gauge @ 2500/km. So they had to pay Rs. 275000. Now the total length of metre gauge is $293+110 = 403$ km. This is then converted to broad gauge @ 1500/km. This cost is Rs. 604500. So the total expenditure came to Rs. 879500. Hence answer option is a.

Solutions to Questions 16 to 20.

16. Difference in Tax = $8.6[21.5 - 0.6 \times 19.5] = \text{Rs } 84.28 \text{ cr}$. Hence answer option is b.
17. Total collection in North = $20(4+9+5+11) = \text{Rs } 580 \text{ cr}$
Total collection from South = $25(2.5+4+1.5+1) = \text{Rs } 225 \text{ cr}$
Reqd % = $355 \times 100 / 225 = 157.8\%$ Hence answer option is c.
18. In this problem, there is no mention about types of the movies. So, answer is (d).
19. Total viewers of MPK at the end of next yr = $180+10+(0.3 \times 0.8 \times 180) = 235 \text{ mn}$
Total viewers of Sholay = $1.1 \times 215 = 236.5 \text{ mn}$
So still SHOLAY would have maximum number of viewers. Hence answer option is a.
20. Deol loyalist viewers = 30 % of SHOLAY viewers. So, required percentage = $0.3 \times 215 / 195 = 33\%$. Hence answer option is a.

Exercise - 10(B)

Solutions to Questions 1 to 3.

1. If we follow a particular route to go from A to H, the activities other than on the route will take place simultaneously. E.g. when activity (A - C) takes place, activity (A - B) will occur simultaneously and will be completed before (A - C) as the duration is only 6 minutes. So, if we consider the longest route from A to H, all other activities will be completed before the activities on the route are completed. As (A - B - C - D - G - H) is the longest route with a total duration of 34 minutes, the time taken to manufacture one unit will be 34 minutes. Therefore, the time required to manufacture 25 units will be 850 minutes or 14 hours 10 minutes. Hence answer option is c.
2. The total available time is 600 minutes. The time required to manufacture 10 units is 340 minutes. This time along with the 10 minute break leaves 250 minutes, during which another 7 units can be manufactured with a wastage of 12 minutes. The next day, three units will be manufactured to complete a set of 10 and there will be a 10 minute break. If we consider that 17 units are manufactured every day, the time required will be 578 minutes. If we add two breaks to this time, we arrive at a total time of 598 minutes with a wastage of 2 minutes per day. Therefore, the total number of units manufactured in a week is 119. Hence answer option is b.
3. If we change the durations in the given network, we will still have to consider the duration of the longest route from A to H as the time required to manufacture one unit. Even after the change in duration of the activities, the longest route is (A - B - C - D - G - H) with a total duration of 36 minutes. As the original time required to manufacture one unit was 34 minutes, the percent

increase in the time required to manufacture one unit is $2/34 = 5.88\% \approx 6\%$. Hence answer option is a.

Solutions to Questions 4 to 6.

4. To find the maximum number of soaps, we will have to consider the minimum time required to manufacture P, Q and R. The lesser the time, the more will be the number of soaps manufactured. As there is no condition on the type of soap to be manufactured, we can consider only those types of soap which require the least time on the two machines. P requires minimum time on M_1 and Q requires minimum time on M_2 . We have a total of 480 minutes available on each machine. As P requires 8 minutes on M_1 , we can manufacture 60 soaps of P on M_1 with no idle time. As Q requires 9 minutes on M_2 , we can manufacture 53 soaps of Y on M_2 . Therefore, the maximum total number of soaps that can be manufactured in a day is 113. Hence answer option is a.
5. To manufacture 15 soaps of type R, we will first have to manufacture 45 soaps each of types P and Q. As we are considering the least time required for manufacturing, we will have to manufacture soaps of types P and Q on machines M_1 and M_2 respectively. 45 soaps of type P require 360 minutes on M_1 and 45 soaps of type R will require 405 minutes on M_2 . We are left with a balance of 120 minutes and 75 minutes on the two machines respectively. As each soap of type R requires 10 minutes to be manufactured on M_1 , we can manufacture 12 soaps with no idle time. At the same time, we can manufacture three soaps on M_2 with a balance of 39 minutes. Therefore, we do not need any extra time to manufacture 15 soaps of type R. Hence answer option is d.
6. The total time required to manufacture one soap each of types P, Q and R on M_1 and M_2 30 minutes and 33 minutes respectively. So, the maximum number of soaps of the three types that can be manufactured on M_1 and M_2 is 16 each and 14 each respectively. Therefore, the ratio of efficiencies is 14:16 or 0.875. Hence answer option is a.

Solutions to Questions 7 to 14.

7. The expected number of further years for a 20-year female in 1947 was 33 years (refer to the 1941-50 line). \therefore Mrs. Kapoor is expected to live upto $33+1947 = 1980$. Hence answer option is a.
8. The question requires us to find the increase in the entire life-span and not just the life expectancy in further years. According to the 1941 estimates, a 40 year old male would have lived for $40+20.5 = 60.5$ years. According to the 1961 estimates, a 40 year old male would have lived for $40+24.5 = 64.5$ years. \therefore The percentage increase = $[(64.5-60.5)/60.5] \times 100 = 6.6\%$. Hence answer option is c.
9. A female who was 50 years old in 1961 must have been 30 years of age in 1941. For a 30 year old female in 1941, the expected life-span = $30+26 = 56$ years. For a 50 year female in 1961, the expected life-span = $50+19 = 69$ years. \therefore the increase in life expectancy = $69-56 = 13$ years. Hence answer option is c.
10. Check whether the expectancy value for the females is greater than that of males for the lines of all the three years mentioned, for a particular age category. The age categories which satisfy this condition are 40 years, 50 years and 60 years. Hence answer option is c.
11. The required increase because of the new drug = $150 \times 1/20 = 7.5$ years. This increase has to be added to the life expectancy of in 1961-70. \therefore The life expectancy (in further years) = $7.5+40 = 47.5$ years. Hence answer option is b.
12. The new - born in 1931 will be 40 years old in 1971. The increase because of the drug = $150 \times 1/40 = 3.75$ years. This will be added to the life expectancy of a 40 year old female in 1961-70, which is 25 years. \therefore The total life expectancy = $40+25+3.75 = 68.75$ years. Hence answer option is b.



13. Her first daughter will be 30 years of age in 1971. So the increase will be $150 \times 1/30 = 5$ years. \therefore On lines similar to those in the previous problems, the total life expectancy = $30+32+5 = 67$ years. Her ninth son will be 10 years of age in 1971, so the increase will be $150 \times 1/10 = 15$ years. \therefore The total life expectancy will be $10+49+15 = 74$ years. \therefore The difference in the life expectancies = $74-67 = 7$ years. Hence answer option is d.
14. Note that we have to find the percentage increase for a “male”, as is evident from the word “his” in the question. In the decade 1941-50, he would complete 20 years and so his total life-span would be $20+33 = 53$ years. In 1961-70, his age would be 40 years and his life-span would be $40+25 = 65$ years. \therefore The percentage increase = $[(65-53)/53] \times 100 \approx 22\%$. Hence answer option is c.

Solutions to Questions 15 to 22.

15. In 1989-90, 25.8% of the total people are poor, and these are 210 million in number (throughout the country). Since 25.8% corresponds to 210 million, 100 will correspond to approximately 815 million. Hence answer option is a.
16. The urban population forms 19% of the total 350 million poor people. So the number of urban poor people = $[(19/100) \times 350] = 66.5$ million. These form 43% of the urban population. \therefore the urban population = $66.5 \times 100/43 \approx 155$ million. \therefore Those above the Poverty Line $155 - 66.5 = 88.5$ million. Hence answer option is a.
17. 82% of the total poor people (310million) within the country were from the rural area. $[(82/100) \times 310] \approx 255$ million. These 255 million form approx. 51% of the rural population, so the total number of rural people will be 100%, which is slightly less than twice of 255, ≈ 500 million. Hence answer option is a.
18. In the rural areas, the poor form 80% of the total 210 million, i.e. $0.8 \times 210 = 168$ million. These constitute 28% of the rural population, \therefore the total rural population = $[168 \times (100/28)] = 600$ million. So the number of rural people above the Poverty Line = $600-168 = 432$ million. Hence answer option is a.
19. In 1984-85, 19% of the total of 270 million poor were from the urban areas, which is = $[(19/100) \times 270] = 51.3$ million. These form 28% of the urban population. \therefore the urban population in 1984-85 = $[51.3 \times (100/28)] \approx 185$ million. Hence answer option is a.
20. In 1977-78, 48% of the total are poor (i.e. below the Poverty Line), so 52% are not poor. \therefore the number of people above the Poverty Line = $[310 \times (52/48)] \approx 336$ million. In 1989-90, 26% of the total are poor, so 74% are above the Poverty Line. \therefore The number of “not poor” people in 1989-90 is $[210 \times (74/26)] \approx 600$ million. Thus the increase over the given period $\approx 600-336 \approx 264$ million. Hence answer option is a.
21. In 1989-90, the initial area-wise distribution of rural and urban poor people is 80% and 20% respectively. Assume that there are in all 100 poor people. So 80 will be from the rural areas, while 20 will be from the urban. 10% of the rural, i.e. 8 people leave, so now there are $(80-8) = 72$ rural poor people. Of the 8 who have left, half, i.e. 4 still remain poor, while the other four are added to the urban poor, whose number now becomes $(20+4) = 24$. Thus, the rural poor are 72, while urban poor are 24, and the total no. of poor people is $72+24 = 96$. Thus the urban poor form $[(24/96) \times 100] = 25\%$ of the total poor. Hence answer option is b.
22. In 1989-90, approximately 25% of the population lives below the Poverty Line, i.e., of a total of 100 people, 25 are poor while 75 are not poor. Of these 75, 20%, i.e. 15 now become poor. So $(75-15) = 60$ remain above the Poverty Line, while $(25+15) = 40$ are below it. So the ratio of those above to those below becomes $60:40 = 3:2$. Hence answer option is a.

Solutions to Questions 23 to 30.

23. The term “break-even” means the point where the income equals the expenditure. The cost of the project is Rs. 1700 crore. Since the selling price of each Mint is Rs. 2.5 lakh, the production cost is 1.25 lakh and the profit is 1.25 lakh. So the number of Mints that have to be sold to recover the cost of the project = $[(Rs. 1700 \text{ crore}) / (Rs. 1.25 \text{ lakh per vehicle})] = 1,36,000$ vehicles. Hence answer option is b.
24. The Palio makes a profit of $\frac{1}{2}(3.2) = Rs. 1.6$ lakh per vehicle. To recover a project cost of Rs. 640 crore, it must sell $[(640 \text{ crore}) / (1.6 \text{ lakh})] = 40,000$ vehicles. Since the annual capacity is 16,000 vehicles, the production of 40,000 vehicles will take $40,000 / 16,000 = 2\frac{1}{2}$ years. March 1999 + $2\frac{1}{2}$ years = September 2001. Hence answer option is d.
25. A profit of Rs. 60,000 per car will mean that at the end of a year, after having sold 12000 vehicles, the total profit will be Rs. Rs. 72 crore. The cost of the project is Rs. 540 crore. So the % of the cost that is recovered is $[(72/540) \times 100] = 13.33\%$. Hence answer option is b.
26. After 12 months, 6000 Lancers are sold. So in 15 months, $[6000 \times 15/12] = 7500$ vehicles will be sold. The profit per vehicle is $\frac{1}{2}(7) = Rs. 3.5$ lakh. So the profit after 15 months will be $3.5 \times 10^5 \times 7500 = Rs. 262.5$ crore. \therefore The percentage of the amount not obtained is $[(900-262.5)/900] \times 100 \approx 71\%$, so the answer is “None of these”.i.e., (d)
27. 41% interest compounded annually for 2 years will mean almost doubling the cost, as $[1.41]^2 \approx 1.99 \approx 2.00$. After a 20% increase in the selling price, the new selling price will be $3 \times 6/5 = Rs. 3.6$ lakh. So the profit per vehicle will be Rs. 1.8 lakh. The new cost liability of the project is $\approx 2 \times 750 \approx Rs. 1500$ crore. \therefore The number of vehicles required to be sold in order to break even = $[(1500 \times 10^7) / (1.8 \times 10^5)] = 83,333$ vehicles. Hence answer option is b.
28. The new price of the car will be $6.5+0.5 = Rs. 7.0$ lakh, and so the profit will be Rs. 3.5 lakh. The number of vehicles sold remains at 8,000. So the total profit becomes $3.5 \times 8,000 = Rs. 280$ crore. Of this, Rs. 40 crore is a part of the cost of the project. \therefore The profit remaining = Rs. $280-40 = Rs. 240$ crore. Hence answer option is c.
29. The initial data about the 40% increase in capacity is redundant. The new cost of the project is $400+60 = Rs. 460$ crore. The profit per vehicle = Rs. $\frac{1}{2}(7.5) = Rs. 3.75$ lakh. So the number of vehicles required to be sold = $(460 \times 10^7) / (3.75 \times 10^5)$ which is slightly greater than $1,80,000/15$, i.e. greater than 12,000. Hence answer option is a.
30. Since we have the production of new model is twice the production of the Lancer, while sold at half the price of the Lancer, ratio of annual profits of the Lancer to those of the new model will be 1:1. Hence answer option is d.