Bar Charts

Level - 1

Directions for questions 1 to 5: Read the given information and answer the questions based on it.

There are two bar graphs given below, chart–1 and chart–2. The chart–1 represents the available quantity of various health drinks such as Wired X, Blast, Bliss, Gorilla Juice, Zoom, XS Citrus and Wild Bull. The chart–2 represents the percentage of Lime water, Water and Vitamins in the above mentioned drinks. All the health drinks are a mixture of only these three ingredients.

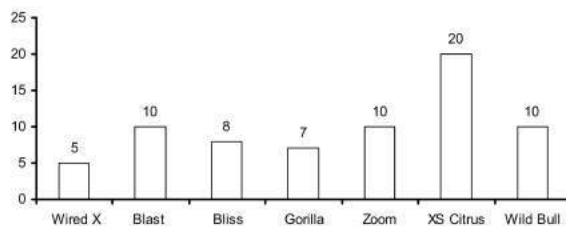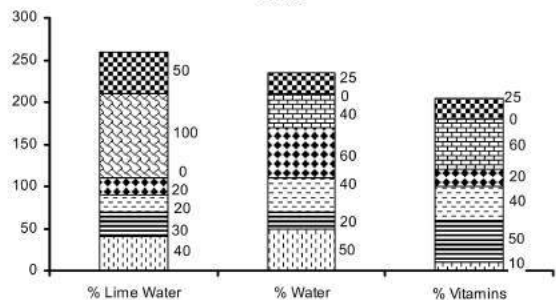**Chart – 1**

Available Quantity (in Litres)

Chart –

☐ Wired X ⊞ Blast ☐ Bliss ◨ Gorilla Juice ☒ Zoom ☒ XS Citrus ☒ Wild Bull

1. How many of the above mentioned health drinks, when mixed entirely with 10 L of Blast would result in a mixture containing lime water greater than 35%?
   (a) 1   (b) 2
   (c) 3   (d) 4
   (e) 5

2. If Wired X is mixed with Blast and Gorilla Juice in the available quantity, then what will be percentage of vitamins in the mixture ?
   (a) 31.36%   (b) 40.12%
   (c) 32.8%   (d) 42.36%
   (e) 36.42%

3. What will be the final concentration of lime water in the mixture, if all the health drinks with available quantity are mixed together?
   (a) 33.33%   (b) 47.14%
   (c) 40%   (d) 43%
   (e) 45.65%

4. If Wired X and Gorilla Juice are mixed with available quantities, then what will be quantity of vitamins in the final mixture?
   (a) 1.9 L   (b) 3.2 L
   (c) 2.8 L   (d) 1.5 L
   (e) 2.4 L

5. If equal quantities of all drinks are mixed then what will be concentration of lime water in the mixture?
   (a) 44.38%   (b) 40 %
   (c) 47.9%   (d) 30.26%
   (e) 37.14%

Directions for questions 6 to 8: Answer the questions on the basis of the information given below:

The bar graph given below shows the data regarding the marks secured by three students Andy, Bruce and Will in a class test. The maximum marks for the test was 20. Bar-I represents that Bruce has scored 7 marks more than Andy and bar II represents the sum of the marks of the three students. No student has scored either 0 or 20 marks in the test.
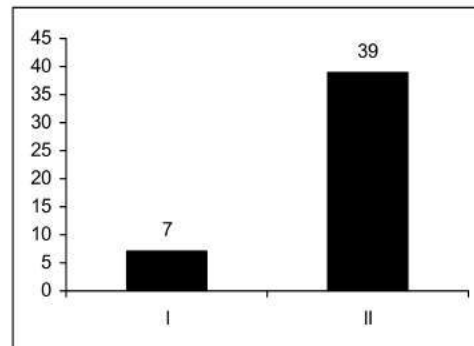
6. Which of the following cannot be the marks scored by Bruce?
   (a) 12   (b) 14
   (c) 17   (d) 19
   (e) 15

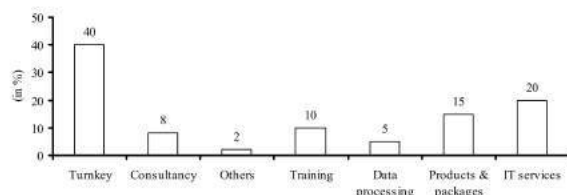**7.** Which of the following can be the maximum marks scored by Andy?

(a) 19   (b) 14

(c) 7   (d) 12

(e) 11

8. Which of the following can be the minimum sum of marks scored by Bruce and Will?
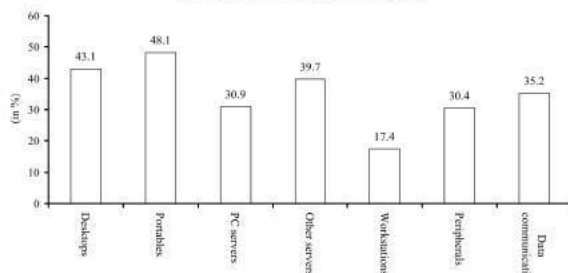
(a) 32   (b) 27

(c) 23   (d) 22

(e) 28

Direction for questions 9 to 13: Refer to the graphs below.

Software application - A segmentwise breakup (1999)

Market share of HP in computer hardware (1999)

You can use data derived from a question to answer further questions.

9. If training and consultancy in software applications is worth Rs. 1,250 crore in 1999, then what is the total market for software applications in 1999 ?

(a) Rs. 6,945 crore   (b) Rs. 5,695 crore

(c) Rs. 2,695 crore   (d) Rs. 14,440 crore

(e) Rs. 7840 crore

10. What is the sales of HP in data communication hardware if sales of workstations by HP is Rs.625 crore?

(a) Rs. 315 crore   (b) Rs. 1,275 crore

(c) Rs. 1,200 crore   (d) Rs. 875 crore

(e) Cannot be determined

11. If total sales of HP from hardwares is Rs. 2,500 crore divided equally among the seven streams, then what is the total market for peripherals in 1999 ?

(a) Rs. 825 crore   (b) Rs. 1,174 crore

(c) Rs.1,050 crore   (d) Rs. 1,280 crore

(e) Cannot be determined

12. Revenues from consultancy services as a percentage of revenues from PC servers for the software and hardware industry is

(a) 48%.   (b) 52%.

(c) 27%.   (d) 30%.

(e) 36%

13. What has been the total hardwares sale by players other than HP in 1999 ?

(a) Rs. 4,650 crore   (b) Rs. 11,375 crore

(c) Rs. 5,250 crore   (d) Rs. 6650 crore

(e) Rs. 3,875 crore

Level - 2

Directions for questions 14 to 17: Study the following bar chart and answer the questions given below.

The first bar chart gives the total assets of Reserve Bank of India (in Rs. crores) for the years 1950-51, 1970-71, 1980-81, 1985-86, 1990-91, 2000-01 and the second bar chart gives the percentage wise distribution of total assets in Rupees Securities, Gold, Rupee Coins and Foreign Securities.
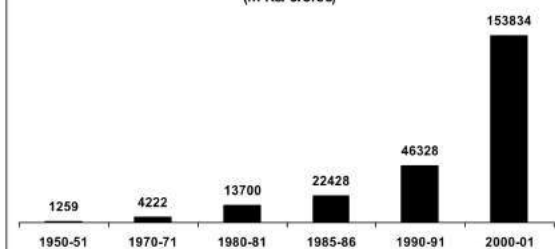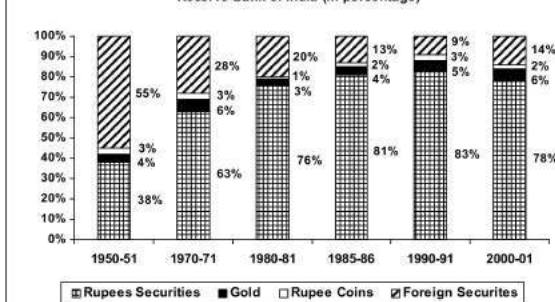
14. In which of the following periods, was the average annual growth of RBI assets the highest?

(a) '70-71 to '80-81   (b) '80-81 to '90-91

(c) '50-51 to '80-81   (d) '70-71to '85-86

(e) None of these

15. In how many of the given years, did the foreign securities cross Rs. 2,800 crore mark?

(a) 3 years   (b) 4 years

(c) 2 years   (d) 5 years

(e) 1 year

16. If value of the gold coins (which form a part of gold) exceeded that of other gold (except gold coins) by 50% in 1980-81, then what was the value of gold coins?

(a) Rs. 274 crore   (b) Rs. 164 crore

(c) Rs. 292 crore   (d) Rs. 183 crore

(e) Rs. 246 crore.

17. If in 1990-91, a US Dollar is worth Seventeen Indian rupees, what was India's foreign securities in terms of US Dollar in that year?

(a) Rs. 2230 million   (b) Rs. 258 crores

(c) Rs. 210 crore   (d) Rs. 2.45 billion

(e) None of these

Directions for questions 18 to 22: Answer the questions on the basis of the information given below.

The 2006 batch of a premier B- school in India fared poorly in the three courses namely Statistics, Economics and Business Maths in their first semester examinations. The batch was divided into four sections A, B, C and D and every student in the batch wrote the examination on each of the three mentioned courses. The following bar graph provides information about the number of students who failed in each of the courses in the four sections. It also provides information about the total number of students and the number of students who failed in two courses in each of the four sections. No student failed in all the three courses.
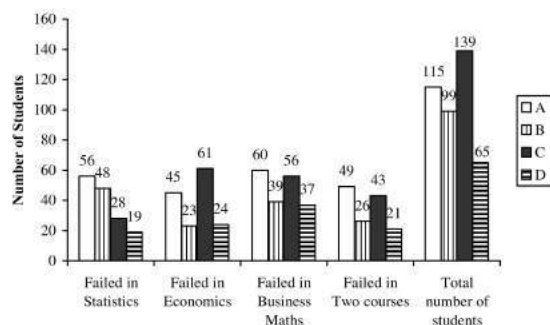

18. In section A, how many students failed in only one course?

(a) 61   (b) 62

(c) 63   (d) 64

(e) 65

19. In section C, how many students failed in atleast one course?

(a) 102   (b) 96

(c) 95   (d) 107

(e) 89

20. How many students in the 2006 batch passed in all the three courses?

(a) 58   (b) 61

(c) 62   (d) 64

(e) 67

21. Across all the four sections at least how many students did not fail only in Statistics?

(a) 271   (b) 279

(c) 261   (d) 275

(e) 274

22. Across all the four sections at most how many students passed in both Statistics and Business Maths?

(a) 121   (b) 136

(c) 153   (d) 197

(e) 217

Level - 3

Directions for questions 23 to 27: Answer the questions on the basis of the information given below.

In a particular batch of an Engineering college, there are 90 students each in four different departments viz. ECE, CSE, ME and EE. The IT department has only 60 students. The following graph shows the number of students passed and failed in the English paper of the second semester examination. It also shows the number of students who applied for re-evaluation of the same paper. Only the students who initially failed in the paper, were eligible to apply for a re-evaluation. After re-evaluation, some students passed while the others could not passed even after the re-evaluation. All the failed students along with the absentees have to clear the English paper next year. The number of passed and failed students, as captured in the following bar-chart, only indicate the situation before re-evaluation. The passed and failed students taken together indicate the number of students who appeared in that paper. Difference, if any, between the total number and the appeared number of students from any department is due to the absentees.
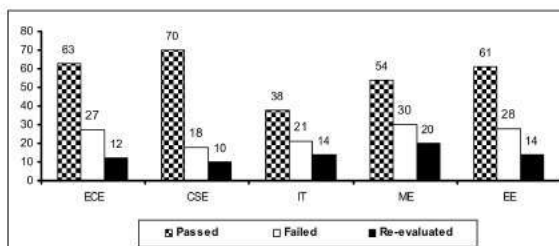
23. What is the pass percentage of all the streams taken together before re-evaluation ?

(a) 66.5%   (b) 69.3%

(c) 64.7%   (d) 68.1%

(e) 63.7%

24. If less than 70% of the students who applied for re-evaluation, pass after re-evaluation from each department, then for which department the ratio of passed students to failed students is the maximum after the re-evaluation?

(a) ECE   (b) CSE

(c) ME   (d) IT

(e) Cannot be determined

Additional information for Questions 25 to 27: From each department, 50% of the students who applied for re-evaluation failed even after re-evaluation.

25. For which department, the percentage of failed students with respect to the total number of students is the minimum after the re-evaluation?

(a) ECE   (b) CSE

(c) IT   (d) ME

(e) EE

26. How many students from this batch will have to clear the paper next year?

(a) 35   (b) 40

(c) 44   (d) 45

(e) Cannot be determined

27. How many students from ME department will appear in the English paper next year in that college?

(a) 106   (b) 90

(c) 96   (d) 116

(e) Cannot be determined

Directions for questions 28 to 32: Answer the questions on the basis of the information given below.

In the Presidential Election of the country called 'Incredible', only the members of the elected councils are eligible to vote. There are two types of elected councils in that country, the state-level elected council called the 'Assembly' and the central level elected council called the 'Parliament'. The members of assembly are abbreviated as MA and members of parliament are abbreviated as MP. There are only two political parties in that country namely party B and party C. All the MAs and MPs belong to one of these parties. There are only three states namely State 1, State 2 and State 3 in Incredible. There are three different assemblies, one each in these three mentioned states.

The following bar-graph compiles the size of the assemblies and the parliament in terms of number of members. The difference in the number of members between two parties in any council is not more than 10% of the total number of members of that council. In no elected council, two parties have equal number of members. If in an elected council, number of members of a particular party is more than the other party, then the party is said to enjoy 'majority' in that council.
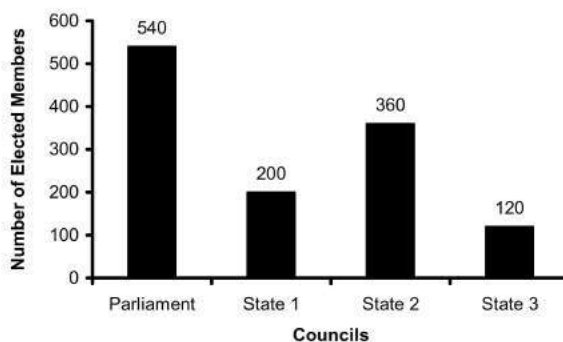
Mr. Shake and Ms. Pratt are the only two candidates for the presidential election of Incredible. Every MA and MP can either vote for any one of the mentioned candidates or can abstain from voting. Weight of vote of each MA from state 1, 2 and 3 are 3, 2 and 1 respectively whereas the weight of vote of each MP is 6. Every council members can vote only once in the Presidential elections.

Mr. Shake is supported by Party B and Ms. Pratt is supported by Party C. The word supported indicates that no elected council member from that party will vote for any candidate other than the 'supported' candidate, unless mentioned otherwise.

28. If all the council members belonging to party B vote for Mr. Shake, then which of the following can never be the total votes received by Ms. Pratt after due weight?

(a) 2580   (b) 2514

(c) 2250   (d) 2166

(e) 2106

29. If party C enjoyed majority in all the elected councils, then what is the minimum possible number of council members who should definitely abstain from voting such that Mr. Shake still wins the election?

(a) 270   (b) 269

(c) 268   (d) 267

(e) 266

30. Given that party B enjoys majority in all the state assemblies and Party C enjoys majority in the Parliament. Let 'X' be the maximum possible absolute difference between the total number of elected council members of party B and party C and 'Y' be the minimum possible absolute difference between the total number of elected council members of party B and party C. Find the value of $(X - Y)$.

(a) 62

(b) 64

(c) 56

(d) 52

(e) 60

31. Mr. Karl enters the fray as an Independent candidate and garners all the votes from elected council members from these three states. What is the maximum possible number of MPs, who vote for the candidates supported by their respective parties, such that Mr. Karl still manages to win the election?

(a) 478   (b) 269

(c) 271   (d) 538

(e) 519

32. Given that one party enjoys majority in two state assemblies and the other party enjoys majority in the other remaining state and the Parliament. If all the elected members vote for the candidate supported by their respective parties, then what can be the maximum possible difference in votes (after due weight) received by Ms. Pratt and Mr. Shake?

(a) 378   (b) 388

(c) 372   (d) 392

(e) 384

Directions for questions 33 to 37: Answer the questions on the basis of the information given below.

In the election for the post of General Secretary of a university, 10 students namely P, Q, R, S, T, U, V, X, Y and Z were contesting. The university had a total of 200 students. Each student was given a sheet of paper on which he/she had to write the name(s) of the candidate(s) of his/her choice. Each student could write a maximum of three names on a priority basis. The first name as his/her first choice, second name as his/her second choice and the third name as his/her third choice. Every student had to write at least one name on the sheet of paper. The following bar graph represents the information regarding the number of times the names of each of the 10 candidates were written on the sheets of paper. No student wrote on more than one sheet of paper and every student submitted the sheet of paper on which he/she had written the name(s) of the candidate(s).

A student could not write the name of a candidate as his/her second choice until and unless he/she had written the name of a candidate as his/her first choice. Similarly he/she could not write the name of candidate as his/her third choice until and unless he/she had written the names of candidates as his/her first and second choices respectively.
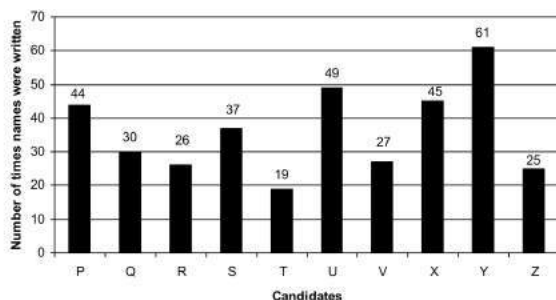
33. How many of the following values does not represent the number of students who wrote exactly one name on their respective sheet of paper?

A. 35   B. 36

C. 119   D. 109

E. 121

F. 118

(a) 1   (b) 2

(c) 3   (d) 4

(e) 5

34. What is the minimum possible number of students who wrote at least two names on their respective sheet of paper?

(a) 80   (b) 81

(c) 82   (d) 83

(e) 84

Additional Information for Questions 35 to 37: There are only three ways in which the name of a candidate could be written, viz. as first choice, second choice or third choice. Name of each of the 10 candidates was written in only one way. For example, P's name was written 44 times; in this case his name must have been written either 44 times as first choice or 44 times as second choice or 44 times as third choice. The names of candidates X and Y are always written as the first choice.

35. If the maximum possible number of students wrote exactly one name on their respective sheet of paper, then find the maximum possible number of times a particular name was written as the second choice.

(a) 49   (b) 30

(c) 37   (d) 44

(e) 27

36. Which of the following candidates is definitely not the first choice for the post of General Secretary as per any student?

(a) S   (b) R

(c) T   (d) Q

(e) P

37. If the minimum possible number of students wrote exactly one name on their respective sheet of paper, in such a case, consider the group of people whose names were written as the first choice. From this group, find the minimum possible number of times a particular name was written.

(a) 19   (b) 26

(c) 27   (d) 30

(e) 37

1. (b)	2. (a)	3. (b)	4. (a)	5. (e)	6. (a)	7. (d)	8. (b)	9. (a)	10. (e)
11. (b)	12. (a)	13. (a)	14. (a)	15. (a)	16. (e)	17. (d)	18. (c)	19. (a)	20. (b)
21. (e)	22. (d)	23. (d)	24. (d)	25. (b)	26. (d)	27. (d)	28. (a)	29. (d)	30. (a)
31. (e)	32. (b)	33. (d)	34. (c)	35. (b)	36. (e)	37. (a)			

SOLUTIONS

Level - 1

1. b

	Quantity in Litres		
	Lime Water	Water	Vitamins
Wired X	2.0	2.5	0.5
Blast	3.0	2	5
Bliss	1.6	3.2	3.2
Gorilla Juice	1.4	4.2	1.4
Zoom	0	4.0	6
XS Citrus	20	0	0
Wild Bull	5.0	2.5	2.5

10 L of Blast contains $10 \times \dfrac{30}{100}$ = 3 L lime water.

Percentage of lime water when Blast is mixed with

Wired X = $\dfrac{3+2}{15} \times 100 = 33.33\%$

Percentage of lime water when Blast is mixed with

Bliss = $\dfrac{3+1.6}{18} \times 100 = 25.55\%$

Percentage of lime water when Blast is mixed with

Gorilla Juice = $\dfrac{1.4+3}{17} \times 100 = 25.88\%$

Percentage of lime water when Blast is mixed with

Zoom = $\dfrac{3}{20} \times 100 = 15\%$

Percentage of lime water when Blast is mixed with

XS Citrus = $\dfrac{23}{30} \times 100 = 76.66\%$

Percentage of lime water when Blast is mixed with

Wild Bull = $\dfrac{5+3}{20} \times 100 = 40\%$

Hence, in 2 health drinks the concentration of lime water is more than 35% when they are mixed with available quantity of Blast.

2. a Total quantity of vitamins in mixture = 0.5 + 5 + 1.4

$= 6.9$ L

Total quantity of mixture = 5 + 10 + 7 = 22 L

∴ Required percentage = $\dfrac{6.9}{22} \times 100 = 31.36\%$

3. b Total quantity of Lime water in mixture

$= 2 + 3 + 1.6 + 1.4 + 0 + 20 + 5$

$= 33$ L

Total quantity of mixture

$= 5 + 10 + 8 + 7 + 10 + 20 + 10$

$= 70$ L

∴ Required percentage = $\dfrac{33}{70} \times 100 = 47.14\%$

4. a Required quantity = $5 \times \dfrac{10}{100} + 7 \times \dfrac{20}{100}$

$= .5 + 1.4 = 1.9$ litres

5. e Let quantity of all health drinks be 100 L

Concentration of lime water

$= \dfrac{40 + 30 + 20 + 20 + 0 + 100 + 50}{700} \times 100$

$= \dfrac{260}{700} \times 100 = 37.14\%$

For questions 6 to 8:

Let the marks scored by Andy, Bruce and Will be A, B and W respectively.

∴ $B - A = 7$ and $A + B + W = 39$

From above two equations, we get

$2A + W = 32$ and $2B + W = 46$

The possible values of A, B and W are:

$A = 12, 11, 10, 9, 8, 7$

$B = 19, 18, 17, 16, 15, 14$

$W = 8, 10, 12, 14, 16, 18$

6. a

7. d

8. b

9. a   1250 = 18%, then 100% = $\dfrac{1250 \times 100}{18}$

      = 6944 crore.

10. e   Cannot be determined as the price and sales of hardwares are not linked.

11. b   HP's sales of peripherals = 2500/7 = 357 crore.

     HP's share of peripheral market = 30.4%.

     Hence, total market = $\dfrac{357 \times 100}{30.4}$ = 1174 crore.

12. a   Revenues from consultancy services = 8% of 6945 crore.

     Revenues from PC servers = $\dfrac{357 \times 100}{30.9}$ = 1155.

     Hence, consultancy services as percentage of PC servers = 555.6/1155 × 100 = 48.1%.

13. a   **Approach 1:**

     (100 − 43.1)% of 357 + (100 − 48.1)% of 357 + ... (100 − 35.2)% of 357 = 56.9% of 357 + 51.9% of 357 + ... 64.8% of 357

     Approach 2:

       43.1 + 48.1 + ... 35.2 = 244.8

     If   244.8x = 2500(700 − 244.8)

     ∴   x = $\dfrac{2500 \times 455.2}{244.8}$ ≅ 4650 crore.

Level - 2

14. a   Average annual growth in assets during any period

     = $\dfrac{\text{Total growth in assets during the period}}{\text{Number of years in that period}}$

     ∴ Average annual growth during '70-71 to '80-81

     = $\dfrac{1}{10} \times \dfrac{13700 - 4222}{4222}$ × 100 = 22.5%

     Similarly,

     Average Annual growth from '80-81 to '90-91

     = $\dfrac{1}{10} \times \dfrac{46328 - 13700}{13700}$ × 100

     ≅ 24%

     Average annual growth from '50-51 to '80-81

     = $\dfrac{1}{30} \times \dfrac{13700 - 1259}{1259}$ × 100

     ≅ 33%

     Average annual growth from '70-71 to '85-86

     = $\dfrac{1}{15} \times \dfrac{22428 - 4222}{4222}$ × 100

     ≅ 29%

     Hence, the average annual growth is highest during '50-51 to '80-81 period.

15. a   Foreign securities for the given years.

Year	Foreign securities
'50-51	$\dfrac{55}{100}$ × 1259 ≅ 693
'70-71	$\dfrac{28}{100}$ × 4222 ≅ 1182
'80-81	$\dfrac{20}{100}$ × 13700 = 2740
'85-86	$\dfrac{13}{100}$ × 22428 ≅ 2916
'90-91	$\dfrac{9}{100}$ × 46328 ≅ 4170
'00-01	$\dfrac{14}{100}$ × 153834 = 21537

From this, it is evident that foreign securities were worth more than Rs. 2800 crore in last 3 years.

16. e   In 1980-81, value of gold

     = $\dfrac{3}{100}$ × 13700

     = 411 crores.

     ∴ Value of gold coins = $\dfrac{411}{2.5} \times 1.5$ = 246 crore.

17. d   India's foreign securities in 1990-91 in Indian rupees

     = $\dfrac{9}{100}$ × 46328 ≅ 4170 crores

     As, one US Dollar = 17 Indian rupees

     India's foreign secirities in terms of US Dollar

     = $\dfrac{4170}{17}$

     = 245 crores = 2.45 billion.

18. c   In Section A:

     Number of students who failed in only one course

         = (56 + 45 + 60 − 2 × 49) = 63

19. a   In Section C:

     Number of students who failed in at least one course

         = (28 + 61 + 56 − 2 × 43) + 43 = 102

20. b   In Section A:

     Number of such students

         = 115 − (56 + 45 + 60 − 49) = 3

     In Section B:

     Number of such students

         = 99 − (48 + 23 + 39 − 26) = 15

In Section C:

Number of such students

$$= 139 - (28 + 61 + 56 - 43) = 37$$

In Section D:

Number of such students

$$= 65 - (19 + 24 + 37 - 21) = 6$$

Therefore, total number of students that have passed in all the three courses

$$= 3 + 15 + 37 + 6 = 61$$

21. e In order to find the answer to the question we need to maximise the number of students who failed only in Statistics.

In Section A:

Out of the 49 students who failed in two courses, let us assume that 45 students failed in Economics and Business Maths.

This means that $49 - 45 = 4$ students failed in Statistics and Business Maths.

So, maximum possible number of students who failed only in Statistics $= 56 - 4 = 52$.

Therefore, at least $115 - 52 = 63$ students did not fail only in Statistics.

In Section B:

Following the same logic as given for Section A, at least $99 - (48 - (26 - 23)) = 99 - 45 = 54$ students did not fail only in Statistics.

In Section C:

Out of the 43 students who failed in two courses, let us assume that all 43 failed in Economics and Business Maths.

Therefore a maximum of 28 students failed only in Statistics.

So, at least $139 - 28 = 111$ students did not fail only in Statistics.

In Section D:

Out of the 21 students who failed in two courses, let us assume that all 21 failed in Economics and Business Maths.

Therefore a maximum of 19 students failed only in Statistics.

So, at least $65 - 19 = 46$ students did not fail only in Statistics.

So across all the four sections, at least $63 + 54 + 111 + 46 = 274$ students did not fail only in Statistics.

22. d No. of students who passed in Statistics and BM is Equivalent to no of students who failed only in Economics & the no of students who passed in all the three subjects.

In Section A:

Out of the 49 students who failed in two courses, let us assume that 49 students failed in BM & Statistics.

Maximum possible no. of students who failed only on Economics is 45.

In Section B:

Similarly in section B maximum possible no of students who failed only in Economics is 23.

In Section C:

Out of the 43 students who failed in two courses, let us assume that 28 students failed in BM & Statistics.

This means that $43 - 28 = 15$ students failed in Economics and one of the other course.

Maximum possible no. of students who failed only on Economics is $61 - 15 = 46$

In Section D:

Following the same logic as given for section C, at most

$$(24 - (21 - 19)) = 22$$

So across all the four sections the no of students who passed in statistics & BM

$$= (45 + 23 + 46 + 22) + 61 = 197$$

Level - 3

23. d Pass percentage of the whole batch

$$= \frac{63 + 70 + 38 + 54 + 61}{90 + 90 + 60 + 90 + 90} \times 100$$

$$= \frac{286}{420} \times 100 = 68.1\%$$

24. d Maximum number of additional students passed from ECE is less than 70% of $12 \approx 8$

Maximum number of additional students passed from CSE is less than 70% of $10 = 6$

Maximum number of additional students passed from IT is less than 70% of $14 \approx 9$

Maximum number of additional students passed from ME is less than 70% of $20 \approx 13$

Maximum number of additional students passed from EE is less than 70% of $14 \approx 9$

Passed students in ECE $= 63 + 8 = 71$

Passed students in CSE $= 70 + 6 = 76$

Passed students in IT $= 38 + 9 = 47$

Passed students in ME $= 54 + 13 = 67$

Passed students in EE $= 61 + 9 = 70$

Ratio of passed students to failed students for ECE $= 71 : 19$

Ratio of passed students to failed students for CSE $= 76 : 12$

Ratio of passed students to failed students for IT = 47 : 12

Ratio of passed students to failed students for ME = 67 : 17

Ratio of passed students to failed students for EE = 70 : 19

Clearly ratio is the maximum for CSE in this case. But if we assume that no additional student passed from CSE, then the ratio is maximum for ME department.

So correct answer is option (4).

25. b Failed students in ECE = 27 – 6 = 21

Failed students in CSE = 18 – 5 = 13

Failed students in IT = 21 – 7 = 14

Failed students in ME = 30 – 10 = 20

Failed students in EE = 28 – 7 = 21

Failed percentage in ECE = $\frac{21}{90} \times 100 = 23.3\%$

Failed percentage in CSE = $\frac{13}{90} \times 100 = 14.4\%$

Failed percentage in IT = $\frac{14}{60} \times 100 = 23.3\%$

Failed percentage in ME = $\frac{20}{90} \times 100 = 22.2\%$

Failed percentage in EE = $\frac{21}{90} \times 100 = 23.3\%$

Minimum percentage of failed students is from CSE.

26. d Total students who applied for re-evaluation = 12 + 10 + 14 + 20 + 14 = 70

Number of student who passed after re-evaluation = 0.5 × 70 = 35

Total number of students who should appear next year = failed + absentees = 35 + (2 + 1 + 6 + 1) = 45

27. d It is not known how many students will be there next year for this paper, as then new batch will be appearing for the paper also. It is not clear whether the new batch strength of ME will be 90 or not.

For questions 28 to 32:

	Parliament	State 1	State 2	State 3
Weight	6	3	2	1
Maximum possible member belonging to a party	297	110	198	66
Minimum possible member belonging to a party	243	90	162	54
Total	540	200	360	120

28. a Maximum Possible votes that one candidate can get

= 297 × 6 + 110 × 3 + 198 × 2 + 66 × 1 = 2574

Minimum Possible votes that one candidate can get

= 243 × 6 + 90 × 3 + 162 × 2 + 54 × 1 = 2106

So, the votes received by any candidate lies between 2106 and 2574. (both inclusive)

So the votes received by Ms. Pratt must be within this range. Clearly option (1) is not in this range.

29. d Since Mr. Shake wins the election we will take the composition of members in the elected councils such that party C enjoys maximum majority in each of the elected councils.

	Parliament	State 1	State 2	State 3
Weight	6	3	2	1
Party C	297	110	198	66
Party B	243	90	162	54
Total	540	200	360	120

If all the council members of party C in states 2 and 3 abstain from voting, then the difference between total votes (after due weight) of party C and party B is (54 × 6 + 20 × 3) – (162 × 2 + 54 × 1) = 384 – 378 = 6.

Now if another three council members of party C in state 1 abstain from voting then the total votes (after due weight) of party B is 9 – 6 = 3 more than the total votes (after due weight) of party C and hence Mr. Shake wins the election.

Therefore minimum possible number of council members who should definitely abstain from voting such that Mr. Shake still wins the election

= 198 + 66 + 3 = 267.

30. a **Case I :** Difference between the council members of party B and party C is minimum possible.

	Parliament	State 1	State 2	State 3
Weight	6	3	2	1
Party C	273	99	179	59
Party B	267	101	181	61
Total	540	200	360	120

Therefore,   Y = 2 + 2 + 2 – 6 = 0

Case II : Difference between the council members of party B and party C is maximum possible.

	Parliament	State 1	State 2	State 3
Weight	6	3	2	1
Party C	271	90	162	54
Party B	269	110	198	66
Total	540	200	360	120

Therefore,   X = 12 + 36 + 20 – 2 = 66

∴ (X – Y) = 66 – 4 = 62

31. e Mr. Karl got all the votes from the Assemblies. That means he already got (200 × 3 + 360 × 2 + 120 × 1) = 1440 votes.

The maximum number of MPs, who voted for the candidates supported by their respective parties, such that Mr. Karl still manages to win the election, will be in the following case:

	Party B	Party C	Mr. Karl
Number of MPs voted for	260	259	21
Value of the vote after due weight	1560	1554	126

In this case Karl gets (1440 + 126) = 1566 votes, and wins the election.

The maximum possible number of MPs, who voted for the candidates supported by their respective parties is (260 + 259) = 519

32. b For maximum possible difference in votes (after due weight) the possible combination of states in which one party enjoys majority is state 1 and state 3 and the other party enjoys majority in the parliament and state 2.

Maximum possible difference in votes (after due weight) = (54 × 6 + 36 × 2) – (2 × 3 + 2 × 1)

= 396 – 8 = 388.

For questions 33 to 37:

Let a, b and c denote the number of the students who wrote exactly one, two and three names on their respective sheet of paper respectively.

Therefore a + 2b + 3c = 363 and a + b + c = 200.

Or, b + 2c = 163.

Possible Values of c: 0, 1, 2, 3 …and goes till 81

Corresponding values of b: 163, 161, 159, 157 … and goes till 1.

Corresponding values of a: 37, 38, 39 … and goes till 118.

33. d Possible number of students who wrote exactly one name on their sheet of paper can be between 37 and 118 (both inclusive). Only 109 and 118 lie within the permissible limits.

34. c Minimum possible number of students who wrote at least two names on their respective sheets of paper = minimum of (b + c) = 81 + 1 = 82.

For questions 35 to 37:

If a student writes the name of any candidate, it is always written as a particular choice for the post of General Secretary and the names of candidate X and Y are always written as the first choice.

Names of X and Y are written 45 and 61 times respectively. So remaining number of choices for the first position left = 200 – (61 + 45) = 94.

There are only two cases possible since the name of a candidate is always written as a particular choice.

Case 1: When X (45), Y (61), Q (30), S (37) and V (27) are the candidates whose names were written as the first choice and P (44), R (26), T (19), U (25) and Z (49) were for the remaining two choices.

Case 2: When X (45), Y (61), Z (49), R (26) and T (19) are the candidates whose names were written as the first choice and P (44), S (37), Q (30), V (27) and U (25) were for the remaining two choices.

35. b If maximum possible number of students wrote exactly one name on their respective sheet of paper, then 118 students wrote exactly one name and 82 students wrote at least two names on their respective sheet of paper and 81 students wrote three names. Now we can refer to Case 2.

This is only possible when names of Q (30), V (27) and U (25) are always written as the second choice and names of P (44) and S (37) are written as the third choice.

So maximum number of times a name could be written as the second choice is that of Q = 30.

36. e Among the given options only P cannot be the first choice for the post of General Secretary.

37. a 37 is the minimum possible number of students who wrote exactly one name and correspondingly 163 students wrote exactly two names on their respective sheet of paper. In this case no student wrote three names. Now we can refer to Case 1 and 2.

Hence minimum number of times a particular name could be written as the first choice was that of T (19 times).
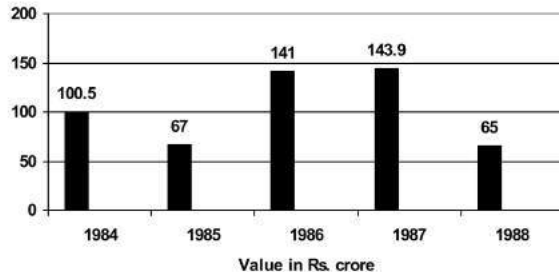
PREVIOUS YEARS QUESTIONS

LEVEL - 1

1990

Directions for Questions 1 to 3: *Answer the questions on the basis of the information given below.*

Project Exports: Contracts Secured

Value in Rs. crore

1. What is the average value of the contract secured during the years shown in the diagram?
   - (a) Rs. 103.48 crore
   - (b) Rs. 105 crore
   - (c) Rs. 100 crore
   - (d) Rs.125.2 crore

2. Compared to the performance in 1985 (i.e. taking it as the base), what can you say about the performances in the years '84, '85, '86, '87, '88 respectively, in percentage terms?
   - (a) 150, 100, 211, 216, 97
   - (b) 100, 67, 141,144,65
   - (c) 150, 100, 200, 215, 100
   - (d) 120, 100, 220, 230, 68

3. Which is the year in which the highest percentage decline is seen in the value of contract secured compared to the preceding year?
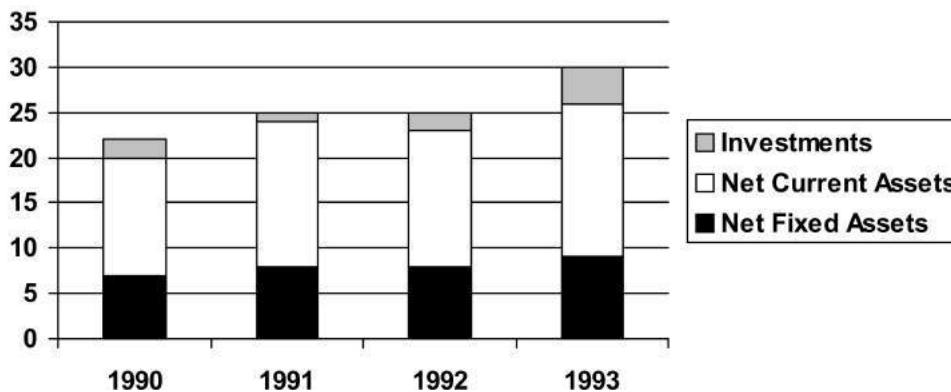   - (a) 1985
   - (b) 1988
   - (c) 1984
   - (d) 1986

1993

Directions for Questions 4 to 7: *Answer the questions on the basis of the information given below.*

Study the graph below and answer the questions.

Total Assets are defined as Net Fixed Assets + Net Current Assets + Investments

4. What is the approximate simple annual growth rate of Total Assets 1990 and 1993?
   - (a) 36%
   - (b) 12%
   - (c) 9%
   - (d) 27%

5. In any two consecutive years, the growth rate is lowest for
   - (a) Net Fixed Assets.
   - (b) Net Current Assets.
   - (c) Investments.
   - (d) Total Assets.

6. Between 1991 and 1992, the highest growth rate was seen for
   - (a) Net Fixed Assets
   - (b) Net Current Assets.
   - (c) Investments
   - (d) Total Assets.

7. The only item which has not shown a negative growth in every year between 1990 and 1993 is
   - (a) Net Fixed Assets.
   - (b) Net Current Assets.
   - (c) Investments.
   - (d) Total Assets.

**Directions for Questions 8 to 11:** *Answer the questions on the basis of the information given below.*

Number of Engineering Students (in hundreds) at institutions of different kinds

☒ Private Engg. College   ■ Govt. Engg. College

☐ Regional Engg. College   ▨ IITS

Year
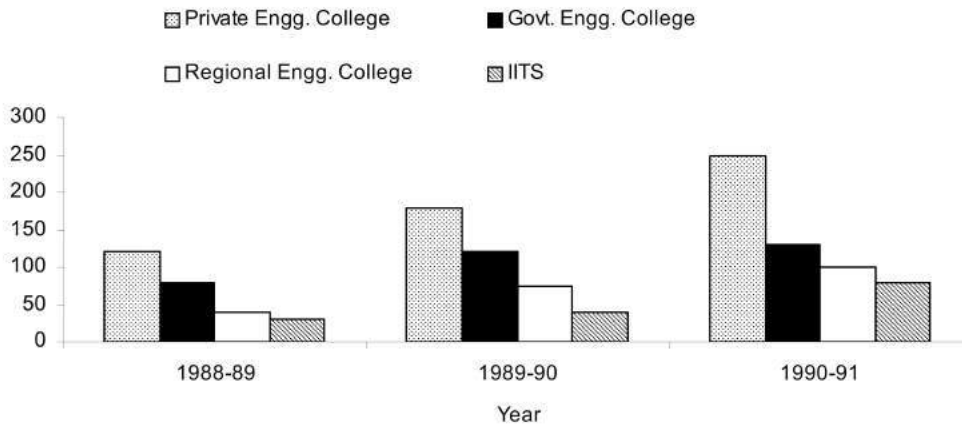
8. What was the total number of engineering students in 1989 – 90?

  (a) 28500   (b) 4400

  (c) 4200   (d) 42000

9. The growth rate in students of Govt. Engg. Colleges compared to that of Private Engg. Colleges between 1988 – 89 and 1989 – 90 is

  (a) more   (b) less

  (c) equal   (d) $\frac{3}{2}$

10. The total number of Engg. Students in 1991 – 92, assuming a 10% reduction in the number over the previous year, is

  (a) 5700   (b) 57000

  (c) 44800   (d) none of these

11. In 1990 – 91, what percent of Engg. Students were studying at IIT's?

  (a) 16   (b) 15

  (c) 14   (d) 12

Directions for Questions 12 to 16: *Answer the question on the basis of the information given below.*

Foreign trade (in billion dollars)
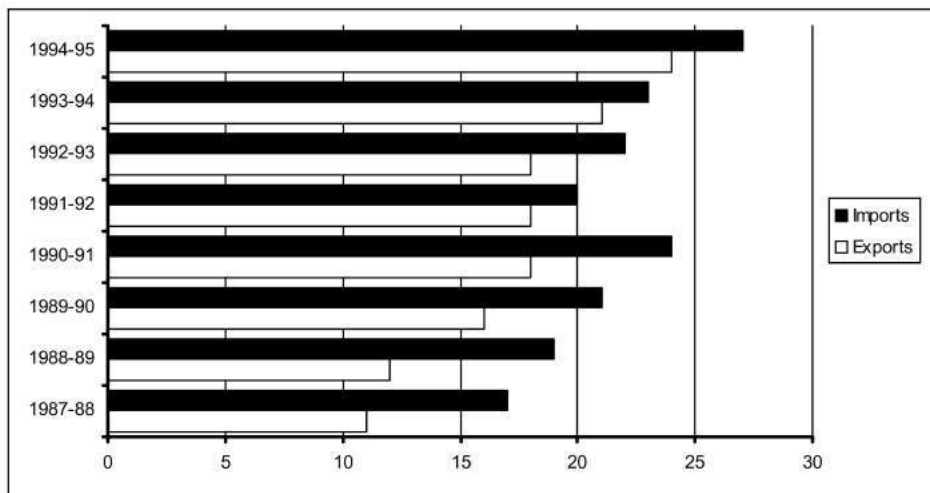
12. In which year was the trade deficit highest?

  (a) 1987-88   (b) 1988-89

  (c) 1989-90   (d) 1990-91

13. In how many years was the trade deficit less than the trade deficit in the succeeding year?

  (a) 1   (b) 2

  (c) 3   (d) 4

14. Export earning in 1990-91 is how many per cent of imports in 1991-92?

(a) 82%

(b) 85%

(c) 90%

(d) 15%

15. In the last three years, the total export earnings have accounted for how many per cent of the value of the imports?

(a) 80%

(b) 83%

(c) 95%

(d) 88%

16. Which of the following statements can be inferred from the graph?

I. In all the years shown in the graph, the trade deficit is less than the export earning.

II. Export earnings increased in every year between 1989-90 and 1991-92.

III. In all the years shown in the graph, the earning by exports is less than the expenditure on imports in the preceding year.

(a) I only

(b) II only

(c) III only

(d) I and III only

Directions for Questions 17 to 21: *Answer the questions on the basis of the information given below.*

Revenue obtained by a publishing house while selling books, magazines and journals (Rs.in lakh).
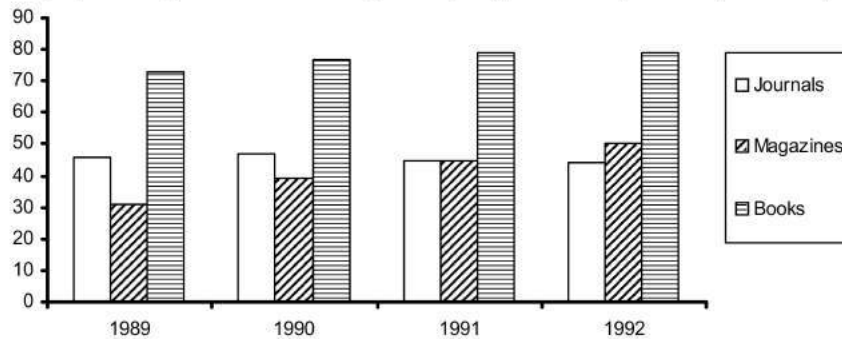
17. Which year shows the highest change in revenue obtained from journals?

(a) 1989

(b) 1990

(c) 1991

(d) 1992

18. In 1992, what per cent of the total revenue came from books?

(a) 45%

(b) 55%

(c) 35%

(d) 25%

19. The number of years in which there was an increase in revenue from at least two categories is

(a) 1

(b) 2

(c) 3

(d) 4

20. If 1993 were to show the same growth as 1992 over 1991, the revenue in 1993 must be
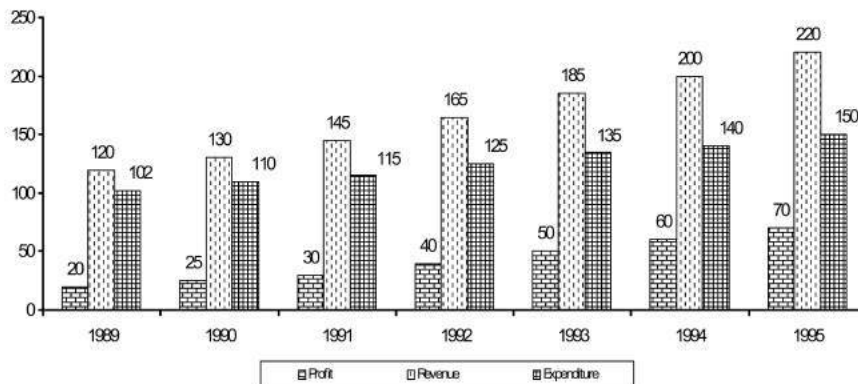
(a) Rs.194 lakh

(b) Rs.187 lakh

(c) Rs.172 lakh

(d) Rs.177 lakh

21. The growth in total revenue from 1989 to 1992 is

(a) 21%

(b) 28%

(c) 15%

(d) 11%

1996

Directions for Questions 22 to 26: *Answer the questions on the basis of the information given below.*

22. The average revenue collected in the given 7 years is approximately

(a) Rs. 164 lakh   (b) Rs. 168 lakh

(c) Rs. 171 lakh   (d) Rs. 175 lakh

23. The expenditure for the 7 years together form what per cent of the revenues during the same period?

(a) 75%   (b) 67%

(c) 62%   (d) 83%

24. Which year showed the greatest percentage increase in profit as compared to the previous year?

(a) 1993   (b) 1994

(c) 1990   (d) 1992

25. In which year was the growth in expenditure maximum as compared to the previous year?

(a) 1993   (b) 1995

(c) 1991   (d) 1992

26. If the profit in 1996 shows the annual rate of growth as it had shown in 1995 over the previous year, then what approximately will be the profit in 1996?

(a) Rs. 72 lakh   (b) Rs. 82 lakh

(c) Rs. 93 lakh   (d) Rs. 78 lakh

1997

Directions for Questions 27 to 32: *Answer the questions on the basis of the information given below.*

The graph given below gives the yearly details of money invested in producing a certain product over the years 1991 to 1995. It also gives the profit (in '000 rupees).
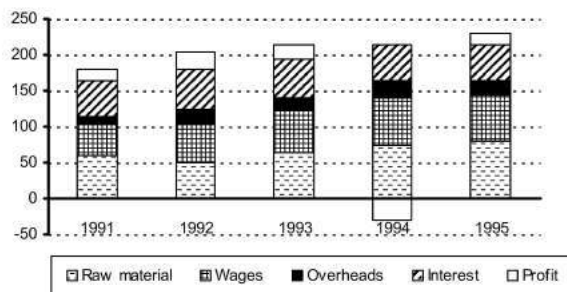
27. In which year was the increase in raw material maximum?

(a) 1992   (b) 1993

(c) 1994   (d) 1995

28. In which period was the change in profit maximum?

(a) 1991-92   (b) 1992-93

(c) 1993-94   (d) 1994-95

29. Which component of the cost production has remained more or less constant over the period?

(a) Interest   (b) Overheads

(c) Wages   (d) Raw material

30. In which year were the overheads, as a percentage of the raw material, maximum?

(a) 1995   (b) 1994

(c) 1992   (d) 1993

31. What percentage of the costs did the profits form over the period?

(a) 3%   (b) 5%

(c) 8%   (d) 11%

32. If the interest component is not included in the total cost calculation, which year would show the maximum profit per unit cost?

(a) 1991   (b) 1992

(c) 1993   (d) 1995

2001

Directions for Questions 33 to 38: *Answer the questions based on the two graphs shown below.*

Figure I shows the amount of work distribution, in man-hours, for a software company between offshore and onsite activities. Figure 2 shows the estimated and actual work effort involved in the different offshore activities in the same company during the same period. [**Note:** Onsite refers to work performed at the customer's premise and offshore refers to work performed at the developer's premise.]
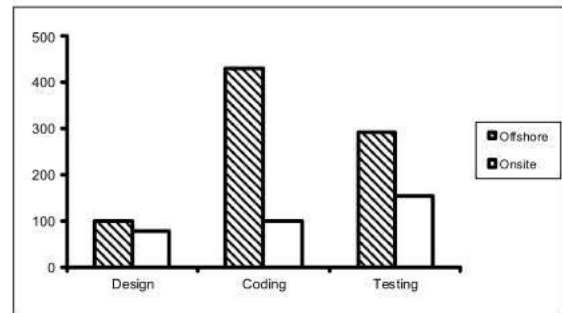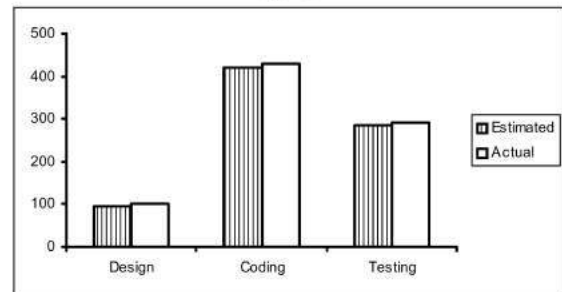

Figure 1

Figure 2

33. Which work requires as many man-hours as that spent in coding?

(a) Offshore, design and coding

(b) Offshore coding

(c) Testing

(d) Offshore, testing and coding

34. Roughly, what percentage of the total work is carried out onsite?

(a) 40% (b) 20 %

(c) 30 % (d) 10 %

35. The total effort in man-hours spent onsite is nearest to which of the following?

(a) The sum of the estimated and actual effort for offshore design.

(b) The estimated man-hours of offshore coding.

(c) The actual man-hours of offshore testing.

(d) Half of the man-hours of estimated offshore coding.

36. If the total working hours were 100, which of the following tasks will account for approximately 50 hr?

(a) Coding

(b) Design

(c) Offshore testing

(d) Offshore testing plus design

37. If 50% of the offshore work were to be carried out onsite, with the distribution of effort between the tasks remaining the same, the proportion of testing carried out offshore would be

(a) 40% (b) 30%

(c) 50% (d) 70%

38. If 50% of the offshore work were to be carried out onsite, with the distribution of effort between the tasks remaining the same, which of the following is true of all work carried out onsite?

(a) The amount of coding done is greater than that of testing.

(b) The amount of coding done onsite is less than that of design done onsite.

(c) The amount of design carried out onsite is greater than that of testing.

(d) The amount of testing carried out offshore is greater than that of total design.

Directions for Questions 39 to 41: *Answer these questions based on the data given below:*

There are six companies, 1 through 6. All of these companies use six operations, A through F. The following graph shows the distribution of efforts put in by each company in these six operations.
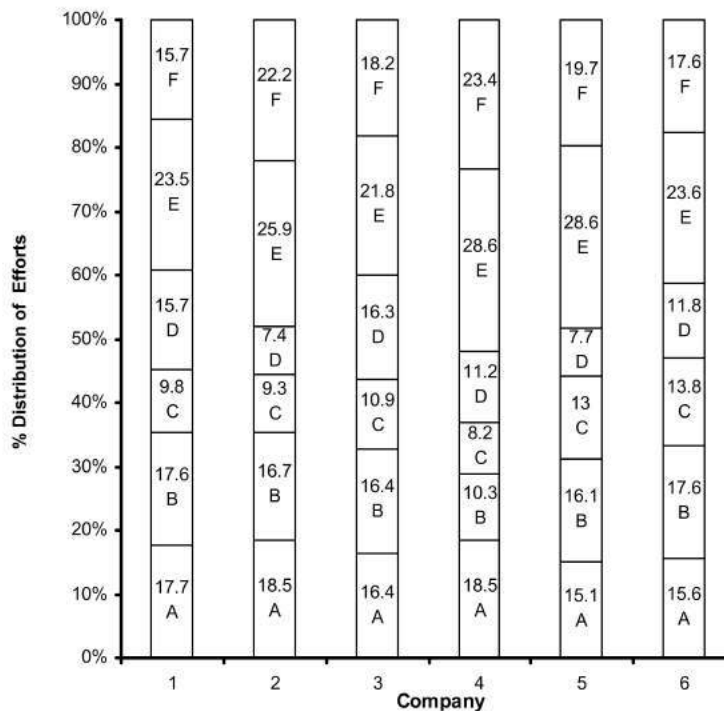
39. Suppose effort allocation is inter-changed between operations B and C, then C and D, and then D and E. If companies are then ranked in ascending order of effort in E, what will be the rank of company 3?

(a) 2 (b) 3

(c) 4 (d) 5

40. A new technology is introduced in company 4 such that the total effort for operations B through F get evenly distributed among these. What is the change in the percentage of effort in operation E?

(a) Reduction of 12.3 (b) Increase of 12.3

(c) Reduction of 5.6 (d) Increase of 5.6

41. Suppose the companies find that they can remove operations B, C and D and redistribute the effort released equally among the remaining operations. Then which operation will show the maximum across all companies and all operations?

(a) Operation E in company 1

(b) Operation E in company 4

(c) Operation F in company 5

(d) Operation E in company 5

2002

Directions for Questions 42 to 47: *Answer the questions based on the chart given below.*

The chart given below indicates the annual sales tax revenue collections (in rupees in crores) of seven states from 1997 to 2001. The values given at the top of each bar represents the total collections in that year.
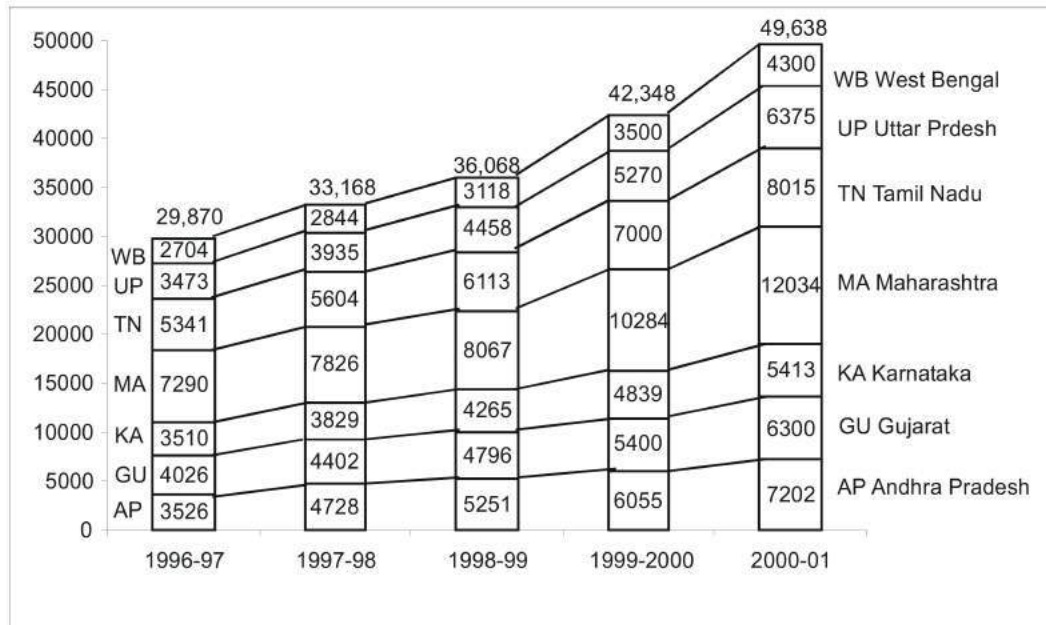
42. If for each year, the states are ranked in terms of the descending order of sales tax collections, how many states do not change the ranking more than once over the five years?

(a) 1

(b) 5

(c) 3

(d) 4

43. Which of the following states has changed its relative ranking most number of times when you rank the states in terms of the descending volume of sales tax collections each year?

(a) Andhra Pradesh

(b) Uttar Pradesh

(c) Karnataka

(d) Tamil Nadu

44. The percentage share of sales tax revenue of which state has increased from 1997 to 2001?

(a) Tamil Nadu

(b) Karnataka

(c) Gujarat

(d) Andhra Pradesh

45. Which pair of successive years shows the maximum growth rate of tax revenue in Maharashtra?

(a) 1997 to 1998

(b) 1998 to 1999

(c) 1999 to 2000

(d) 2000 to 2001

46. Identify the state whose tax revenue increased exactly by the same amount in two successive pair of years?

(a) Karnataka

(b) West Bengal

(c) Uttar Pradesh

(d) Tamil Nadu

47. Which state below has been maintaining a constant rank over the years in terms of its contribution to total tax collections?

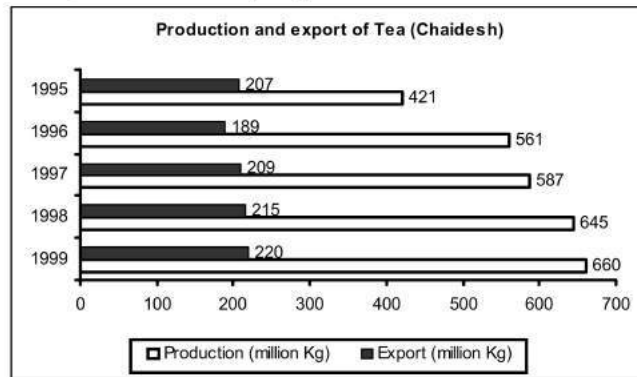(a) Andhra Pradesh

(b) Karnataka

(c) Tamil Nadu

(d) Uttar Pradesh

Directions for Questions 48 to 50: *Answer the questions on the basis of the following charts.*

Per Capita Availability of Tea (gm) in Chaidesh
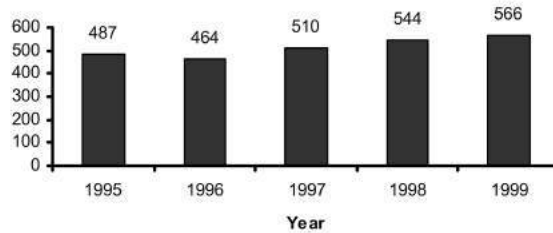
(**Note:** Availability is defined as production less export.)

Production and export of Tea (Chaidesh)

□ Production (million Kg) ■ Export (million Kg)

48. In which year during the period 1996-1999 was Chaidesh's export of tea, as a proportion of tea produced, the highest?

(a) 1996　　　　　(b) 1997
(c) 1998　　　　　(d) 1999

49. In which of the following years was the population of Chaidesh the lowest?

(a) 1995　　　　　(b) 1996
(c) 1997　　　　　(d) 1999

50. The area under tea cultivation continuously decreased in all four years from 1996 to 1999, by 10%, 7%, 4%, and 1%, respectively. In which year was tea productivity (production per unit of area) the highest?

(a) 1999
(b) 1998
(c) 1997
(d) 1996

Directions for Questions 51 and 52: Answer the questions on the basis of the data presented in the figure below.

Rainfall at Selected Locations in Certain Months

■ March □ April ▧ September ▦ November
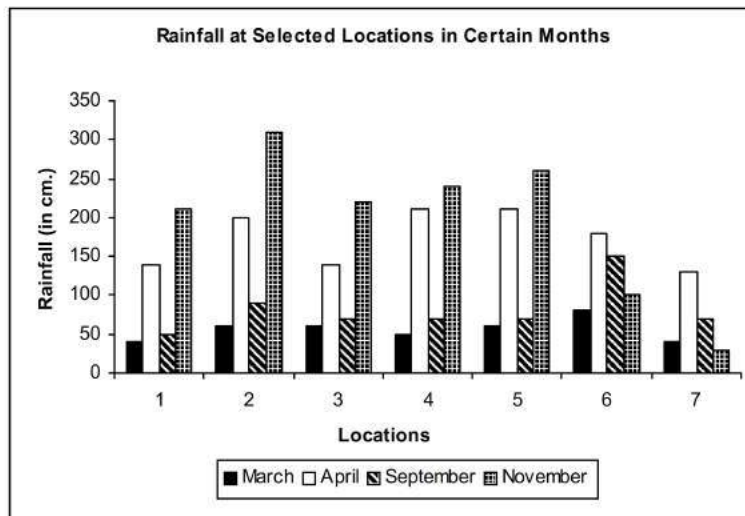
51. Which of the following statements is correct?

(a) November rainfall exceeds 100 cm in each location.

(b) September rainfall exceeds 50 cm in each location.

(c) March rainfall is lower than September rainfall in each location.

(d) None of these.

**52.** Locations 6 and 7 differ from all the rest because only in these two locations,

(a) April rainfall exceeds March rainfall.

(b) Peak rainfall occurs in April.

(c) November rainfall is lower than March rainfall.

(d) April rainfall is less than 200 cm.

MEMORY BASED QUESTIONS

2010

Directions for questions 53 and 54 : *Answer the questions on the basis of the information given below.*

The graph given below shows the total Exports and Imports of a country for four different years.
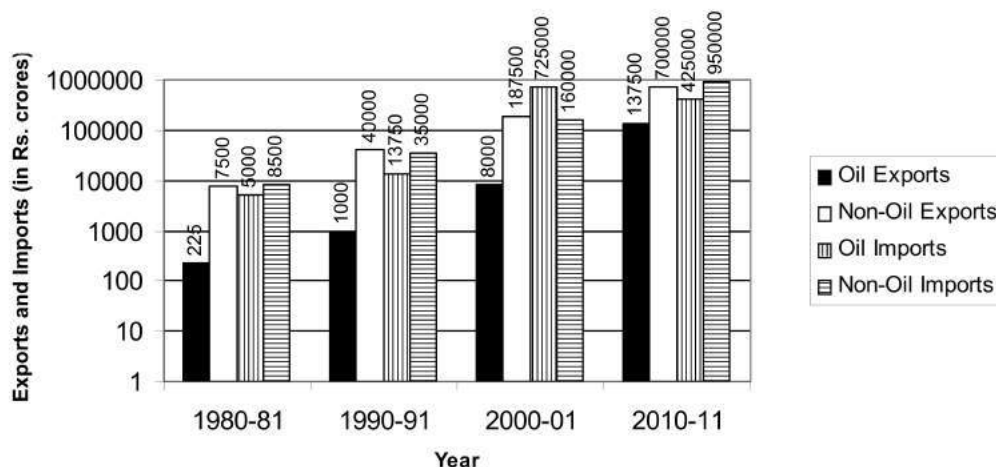
Please note:

(i) Total Exports is the sum of Oil Exports and Non-Oil Exports.

(ii) Total Imports is the sum of Oil Imports and Non-Oil Imports.

(iii) Oil Trade Balance is the surplus of Oil Exports over Oil Imports.

(iv) Non-Oil Trade Balance is the surplus of Non-Oil Exports over Non-Oil Imports.

(v) Total Trade Balance is the sum of Oil Trade Balance and Non-Oil Trade Balance.

53. Which of the following experiences the highest increase?

(a) Oil Exports from 2000-01 to 2010-11.

(b) Oil Imports from 1990-91 to 2000-01.

(c) Oil Trade Balance from 1990-91 to 2000-01.

(d) Total Trade Balance from 1990-91 to 2000-01

54. Which of the following experiences the lowest percentage change?

(a) Non-Oil Exports from 2000-01 to 2010-11.

(b) Total Exports from 1990-91 to 2000-01.

(c) Oil Imports from 1980-81 to 1990-91.

(d) Total Imports from 2000-01 to 2010-11.

2011

Directions for questions 55 to 57: *Answer the questions on the basis of the information given below.*

Bar Graph - I shows the month-wise total sales (in '00 units) of cars by Naruti Kuzuki Ltd. from April 2010 to July 2010. Bar Graph - II shows the sales (in '000 units) of four of the car models – Ken, Sezire, Palto and Dwift – of Naruti Kuzuki Ltd. in the four months.
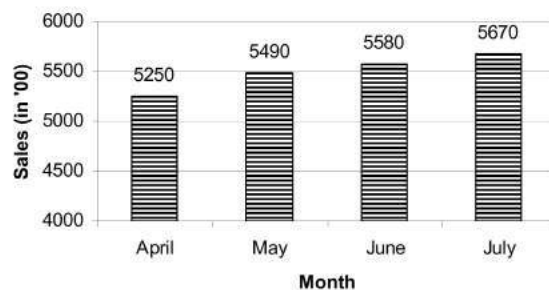
Graph - I

Graph - II

55. For which of the four car models is the absolute percentage change in the sales from April 2010 to July 2010 equal to the absolute percentage change in the total sales of cars by Naruti Kuzuki Ltd. during the same period?

(a) Dwift

(b) Ken

(c) Sezire

(d) Palto

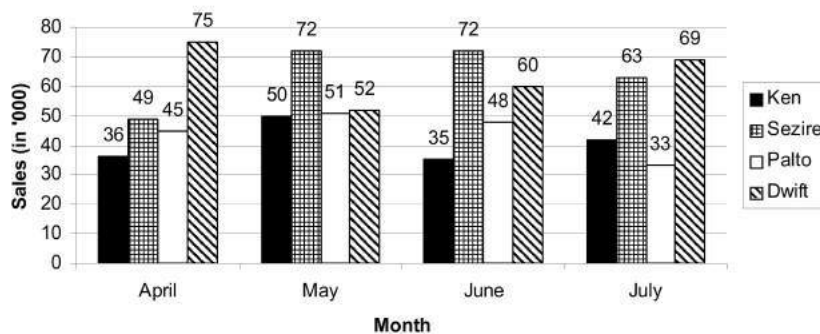**56.** What is the percentage increase in the sales of the rest of the car models (other than the given four) by Naruti Kuzuki Ltd. from May 2010 to July 2010?

(a) 7.5%   (b) 8%

(c) 9.09%   (d) None of these

57. For which month is the ratio of the sales of Sezire to the total sales of cars by Naruti Kuzuki Ltd. the highest?

(a) April   (b) May

(c) June   (d) July

2013

Directions for questions 58 to 60 : Answer the questions on the basis of the information given below.

The bar graphs given below show the gender-wise deaths (in '000) due to NCDs (Non Communicable Diseases) in five countries for the years 2008 and 2009.
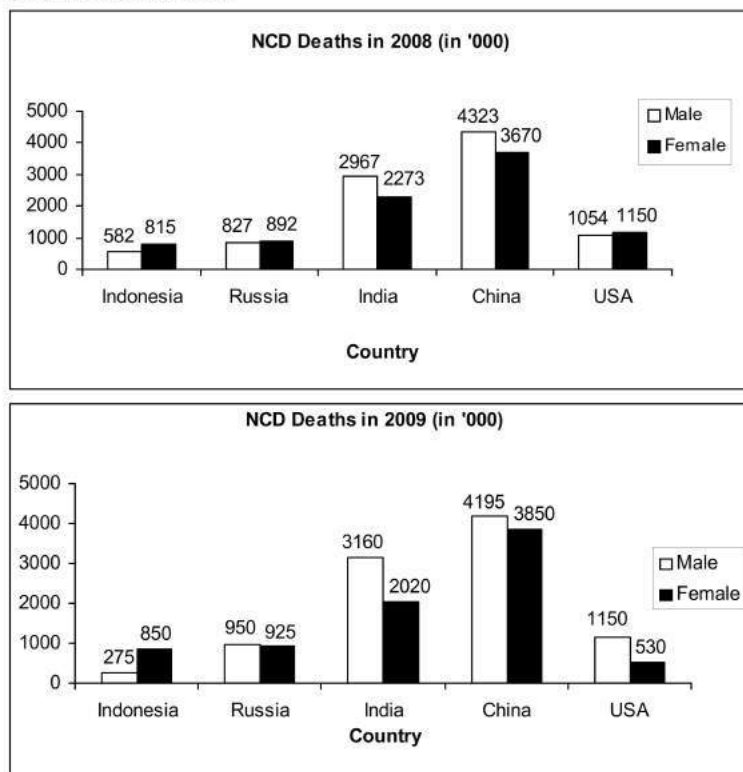
58. In how many countries was the number of deaths due to NCDs in 2009 less than that in 2008?

(a) 1   (b) 2

(c) 3   (d) 4

59. By what percent was the total number of female deaths due to NCDs in the five countries put together in 2009 more/less than that in 2008?

(a) 7.10   (b) 6.40

(c) 8.60   (d) 7.90

60. What was the absolute difference between the total number of male deaths due to NCDs in the five countries put together in 2008 and 2009?
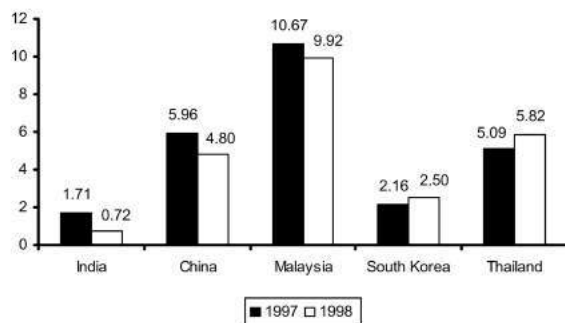
(a) 22500   (b) 23000

(c) 24000   (d) None of these

LEVEL - 2

2000

Directions for Questions 61 to 64: *Answer these questions based on the data presented in the figure below.*

FEI for a country in a year, is the ratio (expressed as a percentage) of its foreign equity inflows to its GDP. The following figure displays the FEIs for select Asian countries for 1997 and 1998.

61. The country with the highest percentage change in FEI in 1998 relative to its FEI in 1997, is

(a) India   (b) China

(c) Malaysia   (d) Thailand

62. Based on the data provided, it can be concluded that

(a) absolute value of foreign equity inflows in 1998 was higher than that in 1997 for both Thailand and South Korea.

(b) absolute value of foreign equity inflows was higher in 1998 for Thailand and lower for China than the corresponding values in 1997.

(c) absolute value of foreign equity inflows was lower in 1998 for both India and China than the corresponding values in 1997.

(d) None of the above can be inferred

63. It is known that China's GDP in 1998 was 7% higher than its value in 1997, while India's GDP grew by 2% during the same period. The GDP of South Korea, on the other hand, fell by 5%. Which of the following statements is/are true?

I. Foreign equity inflows to China were higher in 1998 than in 1997.

II. Foreign equity inflows to China were lower in 1998 than in 1997.

III. Foreign equity inflows to India were higher in 1998 than in 1997.

IV. Foreign equity inflows to South Korea decreased in 1998 relative to 1997.

V. Foreign equity inflows to South Korea increased in 1998 relative to 1997.

(a) I, III and IV   (b) II, III and IV

(c) I, III and V   (d) II and v

64. China's foreign equity inflows in 1998 were 10 times that of India. It can be concluded that

(a) China's GDP in 1998 was 40% higher than that of India

(b) China's GDP in 1998 was 70% higher than that of India

(c) China's GDP in 1998 was 50% higher than that of India

(d) no inference can be drawn about relative magnitudes of China's and India's GDPs

Directions for Questions 65 to 70: *Answer the questions based on the data given below.*

The figures below present annual growth rate, expressed as the percentage change relative to the previous year, in four sectors of the economy of the Republic of Reposia during the 9-year period from 1990 to 1998. Assume that the index of production for each of the four sectors is set at 100 in 1989. Further, the four sectors: manufacturing, mining and quarrying, electricity, and chemicals, respectively, constituted 20%, 15%, 10% and 15% of total industrial production in 1989.

Manufacturing
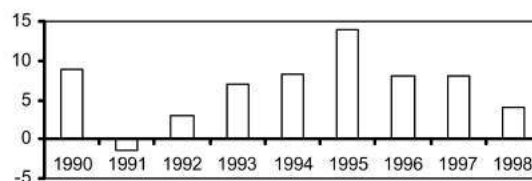
Mining and quarrying
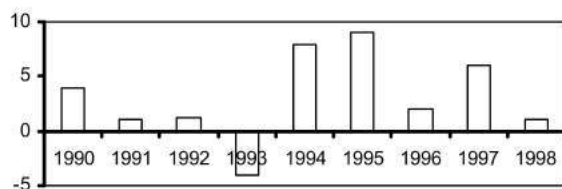
Electrical

Chemical

65. Which is the sector with the highest growth during the period 1989 to 1998?

(a) Manufacturing   (b) Mining and quarrying

(c) Electricity   (d) Chemical

66. The overall growth rate in 1991 of the four sectors together is approximately

(a) 10%   (b) 1%

(c) 2.5%   (d) 1.5%

67. When was the highest level of production in the manufacturing sector achieved during the 9-year period 1990-98?

(a) 1998   (b) 1995

(c) 1990   (d) Cannot be determined

68. When was the lowest level of production of the mining and quarrying sector achieved during the 9-year period 1990-98?

(a) 1996   (b) 1993

(c) 1990   (d) Cannot be determined

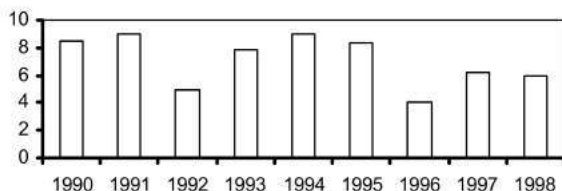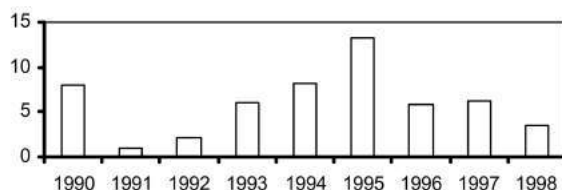**69.** The percentage increase of production in the four sectors, namely, manufacturing, mining and quarrying, electricity and chemicals, taken together in 1994, relative to 1989 is approximately

(a) 25%   (b) 20%

(c) 50%   (d) 40%

70. It is known that the index of total industrial production in 1994 was 50% more than that in 1989. Then, the percentage increase in production between 1989 and 1994 in sectors other than the four listed above is

(a) 57.5%   (b) 87.5%

(c) 127.5%   (d) 47.5%

2004

Directions for Questions 71 to 74: *Answer the questions on the basis of the information given below.*

Purana and Naya are two brands of kitchen mixer-grinders available in the local market. Purana is an old brand that was introduced in 1990, while Naya was introduced in 1997. For both these brands, 20% of the mixer-grinders bought in a particular year are disposed off as junk exactly two years later. It is known that 10 Purana mixer-grinders were disposed off in 1997. The following figures show the number of Purana and Naya mixer-grinders in operation from 1995 to 2000, as at the end of the year.
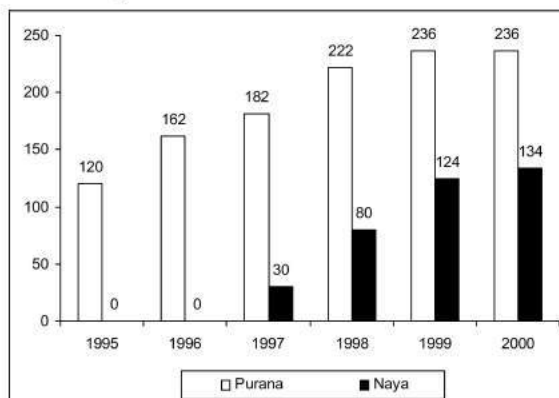
71. How many Naya mixer-grinders were purchased in 1999?

(a) 44   (b) 50

(c) 55   (d) 64

72. How many Naya mixer-grinders were disposed off by the end of 2000?

(a) 10

(b) 16

(c) 22

(d) Cannot be determined from the data

73. How many Purana mixer-grinders were disposed off in 2000?

(a) 0

(b) 5

(c) 6

(d) Cannot be determined from the data

74. How many Purana mixer-grinders were purchased in 1999?

    (a) 20

    (b) 23

    (c) 50

    (d) Cannot be determined from the data

2005

Directions for Questions 75 to 78: *Answer the questions on the basis of the information given below:*

A management institute was established on January 1, 2000 with 3, 4, 5, and 6 faculty members in the Marketing, Organisational Behaviour (OB), Finance, and Operations Management (OM) areas respectively, to start with. No faculty member retired or joined the institute in the first three months of the year 2000. In the next four years, the institute recruited one faculty member in each of the four areas. All these new faculty members, who joined the institute subsequently over the years, were 25 years old at the time of their joining the institute. All of them joined the institute on April 1. During these four years, one of the faculty members retired at the age of 60. The following diagram gives the area-wise average age (in terms of number of completed years) of faculty members as on April 1 of 2000, 2001, 2002, and 2003.
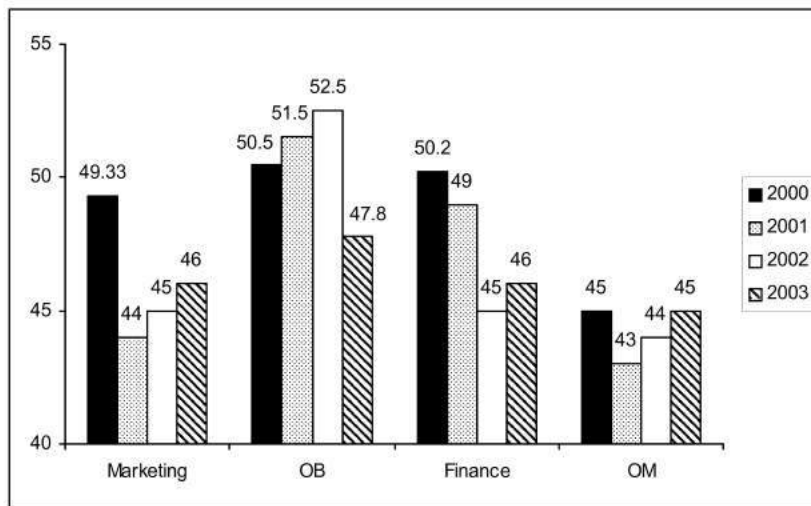
75. From which area did the faculty member retire?

    (a) Finance

    (b) Marketing

    (c) OB

    (d) OM

76. Professors Naresh and Devesh, two faculty members in the Marketing area, who have been with the Institute since its inception, share a birthday, which falls on 20th November. One was born in 1947 and the other one in 1950. On April 1 2005, what was the age of the third faculty member, who has been in the same area since inception?

    (a) 47   (b) 50

    (c) 51   (d) 52

77. In which year did the new faculty member join the Finance area?

    (a) 2000

    (b) 2001

    (c) 2002

    (d) 2003

78. What was the age of the new faculty member, who joined the OM area, as on April 1, 2003?

    (a) 25

    (b) 26

    (c) 27

    (d) 28

Directions for Questions 79 to 82: *Answer the following questions based on the information given below:*

The bar chart below shows the revenue received in million US Dollars (USD), from subscribers to a particular Internet service. The data covers the period 2003 to 2007 for the United States (US) and Europe. The bar chart also shows the estimated revenues from subscription to this service for the period 2008 to 2010.
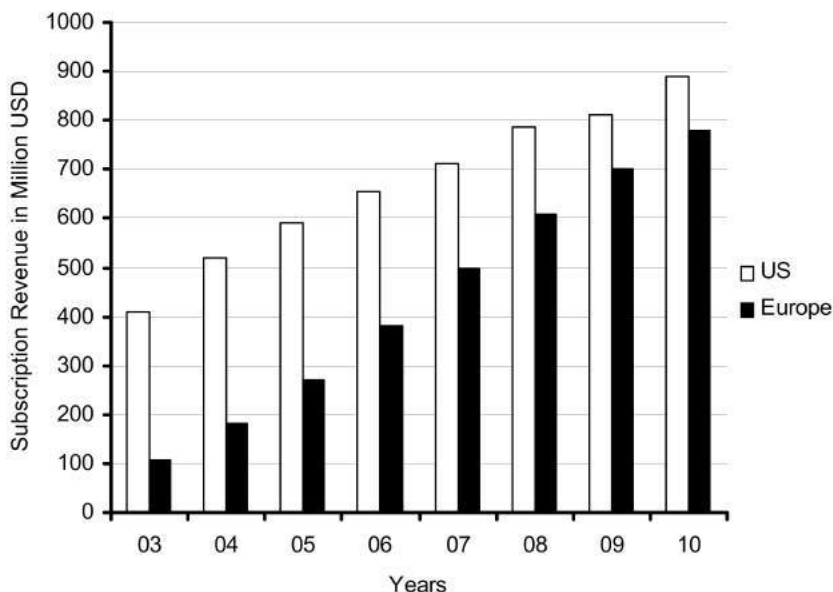
79. The difference between the estimated subscription in Europe in 2008 and what it would have been if it were computed using the percentage growth rate of 2007 (over 2006), is closest to:
    (a) 50   (b) 80
    (c) 20   (d) 10
    (e) 0

80. In 2003, sixty percent of subscribers in Europe were men. Given that women subscribers increase at the rate of 10 percent per annum and men at the rate of 5 percent per annum, what is the approximate percentage growth of subscribers between 2003 and 2010 in Europe? The subscription prices are volatile and may change each year.
    (a) 62   (b) 15
    (c) 78   (d) 84
    (e) 50

81. Consider the annual percent change in the gap between subscription revenues in the US and Europe. What is the year in which the absolute value of this change is the highest?
    (a) 03 - 04   (b) 05 - 06
    (c) 06 - 07   (d) 08 - 09
    (e) 09 - 10

82. While the subscription in Europe has been growing steadily towards that of the US, the growth rate in Europe seems to be declining. Which of the following is closest to the percent change in growth rate of 2007 (over 2006) relative to the growth rate of 2005 (over 2004)?
    (a) 17   (b) 20
    (c) 35   (d) 60
    (e) 100

MEMORY BASED QUESTIONS

Directions for Questions 83 to 85 : Answer the questions on the basis of the information given below.

The bar charts given below shows the details of the "Budgeted I-Tax" collections and the "Actual I-Tax" collections of India in each of the years from 2004-05 to 2008-09. Bar Chart-I shows the details of the **Total I-Tax** collections and bar chart-II shows the details of the **Corporate I-Tax** collections. There are only two categories of taxpayers in India "Individual Taxpayers" and "Corporate Taxpayers". All the figures are in Rs. crores.

Total I-Tax collections
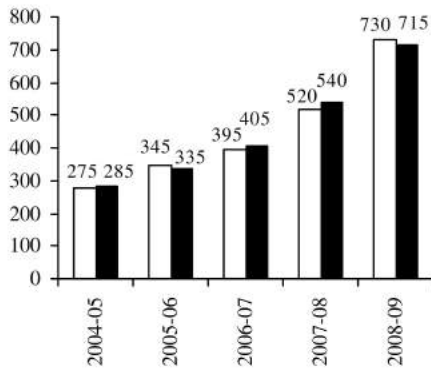
Chart I

Corporate I-Tax collections
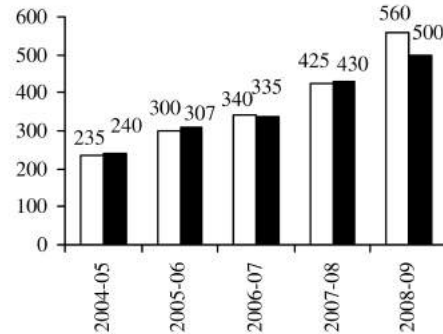
Chart II

☐ Budgeted ■ Actual

$$\text{Efficacy Ratio} = \left(\frac{\text{Budgeted I-Tax Collections}}{\text{Actual I-Tax Collections}} \right)$$

83. For how many of the given years the Efficacy Ratio of at least two out of "Total I-Tax" collections, "Corporate I-Tax" collections and "Individual I-Tax" collections is greater than 1?

(a) 0   (b) 1
(c) 2   (d) Data Insufficient

84. In which of the following years, for either of the Corporate I-Tax collections or the Total I-Tax collections, the percentage growth of I-Tax over the previous year for both the Budgeted and the Actual is approximately the same?

(a) 2005-06   (b) 2006-07
(c) 2007-08   (d) Both (b) and (c)

85. Which of the following statements (is/are) true?

I. Percentage contribution of the corporate I-Tax (Actual) collections to the total I-Tax (Actual) collections has decreased in the year 2008-09 in comparison to the year 2005-06.

II. Simple Annual growth rate of Actual I-Tax paid by the individual taxpayers for the period 2004-05 to 2008-09 is more than 90 percent

III. Efficacy ratio for the "Corporate I-Tax" collections is the highest in the year 2008-09.

(a) I   (b) II
(c) III   (d) I, II and III

2014

Directions for questions 86 to 88 : Answer the questions on the basis of the information given below.

There are ten real numbers A, B, C, D, E, F, G, H, I. Differences between any two of them are given in the diagram below.
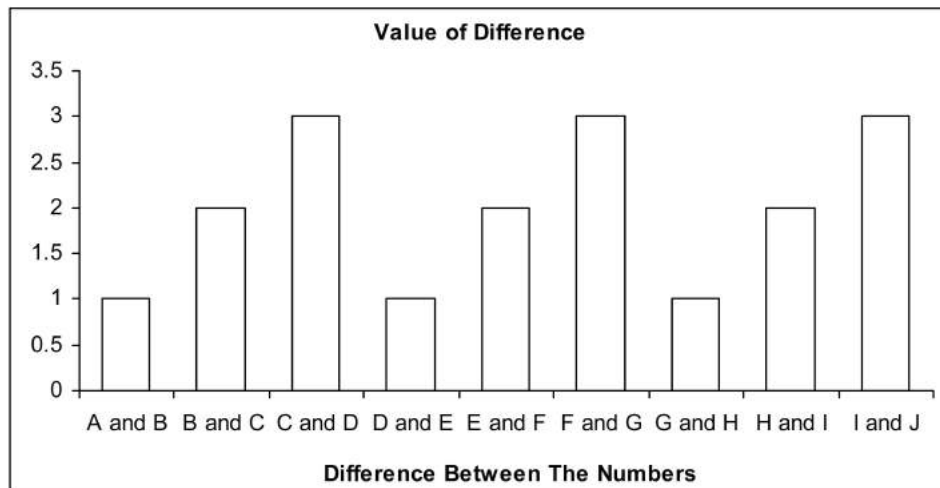
86. If the value of A is known then how many distinct values are possible for J?

(a) 512   (b) 256

(c) 128   (d) None of these

87. If all the 10 numbers from A to J are positive integers then at least how many of them are even?

(a) 3   (b) 4

(c) 5   (d) 6

88. If all the 10 numbers from A to J are positive integers and A is equal to 1 then at a time at most how many of them can be perfect squares?

(a) 7

(b) 9

(c) 8

(d) 6

2014

Direction for questions 89 to 92 : Answer the questions on the basis of the information given below.

The graphs given below show the revenues and profits of four IT education companies.

Profitability = (Profit/Revenue)

Total cost = Revenue – Profit

Revenues
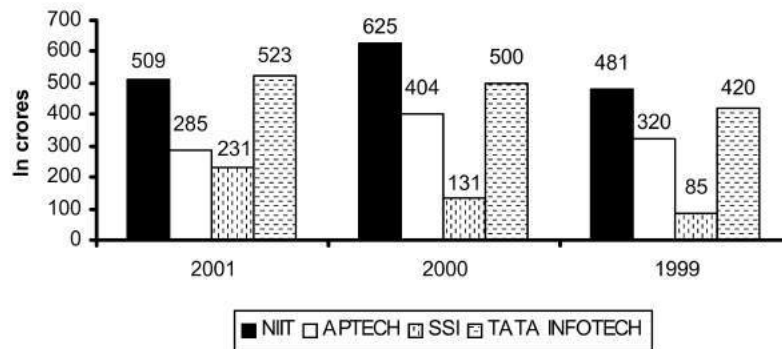
Profits
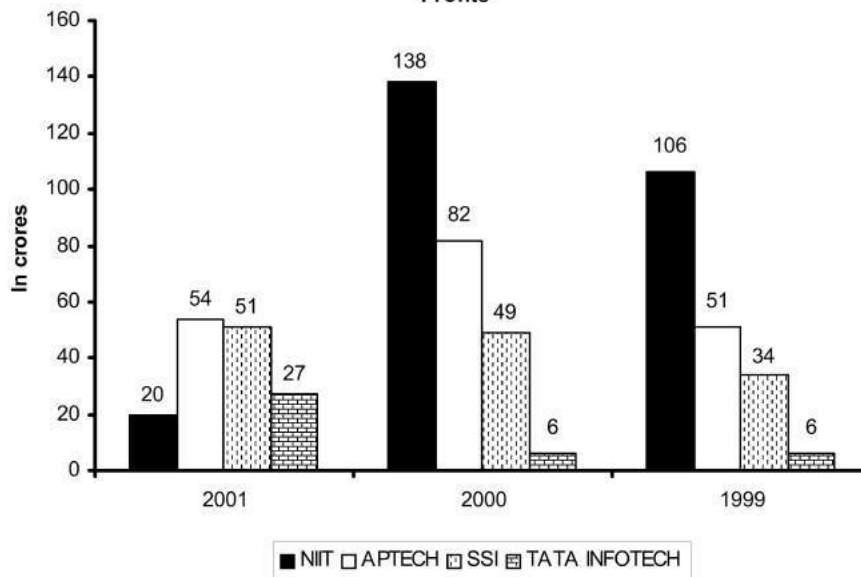
89. In 1999, how many companies have a profitability less than the average of the profitabilities of the four companies?

(a) 1

(b) 2

(c) 3

(d) 0

90. In 2002, if the cost in each company increased by 10% over 2001 and the revenue for each company decreased by 10% over 2001, what is the approximate profitability of all the companies taken together in 2002?

(a) 10.25%

(b) −10.25%

(c) −9.25%

(d) 8.75%

91. Arrange the companies in increasing order of their profitability in 2001.

(a) NIIT, Tata Infotech, Aptech, SSI

(b) NIIT, Tata Infotech, SSI, Aptech

(c) NIIT, Aptech, Tata Infotech, SSI

(d) SSI, Aptech, Tata Infotech, NIIT

92. Which company has the highest profitability in 2000?

(a) NIIT

(b) Aptech

(c) SSI

(d) Tata Infotech

LEVEL - 3

1990

Directions for Questions 93 to 96: *Answer the questions on the basis of the information given below.*

The following graph shows the value of liquor supplied by the 5 states in 1996 and the excise duty rates in each state.
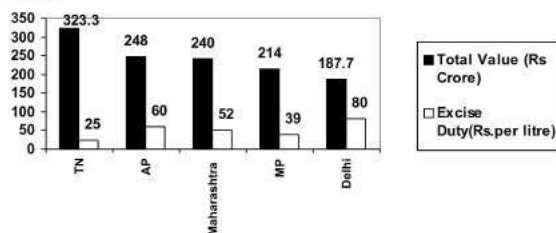
Amount of liquor supplied in Tamil Nadu Distilleries A, B, C, D, E (from bottom to top) in lakh litres.
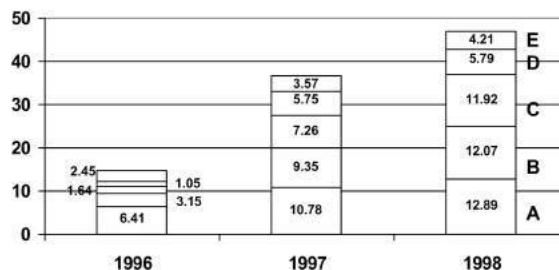
93. What is the lowest percentage difference in the excise duty rates for any two states?

(a) 12

(b) 15

(c) 20

(d) Cannot be determined.

94. Which of the five states manufactured liquor at the lowest cost?

(a) Tamil Nadu

(b) Delhi

(c) The states which has the lowest value for (wholesale price-Excise duty) per litre

(d) Cannot be determined.

95. If Excise duty is levied before the goods leave the factory (on the value of the liquor), then which of the following choices shows distilleries in ascending order of the excise duty paid by them for the year 1996? (Assume the total liquor in TN is supplied by only these 5 distilleries).

(a) ECABD

(b) ADEBC

(c) DCEBA

(d) Cannot be determined.

96. If the Tamil Nadu distillery, with the least average simple annual growth in amount of liquor supplied in the given period had shown the same rate of growth as the one which grew fastest, what would that company's supply have been in 1998, in lakh liters?

(a) 13

(b) 15.11

(c) 130

(d) Cannot be determined.

1. (a)	**2.** (a)	**3.** (b)	**4.** (b)	**5.** (c)	**6.** (c)	**7.** (d)	**8.** (d)	**9.** (c)	**10.** (d)
11. (c)	**12.** (b)	**13.** (d)	**14.** (c)	**15.** (d)	**16.** (a)	**17.** (c)	**18.** (a)	**19.** (b)	**20.** (d)
21. (c)	**22.** (b)	**23.** (a)	**24.** (d)	**25.** (d)	**26.** (b)	**27.** (b)	**28.** (c)	**29.** (a)	**30.** (c)
31. (b)	**32.** (b)	**33.** (a)	**34.** (c)	**35.** (c)	**36.** (a)	**37.** (b)	**38.** (a)	**39.** (b)	**40.** (a)
41. (d)	**42.** (b)	**43.** (b)	**44.** (d)	**45.** (c)	**46.** (a)	**47.** (c)	**48.** (b)	**49.** (a)	**50.** (a)
51. (c)	**52.** (b)	**53.** (b)	**54.** (d)	**55.** (a)	**56.** (d)	**57.** (b)	**58.** (c)	**59.** (a)	**60.** (b)
61. (a)	**62.** (d)	**63.** (d)	**64.** (c)	**65.** (c)	**66.** (d)	**67.** (a)	**68.** (b)	**69.** (a)	**70.** (b)
71. (b)	**72.** (b)	**73.** (d)	**74.** (a)	**75.** (c)	**76.** (d)	**77.** (c)	**78.** (c)	**79.** (a)	**80.** (a)
81. (d)	**82.** (c)	**83.** (c)	**84.** (a)	**85.** (d)	**86.** (d)	**87.** (b)	**88.** (a)	**89.** (b)	**90.** (b)
91. (a)	**92.** (c)	**93.** (d)	**94.** (d)	**95.** (c)	**96.** (b)				

SOLUTIONS

LEVEL - 1

1. a Required average

$$= \frac{(100.5 + 67 + 141 + 143.9 + 65)}{5} = 103.48$$

2. a The key here is figuring out that the only performance which is less than the 1985 performance is the 1988 performance. Hence the percentage corresponding to 1988 should be less than 100.

Thus we see that (c) cannot be the answer. Also (b) cannot be the answer as it shows two of the years having less than 100%.

Between options (a) and (d), the correct answer is (a), This is so because the difference between the 1985 and 1988 performance is only 2 units on 67 units. Hence percentage wise it has to be 97% and not 68%.

3. b The highest percentage decline over the previous year is seen for the year 1988, as in this year the performance almost halved.

For questions 4 to 7:

The given graph can be represented in the following manner:

Years	Net Fixed Assets (NFA)	Net Current Assets (NCA)	Investments	Total Assets (TA)
1990	7	13	2	22
1991	8	16	1	25
1992	7.5	15	2	25
1993	9	17	4	30

4. b The growth rate of total assets between

$$1990\text{-}93 = \frac{(30 - 22)}{22} = 36\%.$$ But this is for a 3 year period.

Hence, simple average annual growth rate

$$= \frac{36}{3} = 12\%.$$

5. c It can be seen that the growth rate is lowest for investments in 1990-91 viz. 50% decrease.

6. c Between 1991 and 1992, the highest growth rate was seen for investments viz. 100% increase.

7. d It can be seen that every individual item has shown a decrease in some year or the other. Only Total Assets has not followed this trend.

For questions 8 to 11:

The data given the graph can be tabulated as given below :

College	1988-89	1989-90	1990-91
Private Engg. College	120	180	250
Govt. Engg. College	80	130	130
Regional Engg. College	40	70	100
IIT	30	40	80

8. d Total number of students in 1989–90

$$= (180 + 130 + 70 + 40) \times 100 = 42000.$$

9. c Growth rate in number of students in Govt. Engg.

College $= \frac{(120 - 80)}{80} = 50\%$

Growth rate in number of students in Private Engg.

College $= \frac{(180 - 120)}{120} = 50\%.$ Hence the growth rate is equal.

10. d Total number of students in 1990–91

$$= (250 + 130 + 100 + 80)\,100 = 56000$$

Hence the total number of students in 1991-92

$$= 0.9 \times 56000 = 50400.$$

Hence (d) is the correct answer

11. c Percentage of IIT students in 1990 – 91

$$= \frac{80}{560} = \frac{1}{7} = 14.28\%$$

For questions 12 to 16:

The graph given in the question can be expressed as a table given below.

Year	Import	Export	Trade Deficit
1987-88	17	11	6
1988-89	19	12	7
1989-90	21	16	5
1990-91	24	18	6
1991-92	20	18	2
1992-93	22	18	4
1993-94	23	21	2
1994-95	27	24	3
	173	138	

12. b Trade deficit = Imports – Exports, was the highest for the year 1988-89, viz. 7 billion dollars.

13. d Trade deficit is less than that in the succeeding year in 1987-88, 1989-90, 1991-92 and 1993-94.

14. c Required percentage = $\dfrac{18}{20} \times 100$ = 90%

15. d In the last three years,

Imports = (22 + 23 + 27) = 72

and   Exports = (18 + 21 + 24) = 63.

Hence, the required percentage = $\dfrac{63}{72} \times 100$ = 87.5% = 88% (approximately).

16. a The first statement is obviously true as the trade deficit in each year is less than the export earning. The export earning has remained constant for three years between 1990 and 1993. Hence, statement II is not true. Even statement III is not true as the exports in 1994-95 is more than the imports in 1993-94.

For questions 17 to 21:

The graph given in the question can be depicted in the following table:

	1989	1990	1991	1992
Journals	46	47	45	44
Magazines	31	39	45	50
Books	73	77	79	79
Total	150	163	169	173

17. c The highest change in the revenue obtained from journals is (47 – 45) = 2 in 1991.

18. a In 1992, percentage of total revenue that came from books = $\dfrac{79}{173} \times 100$ = 45.6% = 45% (approximately).

19. b In 1990, there was an increase in revenue for all the 3 categories. In 1991, it increased for magazines and books.

And in 1992, it increased only for magazines. So the answer is b, viz. 2 years.

20. d Growth rate in 1992 over 1991 = $\dfrac{(173 - 169)}{169}$

= 2.36%. If this rate remained same in 1993 as well, then the revenue in 1993 would be $173 \times \left(1 + \dfrac{2.36}{100}\right)$ = Rs. 177 lakh.

21. c Percentage growth in the total revenue from 1989 to 1992

$= \dfrac{(173 - 150)}{150}$ = 15.33% = 15% (approximately).

For questions 22 to 26:

To handle this type of questions, the best way is to express the data in tabular form.

Year	1989	1990	1991	1992	1993	1994	1995
Revenue	120	130	145	165	185	200	220
Expenditure	102	110	115	125	135	140	150
Profit	20	25	30	40	50	60	70

22. b The average revenue collected in the given 7 years

$= \dfrac{(120 + 130 + 145 + 165 + 185 + 200 + 220)}{7}$

= 166.42

which is approximately is Rs. 168 lakh.

23. a Expenses of 7 years add up to 877. Revenue of 7 years add up to 1165.

Hence, the required answer is $\dfrac{877}{1165} \approx \dfrac{880}{1170} \approx 75\%$.

24. d We need to find the profit in each year.

Year	Profit percentage
1990	(5/20) × 100 = 25%
1991	(5/25) × 100 = 20%
1992	(10/30) × 100 = 33.33%
1993	(10/40) × 100 = 25%
1994	(10/50) × 100 = 20%
1995	(10/60) × 100 = 16.66%

From the above table, clearly, the answer is 1992, as in 1992 the profit is maximum, i.e. 33.33%.

25. d The growth in expenditure over the previous year can be expressed as:

Year	Growth in expenditure
1990	(8/202) × 100 = 7.8%
1991	(5/110) × 100 = 4.5%
1992	(10/115) × 100 = 8.7%
1993	(10/125) × 100 = 8%
1994	(5/135) × 100 = 3.7%
1995	(10/140) × 100 = 7.14%

Hence, it is maximum for 1992.

26. b Profit in 1994 = 60. Profit in 1995 = 70. Growth percentage in profit in 1995 over 1994

$$= \left(\frac{10}{60}\right) \times 100 = 16.66\%.$$

Profit in 1996 will be (16.66% of 70) + 70

= Rs. 82 lakh.

For questions 27 to 32:

The values in the graph can be represented in the table given below.

Here O.H. is overheads and Int. is interest, P/C is profit/cost.

Year	Raw Mat.	Wages	O.H.	Int.	Profit
1991	60	45	10	50	15
1992	50	55	20	55	25
1993	65	60	15	55	20
1994	75	65	25	50	-30
1995	80	65	20	50	15
Total	330	290	90	260	45

27. b We can see that the increase in raw material has been maximum in 1993, viz. 15 points increase.

28. c The change in the profit is maximum in 1993-94. In this year, there is a 50 points drop in the profits.

29. a It can be seen that the interest has remained more or less constant over the given period.

30. c

Year	Raw Mat.(RM)	O.H.	OH/RM x 100
1991	60	10	16.66%
1992	50	20	40%
1993	65	15	23.07%
1994	75	25	33.33%
1995	80	20	25%

Thus, it can be seen from the above table that the overheads as a percentage of raw material is maximum for 1992.

31. b The total profits over the period

$$= (15 + 25 + 20 - 30 + 15) = 45$$

Total costs = (330 + 290 + 90 + 260) = 970

Hence, profit/costs $= \dfrac{45}{970} = 4.6\% = 5\%$ (Approximately)

32. b If the interest component is not included in the cost, the data can be represented as follows.

Year	Cost	Profits	P/C x 100
1991	115	15	13.04%
1992	125	25	20%
1993	140	20	14.28%
1994	165	-30	-
1995	165	15	9.09%

Hence, we can see from the table that maximum profit per unit cost is in 1992.

33. a Man-hours spent in coding is 420 + 100 = 520.

Now going by options, we see (a) is the only option.

34. c Total work is approximately

(100 + 80) + (420 + 100) + (280 + 140) = 1120

On-site work = 80 + 100 + 140 = 320

Percentage of total work carried out on-site is

$\dfrac{320}{1120} \times 100 = 30\%$ approximately.

35. c From figure the total effort in man-hours spent on-site is 320.

It is nearest to actual man-hours of offshore testing which is 280 (approximately.)

36. a Total man-hours

= (100 + 80) + (420 + 100) + (280 + 140) = 1120.

Total working hours = 100

Total man working = $\frac{1120}{100}$ = 11.2 or 11.

For 50 hr the total man-hours is 50 × 11 = 550, which is near to coding (420 + 100)

Hence, (a) is the correct option.

37. b Initial offshore testing man-hours = 280.

Initial onshore testing man-hours = 140.

Final offshore testing man-hours

= 280 − 50% of 280 = 140

Final onshore testing man-hours = 140 + 140 = 280.

Hence, the proportion of testing offshore

$$= \frac{140}{(140+280)} = 30\% \text{ approximately.}$$

38. a

	Design	Coding	Testing
Initially	80	100	140
Finally	$80 + \frac{100}{2} = 130$	$100 + \frac{420}{2} = 310$	

$140 + \frac{294}{2} = 287$

39. b On interchanging the effort allocation between operations B and C, then C and D, and then D and E we find that B takes the E's position.

Looking at the effort in B and then ranking in ascending order we find that the company 3 ranks third.

40. a Total effort for operation B through F is 81.5%.

Even distribution will give effort allocation in each operation = $\frac{81.5}{5}$ = 16.3%

∴ Change in E = 28.6 − 16.3 = 12.3%

41. d Since we are given about company 1, 4, 5 in options so we will look for changes in these companies only.

Allocation of effort in B, C, D in companies 1 = 43.1

Remaining operations gets $\frac{43.1}{3}$ = 14.4% each.

Allocation of effort in B, C, D operations of company 4 = 29.7

Remaining operation is allocated extra $\frac{29.7}{3}$ = 9.9% each.

Allocation of effort in B, C, D operation of company 5 = 36.8

Remaining operation is allocated $\frac{36.8}{3}$ = 12.3% each.

We see that operation E in company 5 will then show the maximum.

For questions 42 to 47:

Position of States (Rank)	Year				
	96-97	97-98	98-99	99-00	00-01
1	MA	MA	MA	MA	MA
2	TN	TN	TN	TN	TN
3	GU	AP	AP	AP	AP
4	AP	GU	GU	GU	UP
5	KA	UP	UP	UP	GU
6	UP	KA	KA	KA	KA
7	WB	WB	WB	WB	WB

(Rank 4 and 5 for 00-01: } changed twice)

42. b From above table, we can conclude that option (b) is correct.

43. b On referring to the table, we can see that UP is the state which changed its relative ranking most number of times.

44. d We can say directly on observing the graph that the sales tax revenue collections for AP has more than doubled from 1997 to 2001.

45. c Growth rate of tax revenue can be calculated as:

(Sales tax revenue of correct year − Sales tax revenue of previous year)

For year 1997-98 $\frac{7826 - 7290}{7826}$ = 0.068

For year 1998-99 $\frac{8067 - 7826}{7826}$ = 0.030

For year 1999-2000 $\frac{10284 - 8067}{8067}$ = 0.274

For year 2000-01 $\frac{12034 - 10284}{10284}$ = 0.170

46. a For increase by the same amount for 2 successive years, eliminate the options by subtracting only the last digit.

For Karnataka, increase in 2000-01 is 5413 − 4839 = 574 and increase in 1999-2000 is 4839 − 4265 = 574.

Hence, (a) is the correct option.

47. c On referring to the table, we can see that Tamil Nadu has been maintaining a constant rank over the years in terms of its contribution to total tax collections.

48. b Here you need to compare the ratio as which is the highest out of $\frac{189}{561}, \frac{209}{587}$ and rest of the options have equal value.

Now we can see that $\frac{209}{587}$ is greater than $\frac{189}{561}$, so 1997 has the highest ratio.

49. a Population in 1995

$$= \frac{421 - 207}{487} \times 1000 \text{ million} \approx 440 \text{ million}$$

Population in 1996

$$= \frac{561 - 189}{464} \times 1000 \text{ million} \approx 802 \text{ million}$$

Population in 1997

$$= \frac{587 - 209}{510} \times 1000 \text{ million} \approx 740 \text{ million}$$

Population in 1999

$$= \frac{660 - 220}{566} \times 1000 \text{ million} \approx 777 \text{ million}$$

Hence, Chaidesh had the lowest population in 1995.

50. a From 96 to 99, in each year the production has increased but the area has decreased. Therefore, the production in unit per area is highest in 1999.

51. c March rainfall is lower than September rainfall in every location.

52. b Peak rainfall occurs in April only in locations 6 and 7.

53. b Both Oil Trade Balance and Total Trade Balance decreased from 1990-91 to 2000-01. The increase in Oil Imports from 1990-91 to 2000-01 was more as compared to the increase in Oil Exports from 2000-01 to 2010-11.

54. d Non-Oil Exports increased by approximately 273% from 2000-01 to 2010-11.

Total Exports increased by approximately 377% from 1990-91 to 2000-01.

Oil Imports increased by 175% from 1980-81 to 1990-91.

Total Imports increased by approximately 55% from 2000-01 to 2010-11.

55. a Absolute percentage change in the total sales of Naruti Kuzuki Ltd. from April to July

$$= \frac{5670 - 5250}{5250} \times 100 = 8\%$$

Absolute percentage change in sales of Dwift from April to July $= \frac{75 - 69}{75} \times 100 = 8\%$

56. d Sales of the other car models of Naruti Kuzuki Ltd. in May 2010

$= 549000 - (50 + 72 + 51 + 52) \times 1000 = 324 \times 10^3$

Sales of the other car models of Naruti Kuzuki Ltd. in July 2010

$= 567000 - (42 + 63 + 33 + 69) \times 1000 = 360 \times 10^3$

Percentage increase

$$= \frac{360 - 324}{324} \times 100 = 11.11\%$$

57. b The ratio of the sales of Sezire to the total sales of cars by Naruti Kuzuki Ltd. in:

$$\text{April} = \frac{49 \times 1000}{5250 \times 100} = \frac{7}{75}$$

$$\text{May} = \frac{72 \times 1000}{5490 \times 100} = \frac{8}{61}$$

$$\text{June} = \frac{72 \times 1000}{5580 \times 100} = \frac{8}{62}$$

$$\text{July} = \frac{63 \times 1000}{5670 \times 100} = \frac{1}{9}$$

So the ratio is the highest for May.

For questions 58 to 60 : The given data can be tabulated as shown below.

Counties	NCD deaths in 2008			NCD deaths in 2009		
	Male	Female	Total	Male	Female	Total
Indonesia	582	815	**1397**	275	850	**1125**
Russia	827	892	**1719**	950	925	**1875**
India	2967	2273	**5240**	3160	2020	**5180**
China	4323	3670	**7993**	4195	3850	**8045**
USA	1054	1150	**2204**	1150	530	**1680**
Total	**9753**	**8800**	**18553**	**9730**	**8175**	**17905**

58. c In three countries, viz. Indonesia, India and USA, the number of deaths due to NCDs in 2009 was less than that in 2008.

59. a Required percentage $= \frac{8800 - 8175}{8800} \times 100 = 7.10.$

60. b Required difference $= (9753 - 9730) \times 1000 = 23000.$

LEVEL - 2

61. a Percentage change in FEI in 1998 relative to 1997 for various countries is:

For India $= \frac{(0.72 - 1.71)}{1.71} = \text{-}57.89 \%$

For China $= \frac{(4.8 - 5.96)}{4.8} = -19.46\%$

For Malaysia $= \frac{(9.92 - 10.67)}{10.67} = -7.02\%$

For Thailand $= \frac{(5.282 - 5.09)}{5.2} = 14.34\%$

Hence, highest change (absolute) is for India.

62. d Since the absolute values are not given, it cannot be calculated.

63. d Assume GDP of India for 1997 to be x.

For 1998, India's FEI $= \frac{0.72 \times 102x}{100} = 0.7344x$

And foreign equity inflows for 1997 = 1.71x

For China, assume GDP as y. Then, FEI in 1998

$= \frac{107y}{100} \times 4.8 = 5.136y.$ And FEI in 1997 = 5.96y.

For South Korea, let GDP be z.

FEI in 1998 = $\frac{95z}{100}$ × 2.5 = 2.375z and FEI in 1997 = 2.16z.

FEI of India and China were lower in 1998 than in 1997, while that of South Korea was higher in 1998 than in 1997.

64. c Let x be the foreign equity inflow of India. Thus, China's foreign equity inflow is 10x.

Now in 1998, FEI in India was 0.72. Therefore,

$$0.72 = \frac{x}{\text{GDP of India}}$$

Similarly, FEI in China in 1998 was 4.8, therefore, $4.8 = \frac{10x}{\text{GDP of China}}$

Hence, (GDP of China/GDP of India) = (10 × 0.72)/4.8 = 1.5. Thus, China's GDP is 50% higher than that of India.

65. c It is clear from the given graph.

66. d Let us first find out the growth in 1990 of the all four sectors. So manufacturing 9% of 20 = 1.8. Hence, 20 + 1.8

= 21.8. Similarly, for mining and quarrying it is 15.6. For electrical, it is 10.85 and for chemical it is 16.1. Now in 1991 there is 1% negative growth in manufacturing. So 1% of 21.8 becomes 0.218. Thus, 21.8 − 0.218 = 21.582. Similarly, for mining and quarrying it is 15.44. For electrical it is 11.88 and for chemical it is 16.21.

Now we add the figures for 1991 of all the sectors which comes to 21.582 + 15.75 + 11.88 + 16.21 = 65.42. Now, 65.42 − 64.35 = 1.07, which comes to approximately 1.5% growth rate.

67. a It is clear from the graph that manufacturing is always growing in 1992 − 98. Hence, it will reach highest level in 1998.

68. b In 1990, there is 4% growth.

Hence, 4% of 15 = 0.6. So weightage in 1990 becomes 15.6.
Similarly, in 1991 it becomes 15.44, in 1992 it is 15.6, in 1993 it is 14.97, in 1994 it is 16.16.
Hence, it can be seen that the lowest level of production was in 1993.

69. a Find out the weightage for all the sectors for 1994. For manufacturing it is 25.54, for mining and quarrying it is 16, for electrical it comes out to be 14.5 and for chemical it is 19.5. The total comes to approximately 77. In 1989, it was 60. Hence, 77 − 60 = 17 which is approximately 25% increase.

70. b Since the index of total industrial production in 1994 is 50% more than in 1989, it becomes 150.

Now, total weightage for manufacturing, mining and quarrying, electrical and chemical in 1994 is approximately 77. So 150 − 77 = 73.

In 1989, it was 100 − 60 = 40.

So 73 − 40 = 33, which is approximately 87.5%.

71. b Number of Naya mixer-grinders disposed off in 1999 = 20% of 30 = 6

So the number of Naya mixer-grinders in 1999, i.e. 124 is inclusive of those mixer grinders produced in 1997 and 1998 and still in operation. The numbers are (30 − 6) = 24 and (80 − 30) = 50 respectively.

Therefore, number of new Naya mixer-grinders purchased in 1999 = 124 − (50 + 24) = 50.

72. b Number of Naya mixer-grinders disposed off in 1999 = 20% of 30 = 6

Number of Naya mixer-grinders disposed off in 2000 = 20% of (80 − 30) = 10

Therefore, total number of Naya mixer-grinders disposed by end of 2000 = 6 + 10 = 16.

73. d Sine information regarding the number of Purana mixer-grinders for the years prior to 1995 is not known, it cannot be ascertained as to how many of them were disposed off in 2000.

74. a It is given that 10 Purana mixer-grinders were disposed off as junk in 1997. So the number of mixer-grinders in operation in 1997 must have been 162 − 10 = 152. But it is given to be 182.

∴ Number of newly purchased Purana mixer-grinder in 1997 = 182 − 152 = 30

20% of this, i.e. 6 were disposed off in 1999. So the number of mixer-grinders in operation in 1999 must have been 222 − 6 = 216. But it is given to be 236.

∴ Number of newly purchased Purana mixer-grinder in 1999 = 236 − 216 = 20.

For questions 75 to 78:

In any department in any given year, the average year ranges between 42-53 years.

(i) When a 25 year old will join, the average age will dip by a minimum of 5 years.

(ii) When a 60 year old will retire, the dip will be less compared to (i).

75. c In the bar graph, one dip corresponds to the new 25 year old joinee. However, two dips in the trend implies joining of a 25 year old and the retirement of a 60 year old employee. This trait is observed only in Finance department. Hence, the faculty member who retired belonged to Finance.

76. d From the graph of Marketing, it is clear that the new faculty joined in 2001.

On April 1, 2000, completed age of Professor Naresh and Devesh were 52 years and 49 years, in no particular order.

∴ Age of the third Professor on April 1, 2000
= 49.33 × 3 − (52 + 49) = 47 years

Hence, his age on April 1, 2005 will be 52 years.

77. c As the dip will be less in case a faculty retired compared to that when a new faculty joined in, so the new faculty member joined the Finance area in 2002.

78. c For the OM area, the only dip comes in the year 2001. So the new 25 year old faculty joined in 2001. Hence, on April 1, 2003, his age will be 27 years old.

79. a Subscription in Europe in 2006 = 380 Mn USD

Subscription in Europe in 2007 = 500 Mn USD

% change in 2007 $= \dfrac{500 - 380}{380} \times 100 \approx 30\%$

Therefore subscription (based upon the growth rate of 2007 over 2006) in 2008 should have been

$= 500 \times 1.3 = 650$ Mn USD (approx)

Therefore difference from the estimated subscription

$= 650 - 600 = 50$ Mn USD (approx)

[Please note that the unit is mentioned neither in the question, nor in the options]

80. a Let the total number of subscribers = 100x

Number of men = 60x

Therefore number of men in 2010

$= 60x \times (1.05)^7 = 84.42x$ (approx)

Number of women = 40x

Therefore, number of women in 2010

$= 40x \times 1.1^7 = 77.94x$ (approx)

Therefore, total number of subscribers

$= 84.42x + 77.94x = 162.36x$

Percentage growth of subscribers

$= \dfrac{162.36x - 100x}{100x} = 62.36$ (approx)

81. d Gap in 2008 = 780 − 600 = 180 Mn USD

Gap in 2009 = 810 − 700 = 110 Mn USD

Annual % change $= \dfrac{110 - 180}{180} \times 100 = -39\%$

Absolute change = 39% which is the highest.

Among the other options, option (c) '06-07' is closest, but it will lead to only 22% change in gap.

82. c Growth rate of 2007 $= \dfrac{500 - 380}{380} \times 100 = 31.58\%$

Growth rate of 2005 $= \dfrac{280 - 190}{190} \times 100 = 47.37\%$

Therefore % change in growth rate of 2007 relative to growth rate of 2005 is

$\dfrac{47.37 - 31.58}{47.37} \times 100 \approx 35\%$

83. c For the year 2005-06 and 2008-09

	Efficacy Ratio		
	Total	Corporate	Individual
2004-05	0.96	0.98	0.89
2005-06	**1.03**	**0.98**	**1.5**
2006-07	0.98	1.01	0.79
2007-08	0.96	0.99	0.86
2008-09	**1.02**	**1.12**	**0.79**

Alternate method:

2004 - 05: By visual inspection for both "Total I-Tax" and "Corporate I-Tax" efficacy ratio is less than one, hence we need not check for "Individual I-Tax".

2005 - 06: Similarly, efficacy ratio of "Total I-Tax" collections is more than one but for "Corporate I-Tax" it is less than one, calculating for "Individual I-Tax" it comes out to be more than one.

2006 - 07: Similarly efficacy ratio of "Corporate I-Tax" is more than one but that of "Total I-Tax" collection is less than one. The same value for "Individual I-Tax" comes out to be less than one.

2007 - 08: By visual inspection for both "Total I-Tax" and "Corporate I-Tax" efficacy ratio is less than one, hence we need not check for "Individual I-Tax".

2008 - 09: Similarly by visual inspection for both "Total I-Tax" and "Corporate I-Tax", efficacy ratio is greater then one.

84. a For the year 2005-06 in the **Corporate I-Tax**

	Total (Budgeted)	% Growth	Total (Actual)	% Growth
2004-05	275	-	285	-
2005-06	345	25.5	335	17.5
2006-07	395	14.5	405	20.9
2007-08	520	31.6	540	33.3
2008-09	730	40.4	715	32.4

	Corporate (Budgeted)	% Growth	Corporate (Actual)	% Growth
2004-05	235	-	240	-
2005-06	**300**	**27.7**	**307**	**27.9**
2006-07	340	13.3	335	9.1
2007-08	425	25	430	28.4
2008-09	560	31.8	500	16.3

85. d I. Percentage contribution of Corporate I-Tax to the Total I-Tax in the year 2005-06

$= \left(\dfrac{307}{335} \right) \times 100 = 91.6\%$

In the year 2008-09 $= \left(\dfrac{500}{715} \right) \times 100 = 70\%$

II. Simple Annual Growth Rate

$= \dfrac{(215 - 45)}{45} \times 100 \times \left(\dfrac{1}{4} \right) = 94.4\%$

III. This is also true as evident from the table provided.

For questions 86 to 88 :

The table below gives all the possible values of B, C, D, E, F, G, H, I and J if the value of A is assumed to be 'x'.

A	x
B	$x \pm 1$
C	$x \pm 1; x \pm 3$
D	$x; x \pm 2; x \pm 4; x \pm 6$
E	$x \pm 1; x \pm 3; x \pm 5; x \pm 7$
F	$x \pm 1; x \pm 3; x \pm 5; x \pm 7; x \pm 9$
G	$x; x \pm 2; x \pm 4; x \pm 6; x \pm 8; x \pm 10; x \pm 12$
H	$x \pm 1; x \pm 3; x \pm 5; x \pm 7; x \pm 9; x \pm 11; x \pm 13$
I	$x \pm 1; x \pm 3; x \pm 5; x \pm 7; x \pm 9; x \pm 11; x \pm 13; x \pm 15$
J	$x; x \pm 2; x \pm 4; x \pm 6; x \pm 8; x \pm 10; x \pm 12; x \pm 14; x \pm 16; x \pm 18$

86. d Clearly only 19 distinct values are possible for J if the value of A is known.

Answer option (d) is the correct choice.

87. b If 'x' is even then A, D, G and J are even. If 'x' is odd then B, C, E, F, H and I are even.

Answer option (b) is the correct choice.

88. a If x = 1 then a possibility is that B = 2, C = 4, D = 1, E = 2, F = 4, G = 1, H = 2, I = 4 and J = 1 in which case 7 values are perfect squares. This is the maximum number of perfect squares which can occur at the same time i.e. in a single case.

89. b Profitability of NIIT in 1999 is $\frac{106}{481} = 0.2204$

Profitability of Aptech in 1999 is $\frac{51}{320} = 0.1594$

Profitability of SSI in 1999 is $\frac{34}{85} = 0.4$

Profitability of Tata Infotech in 1999 is $\frac{6}{420} = 0.0143$

Average of the profitabilities of the four companies in 1999

$$= \frac{\frac{106}{481} + \frac{51}{320} + \frac{34}{85} + \frac{6}{420}}{4} = 0.1985.$$

∴ Only Tata Infotech and Aptech have a profitability less than the average of the profitabilities in 1999.

90. b Total revenues of four companies in 2001

= 509 + 285 + 231 + 523

= 1548 crore.

Total profit in 2001 = 20 + 54 + 51 + 27

= 152 crore

So   total cost = (1548 – 152) = 1396 crore

In 2002, total revenue ≈ (1548 – 155) crore

= 1393 crore.

Total cost ≈ (1396 + 140) = 1536 crore

Hence,   net profit = (1393 – 1536)

= –143 crore

∴   Profitability = $\frac{-143}{1393}$ = –10.25%.

91. a The profitability of NIIT, Aptech, SSI and Tata Infotech in 2001 is $\frac{20}{509}, \frac{54}{285}, \frac{51}{231}$ and $\frac{27}{523}$ respectively.

Thus, the correct order is:

NIIT, Tata Infotech, Aptech and SSI.

92. c The profitability SSI is highest in 2000 and it is = $\frac{49}{131}$.

LEVEL - 3

93. d The answer cannot be determined as the data for only five states is given and we don't know the excise duty rates for other states.

94. d We have been given the total value in the graph, but nothing is mentioned about the amount of liquor manufactured by states other than Tamil Nadu.

95. c Since Excise duty is levied on the total value of liquor produced by the 5 distilleries, this will be in the same order as the order of the amount of the liquor produced by them (as the excise duty rate remains constant). Hence the correct order is DCEBA.

96. b Average simple annual growth rate of five distilleries is as follows:

$A = \frac{1}{2}\left(\frac{12.89 - 6.41}{6.41}\right) \times 100 = 50.54\%$

$B = \frac{1}{2}\left(\frac{12.07 - 3.15}{3.15}\right) \times 100 = 141.58\%$

$C = \frac{1}{2}\left(\frac{11.92 - 1.64}{1.64}\right) \times 100 = 313.41\%$

$D = \frac{1}{2}\left(\frac{5.79 - 1.05}{1.05}\right) \times 100 = 225.71\%$

$E = \frac{1}{2}\left(\frac{4.21 - 2.45}{2.45}\right) \times 100 = 35.91\%$

So the distillery with highest growth rate is C and with lowest growth rate is E.

So had the amount of liquor manufactured by E grown by 313.41% in the 2 year period ie. Grown by 616.82% overall, its supply in 1998 would be

$2.45 \times \frac{616.82}{100} = 15.11$ liters.