CHAPTER – 9
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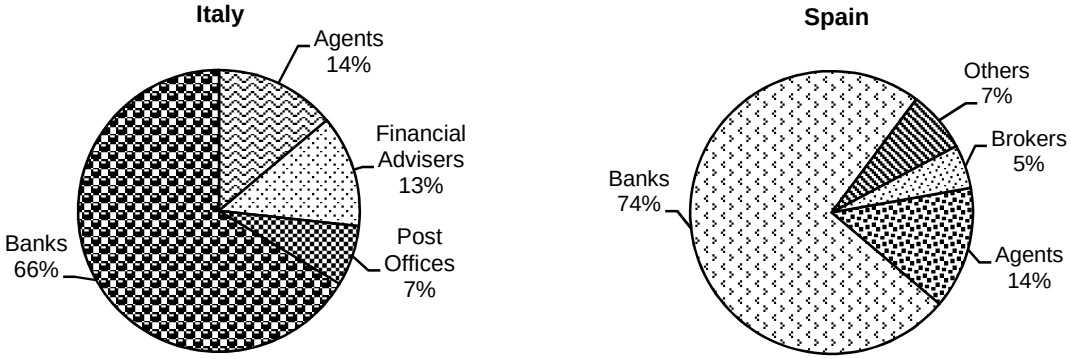
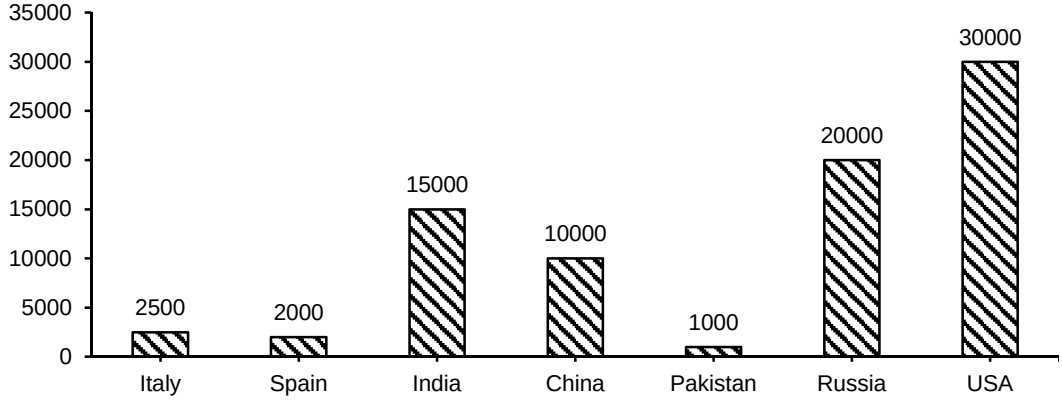
Worked out Examples:

These questions are based on the pie chart and the bar graph given below.

Split-up of sales of Life Insurance by Distribution Channels in 2002



Sale of Life Insurance in various countries in 2002 (in million dollars)



9.01: By what amount is the Life insurance sold in Italy though Agents more/less than the Life Insurance sold in Spain through Brokers and Agents?
(A) Less by \$10 million (B) More by \$30 million
(C) Less by \$30 million (D) More by \$20 million

Sol: Value of Life Insurance sold through Agents in Italy
$= \frac{2500 \times 14}{100} = \$350$ million
Life Insurance sold through Agents and Brokers in Spain in 2002 = 19%
Value of Life Insurance sold through Agents and Brokers in $= \frac{2000 \times 19}{100} = \$380$ million
Spain in 2002.
The value of Insurance sold in Italy is less than that of similar sale in Spain by \$30 million Choice (C)

9.02: The split-up of sales of Life Insurance by distribution channels for India in 2002 is the same as that of Spain. If the Insurance agents in India are paid a commission of 0.5% of their sales, then what is the amount of commission earned by them?
(A) \$9.5 million (B) \$9.75 million
(C) \$10.5 million (D) \$13.25 million

Sol: Value of Insurance sold in India by Agents in 2002
$= \frac{15000 \times 14}{100} = \$2100$ million
Commission paid to agents on the value of Insurance sold $= \frac{2100 \times 0.5}{100} = \$10.5$ million
Choice (C)

9.03: In 2002 if the post offices in Italy earned 1.25% of their total revenue from the sale of Life insurance, then what is total revenue earned by post offices in Italy in 2002 given that the commission earned by post offices in selling Life insurance is 1.5% of the value sold?
(A) \$2.625 million (B) \$21 million
(C) \$2.10 million (D) \$210 million

Sol: Value of Life Insurance sold through post offices in Italy in 2002 $= \frac{2500 \times 7}{100} = \$175$ million

Commission earned by the post offices on this sale $= \frac{175 \times 1.5}{100} = \$2.625$ million

\$2.625 million is 1.25% of the revenue earned by post offices in Italy in 2002.

∴ Total Revenue of post offices in Italy $= \frac{2.625 \times 100}{1.25} \times \$210$ million Choice (D)

9.04: If the value of Life insurance sold in India has consistently increased by 10% every year from the year 1998 to 2002, then what is the value of Life insurance sold in India in 1998 as a percentage of the Life insurance sold by China in 2002?

(A) 92.86% (B) 102.45%
(C) 2.45% (D) 75.68%

Sol: Lets assume that Life insurance sold in India in 1998 = x

∴ Life insurance sold in India in 2002 = x. $(1.1)^4$

∴ x.$(1.1)^4$ = 15000

∴ x = $\frac{15000}{(1.1)^4} = \frac{15000}{1.4641} \approx 10245$ million

∴ Life Insurance sold in India in 1998 as a percentage of that sold in China in 2002 = $\frac{10245}{10000} \times 100 = 102.45\%$ Choice (B)

9.05: If it is known that 12.5% of the total Life insurance sold in the countries is listed for term insurance then what is the approximate value of non-term insurance sold in these countries for the year 2002?

(A) \$10060 million (B) \$64800 million
(C) \$70400 million (D) Data Insufficient

Sol: Total Life insurance sold in all the countries listed in the graph = \$80500 million

Non-term Insurance is 87.5% of this value

$= \frac{80500 \times 7}{8} \approx 70400$ Choice (C)

Exercise – 9(a)

Directions for questions 1 to 5: These questions are based on the table given below which shows the number of tonnes of fish caught through the traditional and modern methods across several years in Andhra Pradesh.

	Fishing in inland waters in different types of water bodies						**Fishing in the seas**	
	Artificial Tanks		**Lakes**		**Rivers**		**The seas**	
	Traditional	**Modern**	**Traditional**	**Modern**	**Traditional**	**Modern**	**Traditional**	**Modern**
1996	25	586	41	169	129	1348	569	5341
1997	47	631	72	201	181	1421	831	5583
1998	57	754	131	296	241	1639	947	6164
1999	61	836	129	354	297	1743	1152	6341
2000	63	929	129	421	324	1869	1181	6861
2001	60	1016	108	494	351	1931	1261	7146
2002	61	1089	121	528	407	2046	1734	7232
Total	374	5841	731	2463	1930	11997	7675	44668

1. During the year 1998, what is the total tonnage of fish caught in the inland waters?
(A) 10229 (B) 6164 (C) 4768 (D) 3118

2. Which of the following can be inferred from the given data for the period 1999 to 2002?
I. The tonnage of fish caught in the inland waters by traditional methods is increasing every year over its value in the previous year.
II. The tonnage of fish caught by the traditional methods is continuously decreasing.
III. The tonnage of fish caught by the modern methods is continuously decreasing.
IV. There is a decrease in the quantity fish caught by traditional methods in two successive years.
(A) I only (B) II only
(C) II and III only (D) I and IV only

3. During the given years, the quantity of fish caught by modern methods is approximately how many times that caught by traditional methods?
(A) 3 (B) 4 (C) 2 (D) 6

4. When compared to the previous year during which of the following years is the growth rate in quantity of fish caught, the least?
(A) 1998 (B) 1999 (C) 2000 (D) 2001

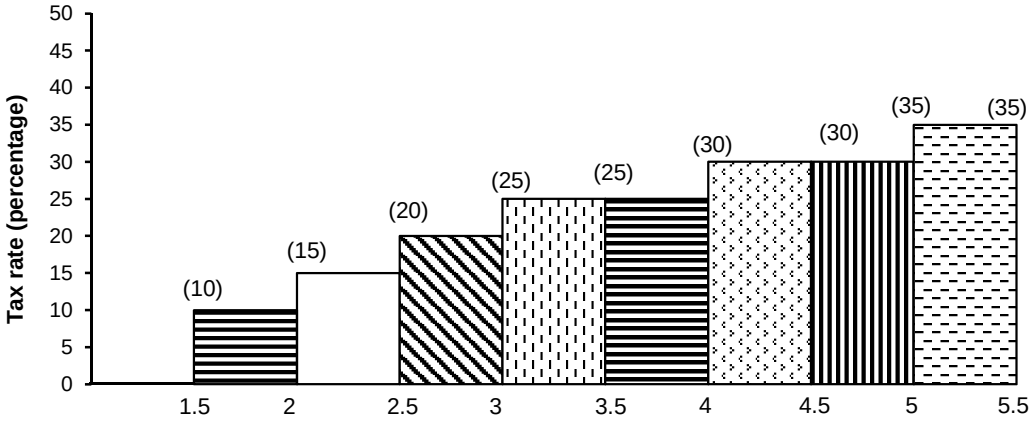
5. The average weight of the fish caught in the artificial tanks, lakes, rivers and the seas is in the ratio 2 : 3 : 4 : 5. The number of fish caught in which of the following water bodies is the least?
(A) Artificial tanks (B) Lakes
(C) Rivers (D) Seas

Directions for questions 6 to 10: These questions are based on the table and the bar graph given below.

Income plan of five persons for the year 2003-04

	Name of the person	Sharma	Rao	Gupta	Solkar	Kuchroo
Rupees in Lakhs	Profession	Doctor	Engineer	Business man	Doctor	Professor
	Annual income	4.50	3.50	3.00	4.00	5.00
	Annual expenditure	3.00	2.50	2.50	2.50	3.50
	Annual savings	1.50	1.00	0.50	1.50	1.50
Rupees in Thousands	**The annual savings are invested as shown below**					
	PPF	50	50	25	50	80
	Life insurance	20	8	7	20	15
	Medical insurance	5	2	3	5	5
	Pension plan	10	17	5	15	10
	Debt funds	35	13	5	40	20
	Monthly income plan (MIP)	30	10	5	20	20

The graph below shows various Income slabs and the corresponding tax rates. For example, an annual income of ₹1.8 lakhs falls in the range ₹1.5 lakhs–₹2.0 lakhs. Hence tax rate applicable is 10%. Similarly for an income of ₹2 lakhs, the tax rate is 15% as it falls in the slab of ₹2 lakhs–₹2.5 lakhs.



Note: Income tax is calculated on the annual income.

Directions for questions 6 to 9: Type in your answer in the input box provided below the question.

6. How many of the given five persons paid an income tax exceeding rupees one lakh for the year 2003-04?

7. If there is an exemption of tax on PPF, what is the total tax payable by the two doctors on their total taxable income?

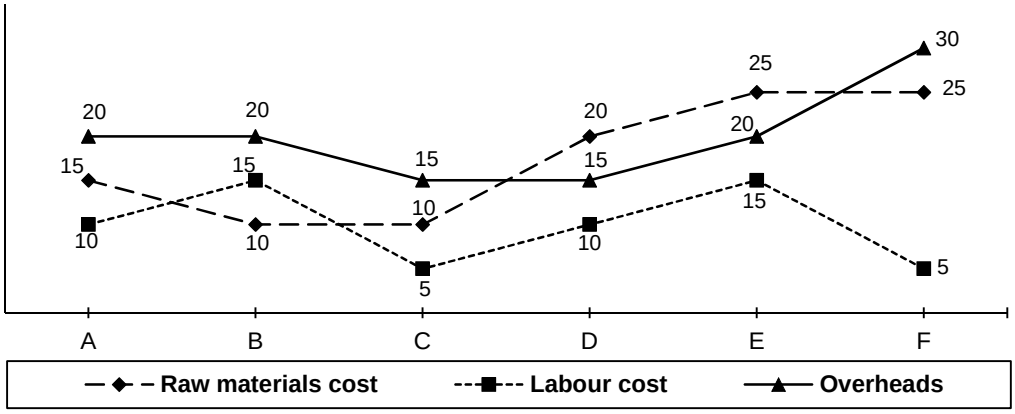
8. How much more should Gupta save so that his savings are 35% of his income?

9. An interest of 8% per annum is payable on the investment in PPF for the given year. Considering all the five persons, what is the average amount of interest payable per person?

10. For which of the given persons, the ratio of the annual savings to that of the annual expenditure is least?
(A) Sharma
(B) Rao
(C) Gupta
(D) None of these

Directions for questions 11 to 15: These questions are based on the following graph.

Six different companies A, B, C, D, E and F manufacture a similar product. The cost of raw materials, labour cost and overheads per unit are given below.



11. Which of the following products has the maximum cost per unit?
(A) A (B) B (C) D (D) F

12. If company B produces 5,000 units and sells them at ₹68, then the profit of the company is
(A) ₹1,65,000 (B) ₹1,40,000
(C) ₹1,15,000 (D) ₹1,55,000

13. Which of the following statements is true?
(A) The labour costs of E and F are same.
(B) The ratio of costs, overheads and labour is same for A, B and E.
(C) The ratio of total cost of A and D is same as the ratio of total cost of E and F.
(D) Both (A) and (B)

14. Company D can produce a maximum of 1,000 units per day and company F can produce upto 800 units per day. If these companies sell their products at ₹60 and ₹80 respectively, then what percentage of D's profit is F's profit in the total maximum production of 10 days?
(A) 15 : 16 (B) 3 : 4
(C) 7 : 8 (D) 9 : 10

15. If the labour cost of B is the same as the labour cost of C, then what is the ratio of the total cost of the two companies?
(A) 1 : 1
(B) 1 : 2
(C) 1 : 3
(D) Cannot be determined

Directions for questions 16 to 20: These questions are based on the following table which represents the number of garments manufactured by four companies A, B, C and D for four segments of people, males (M), females (F), children (C) and sports persons (S) during quarters I, II, III and IV of the year 2003.

(in thousands)

	A				B				C				D				
	M	F	C	S	M	F	C	S	M	F	C	S	M	F	C	S	Total
I	33	60	72	20	18	25	36	12	26	35	41	21	41	71	88	30	629
II	44	76	80	25	23	31	43	15	40	59	71	28	55	78	98	35	801
III	45	75	85	30	30	34	48	18	52	68	81	26	60	80	95	41	868
IV	96	84	95	25	32	35	52	21	62	75	83	30	71	92	99	35	937
Total	168	295	332	100	103	125	179	66	180	237	276	105	227	321	380	141	3235

16. If the companies are arranged based on the number of garments manufactured by them in the year 2003, then which of the following is true?
(A) A > D > B > C (B) D > B > C > A
(C) D > A > C > B (D) A > D > C > B

17. For which of the following quarters is the percentage increase over the previous quarter in the number of garments manufactured by company C, for the female segment, the least?
(A) I (B) II (C) III (D) IV

18. In the year 2003, the overall growth achieved by these companies in the number of garments manufactured is 25% more when compared to the number of garments manufactured in 2002. What was total production of garments by these companies in the year 2002 in thousands?
(A) 2426 (B) 2588
(C) 2634 (D) 2432

19. For the year 2003, what is the ratio of the total number of garments manufactured for male segment to that of the female segment?
(A) 113 : 163 (B) 489 : 206
(C) 231 : 106 (D) 369 : 103

20. For how many companies is there a growth in the number of garments in every quarter and for every segment?
(A) 0 (B) 1 (C) 2 (D) 3

Exercise – 9(b)

Directions for questions 1 to 4: Answer the following questions based on the information given below.

The table gives the distances (in km) between major cities in India.

City	Ahmedabad	Bangalore	Bhubaneshwar	Mumbai	Chandigarh	Cochin	Delhi	Hyderabad	Indore	Jaipur	Kanpur	KolKata	Lucknow	Chennai	Nagpur	Patna	Pune
Ahmedabad	–	1490	1697	552	1157	1845	911	1436	442	648	1168	2068	1247	1821	965	1656	664
Bangalore	1490	–	1538	1013	2296	512	2049	563	1601	2005	1855	1461	1934	331	1078	2071	826
Bhubaneshwar	1697	1538	–	1679	2026	1895	1713	1044	1355	1758	1283	423	1254	1207	830	862	1587
Mumbai	552	1013	1678	–	1645	1368	1404	729	589	1148	1278	2012	1366	1344	849	1856	184
Chandigarh	1157	2296	2026	1645	–	1965	248	1693	1052	507	661	1721	740	2489	1217	1332	1663
Cochin	1845	512	1895	1368	1965	–	2718	1090	1804	2745	2385	2318	2572	687	1608	2601	1181
Delhi	911	2049	1713	1404	248	2718	-	1447	806	263	481	1474	494	2243	971	1086	1417
Hyderabad	1436	563	1044	729	1693	1090	1447	-	999	1404	1253	1467	1332	699	476	1469	545
Indore	442	1601	1355	589	1052	1804	806	999	-	405	689	1620	768	1795	445	1205	623
Jaipur	648	2005	1758	1148	507	2745	263	1404	405	-	517	1530	598	2200	928	1115	1371
Kanpur	1168	1855	1283	1278	661	2385	481	1253	689	517	-	1010	79	2049	777	596	1312
Kolkata	2068	1461	423	2012	1721	2318	1474	1467	1620	1530	1010	-	1089	1160	1163	621	2058
Lucknow	1247	1934	1254	1366	740	2572	499	1332	768	598	79	1689	-	2128	856	566	1391
Chennai	1821	331	1207	1344	2489	687	2243	699	1795	2200	2049	1630	2128	-	1272	2096	1157
Nagpur	965	1078	830	849	1217	1608	971	476	445	928	777	1163	856	1272	-	993	909
Patna	1656	2071	862	1856	1332	2601	1086	1489	1205	1115	595	621	566	2096	993	-	1738
Pune	664	826	1587	184	1663	1181	1417	545	623	1371	1312	2058	1391	1157	909	1738	-

1. Among the given cities, which two cities are the farthest apart?
(A) Bangalore – Chandigarh
(B) Chennai – Chandigarh
(C) Patna – Cochin
(D) None of these

2. The distance between Kanpur and Chandigarh is how much less than that between Mumbai and Nagpur?
(A) 178 km
(B) 188 km
(C) 198 km
(D) 207 km

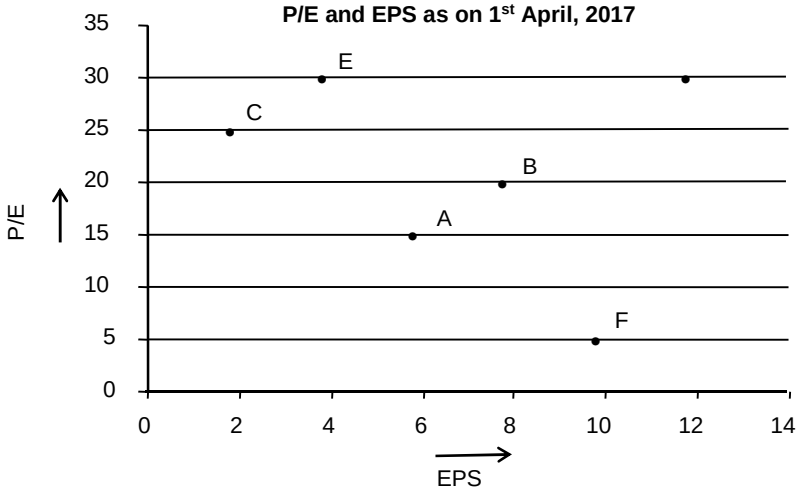
3. Which of the given cities is the farthest from Nagpur?
(A) Bangalore
(B) Chandigarh
(C) Chennai
(D) None of these

4. Starting at Hyderabad, the distance to which city can be reduced if travelled to via Bangalore, rather than going directly to the destination city?
(A) Ahmedabad
(B) Cochin
(C) Kanpur
(D) Chennai

Directions for questions 5 to 9: Answer the following questions based on the information given below.

The following data gives the P/E ratio and EPS of six companies for two consecutive years.

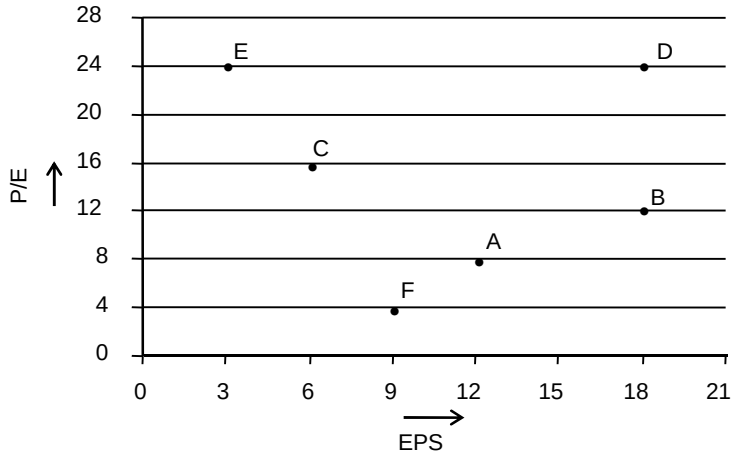
P/E and EPS as on 1st April, 2017



Total number of shares on 1st April, 2017
(in lakh)

A	B	C	D	E	F
12·5	14·8	27·0	8·5	22	7·2

P/E and EPS as on 1st April, 2018



Total number of shares as on 1st April, 2018
(in lakh)

A	B	C	D	E	F
17·5	14·8	40·5	8·5	22·0	7·2

$$\text{P/E ratio} = \frac{\text{Price of the share in rupees}}{\text{Earnings per share in rupees (EPS)}}$$

$$\text{EPS} = \frac{\text{Total Earnings of the Company}}{\text{Total number of shares of the Company}}$$

Directions for questions 5 to 7: Type in your answer in the input box provided below the question.

5. What is the percentage Increase in total earnings of company A from 1st April, 2017 to 1st April, 2018?

6. Which company had the highest increase in total earnings from 1st April, 2017 to 1st April, 2018?

7. What is the price of a share of company B on 1st April, 2018?

Directions for questions 8 and 9: Select the correct alternative from the given choices.

8. In percentage terms, the share price of which company appreciated the most from 1st April, 2017 to 1st April, 2018?
(A) B (B) A (C) C (D) D

9. If the total earnings of company E are same as that of company D as on 1st April, 2019, what will the EPS of company E on 1st April 2019, given the earnings of company D decrease by 10% compared to that on 1st April, 2018 and the number of shares of company E as on 1st April, 2019 is 27.0 lakh?
(A) 7.5 (B) 6.7 (C) 5.8 (D) 5.1

Directions for questions 10 to 12: Answer these questions on the basis of the information given below.

The following table gives the percentage of marks scored by five students – Amar, Ajay, Akbar, Arun and Antony in five subjects – A, B, C, D and E.

	Amar		Ajay		Akbar		Arun		Antony	
	Subject	Marks (%)	Subject	Marks (%)	Subject	Marks (%)	Subject	Marks (%)	Subject	Marks (%)
I	E	90	E	98	C	72	D	78	A	88
II	B	80	B	96	A	66	C	70	B	86
III	A	68	D	60	B	64	B	66	E	78
IV	D	62	C	54	E	62	E	60	D	76
V	C	46	A	48	D	40	A	44	C	42

For each of the students mentioned above, the subjects are arranged in the descending order of the percentages of marks secured by them in those subjects.

Assume that only these five subjects are taught and that there are only five students in the class.

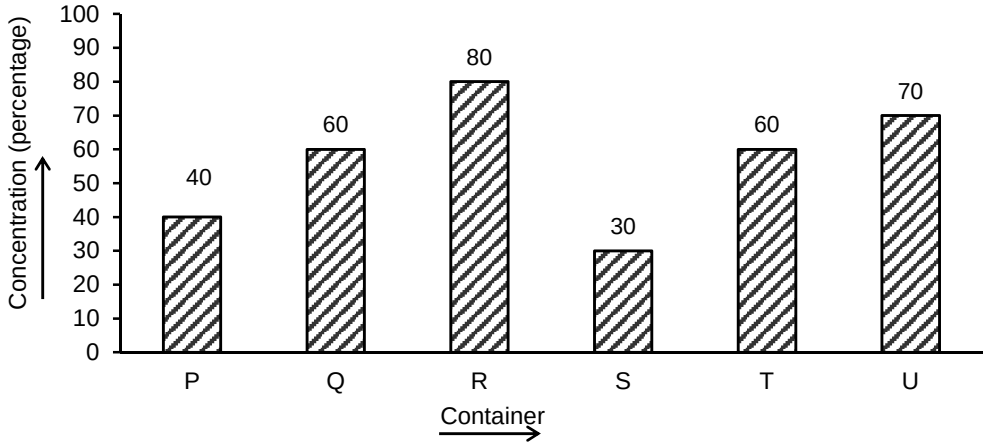
Maximum marks for each subject is 100 except for C and E for which it is 50.

10. Who got the highest total marks among the five students?
(A) Amar (B) Ajay (C) Antony (D) Akbar

11. If 5 points are given for topping a particular subject, 4 for being second and so on till 1 point for the 5th place, who scored the least number of points?
(A) Amar (B) Ajay
(C) Arun (D) Akbar

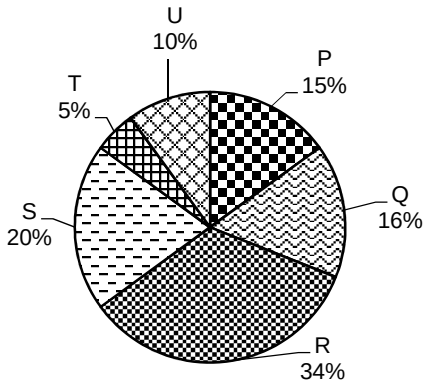
12. If all subjects had equal weight (total marks 100) who would have got the second highest total marks?
(A) Amar (B) Ajay
(C) Arun (D) Antony

Directions for questions 13 to 17: Answer the following questions based on the information given below.



Each of six different containers, labelled from P through U, contains some solution of milk and water with the concentration of milk (in percentage) specified as above.

Percentage distribution of the total volume of six solutions.



Total volume of all six solutions together = 100 litres

13. Which two solutions when mixed will yield a solution with maximum concentration?
(A) R and Q
(B) Q and U
(C) R and T
(D) R and U

14. Solutions P, Q, R are mixed in equal proportions and the resultant solution is labelled as X, while solutions S, T and U are mixed in equal proportions to give a solution labelled as Y. Which of the following is definitely true?
(A) The concentration of X is more than that of Y.
(B) The concentration of X is less than that of Y.
(C) The concentration of X is equal to that of Y.
(D) None of the above

15. What is the approximate concentration of the solution formed by mixing the entire volumes of R and S?
(A) 27%
(B) 55%
(C) 61.5%
(D) 64%

16. Which solution contains the maximum quantity of milk?
(A) Q
(B) R
(C) S
(D) T

17. How many pairs of solutions can be selected such that if (their entire volumes) are mixed, the concentration of the resulting solution will definitely be more than 50%?
(A) 8
(B) 9
(C) 10
(D) 11

Directions for questions 18 to 20: Answer the following questions based on the information given below.

The following table shows the growth in urban population since 1901 and the percentage of rural and urban population in the total population of India.

Year	Urban Population (in million)	Percentage of total population	
		Rural	Urban
1901	25·8	89·0	11·0
1911	25·9	89·6	10·4
1921	28·0	88·7	11·3
1931	33·5	87·8	12·2
1941	44·1	85·9	14·1
1951	62·4	82·4	17·6
1961	78·9	81·7	18·3
1971	108·9	79·8	20·2
1981	162·2	76·3	23·7
1991	217·6	74·3	25·7

18. The approximate percentage increase in the rural population from 1901 to 1991 was approximately
(A) 130% (B) 160%
(C) 210% (D) 240%

19. For which of the following periods was the percentage increase in the total population, the highest?
(A) 1951-1961 (B) 1961-1971
(C) 1971-1981 (D) 1981-1991

20. In the time period given, the only occasion when India's total population decreased was during
(A) 1901-1911
(B) 1911-1921
(C) 1921-1931
(D) 1931-1941

Key

Exercise – 9(a)

1. D	5. B	9. 4,080	13. C	17. D
2. A	6. 3	10. C	14. A	18. B
3. D	7. 2,07,500	11. D	15. D	19. A
4. D	8. 55,000	12. C	16. C	20. B

Exercise – 9(b)

1. D	5. 180	9. D	13. D	17. C
2. B	6. C	10. C	14. A	18. C
3. D	7. 216	11. D	15. C	19. C
4. B	8. C	12. B	16. B	20. B