

Chapter 3

Percentage

Percent: The term 'percent' is derived from the Latin word 'Per centum'. It implies "out of every hundred". The symbol '%' is used to denote percentage. For example, 15% means 15 out of 100. Each ratio can be expressed as a percentage.

For example, $\frac{1}{2}$ can be expressed as a percentage by multiplying by 100; $\frac{1}{2} \times 100 = 50\%$

A given percentage value can be converted to corresponding fraction by dividing by 100.

Example: $75\% = 75$ out of hundred $= \frac{75}{100} = \frac{3}{4}$

Percentage fraction conversion chart:

$$\frac{1}{2} = 50\%$$

$$\frac{5}{6} = 83\frac{1}{3}\%$$

$$\frac{2}{9} = 22\frac{2}{9}\%$$

$$\frac{1}{3} = 33\frac{1}{3}\%$$

$$\frac{1}{7} = 14\frac{2}{7}\%$$

$$\frac{1}{10} = 10\%$$

$$\frac{2}{3} = 66\frac{2}{3}\%$$

$$\frac{2}{7} = 28\frac{4}{7}\%$$

$$\frac{1}{11} = 9\frac{1}{11}\%$$

$$\frac{1}{4} = 25\%$$

$$\frac{3}{7} = 42\frac{6}{7}\%$$

$$\frac{2}{11} = 18\frac{2}{11}\%$$

$$\frac{3}{4} = 75\%$$

$$\frac{1}{8} = 12\frac{1}{2}\%$$

$$\frac{1}{12} = 8\frac{1}{3}\%$$

$$\frac{1}{5} = 20\%$$

$$\frac{3}{8} = 37\frac{1}{2}\%$$

$$\frac{5}{12} = 41\frac{2}{3}\%$$

$$\frac{2}{5} = 40\%$$

$$\frac{5}{8} = 62\frac{1}{2}\%$$

$$\frac{1}{15} = 6\frac{2}{3}\%$$

$$\frac{3}{5} = 60\%$$

$$\frac{7}{8} = 87\frac{1}{2}\%$$

$$\frac{1}{20} = 5\%$$

$$\frac{4}{5} = 80\%$$

$$\frac{1}{9} = 11\frac{1}{9}\%$$

$$\frac{1}{25} = 4\%$$

$$\frac{1}{6} = 16\frac{2}{3}\%$$

Formula to calculate percentage value: $y\% \text{ of } x = \left(\frac{y}{100} \right) \times x$

From the above formula, we have the following result: $x\% \text{ of } y = y\% \text{ of } x$. whenever we have two numbers a and b, one number can be expressed as a percentage of the other as follows:

$x \text{ as a percent of } y = \frac{x}{y} \times 100$, $y \text{ as a percent of } x = \frac{y}{x} \times 100$.

Percentage increase or decrease:

$$\text{Percentage increase} = \frac{\text{increase in the quantity}}{\text{original quantity}} \times 100$$

$$\text{Percentage decrease} = \frac{\text{decrease in the quantity}}{\text{original quantity}} \times 100$$

For example, if the net profit of a company grew from 50 crore in 2003 to 75 crore in 2004, then the percentage increase in the net profit from 2003 to 2004 is calculated as follows:
 increase in the net profit = (75 - 50) crore = 25 crore
 This increase is on Rs. 50 crore.

$$\text{So, Percentage increase} = \frac{\text{increase in profit from 2003 to 2004}}{\text{Net profit in 2003}} \times 100 = \frac{25}{50} \times 100 = 50\%$$

When a quantity increases or decreases by some percent, the new value of the quantity can be directly calculated as follows:

If the original quantity is 120 and it increases by 25%, then the new quantity is: $1.25 \times 120 = 150$

Similarly, if there is a decrease by 25% on 120, then the new quantity is: $0.75 \times 120 = 90$
 (Here, $1.25 = 1 + 0.25$, where 0.25 is equivalent to 25%)

(Here, $0.75 = 1 - 0.25$, where 0.25 is equivalent to 25%)

Some important conclusions:

(i) If x is a % more than y , then y is $\left(\frac{a}{100+a} \times 100\right)\%$ less than x .

(ii) If x is a % less than y , then y is $\left(\frac{a}{100-a} \times 100\right)\%$ more than x .

Example: If in an examination, the marks secured by Prerna are 20% less than that of Vinita, then marks secured by Vinita are how much percent more than prerna's marks?

Solution: $a = 20\%$

According to the above formula; Required percentage = $\left(\frac{a}{100-a} \times 100\right)\% = \frac{20}{80} \times 100 = 25\%$

(iii) If a number is first increased by $a\%$ and then decreased by $a\%$ then the net effect is always a decrease which is equal to ' $a\%$ of a ' i.e., $\frac{a^2}{100}\%$

Example: The salary of a worker is first increased by 5% and then it is decreased by 5%. What is the change in his salary?

Solution: Here $a = 5\%$

There will be a net decrease; Percent decrease = $\frac{a^2}{100}\% = \frac{5^2}{100}\% = 0.25\%$

(iv) If a quantity is first changed (increased or decreased) by $a\%$ and then changed (increased or decreased) by $b\%$, then

$$\text{Net change} = \left[\pm a \pm b + \frac{(\pm a)(\pm b)}{100} \right]\%$$

Net change is an increase or a decrease according to the positive or negative sign, respectively of the final result.

Example: The price of an article is first increased by 20% and then decreased by 25% due to reduction in sales. Find the net percent change in the final price of the article.

Solution: $a = 20\%$, $b = 25\%$

$$\text{Required percentage change} = \left(20 - 25 + \frac{20 \times (-25)}{100} \right)\% = (-5 - 5)\% = -10\%$$

So, there is a net decrease of 10% in the final price of the article as the final result is negative.

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(v) If the price of a commodity increases or decreases by a %, then the decrease or increase in consumption, so as not to increase or decrease the expenditure is equal to $\left(\frac{a}{100 \pm a}\right) \times 100\%$

(vi) If the population of a town is P and it increases (or decreases) at the rate of R% per annum, then

$$(i) \text{Population after } n \text{ years} = P \left(1 \pm \frac{R}{100}\right)^n$$

$$(ii) \text{Population } n \text{ years ago} = \frac{P}{\left(1 \pm \frac{R}{100}\right)^n}$$

(+' sign for increment; '-' sign for decrement).

Some tricks to calculate faster:

(i) Splitting the percentage into parts

Example: Find 51% of 128.

$$\text{Solution: } 51\% \text{ of } 128 = (50 + 1)\% \text{ of } 128 = 50\% \text{ of } 128 + 1\% \text{ of } 128 = 64 + 1.28 = 65.28$$

(ii) Interchanging the percentage value and the number

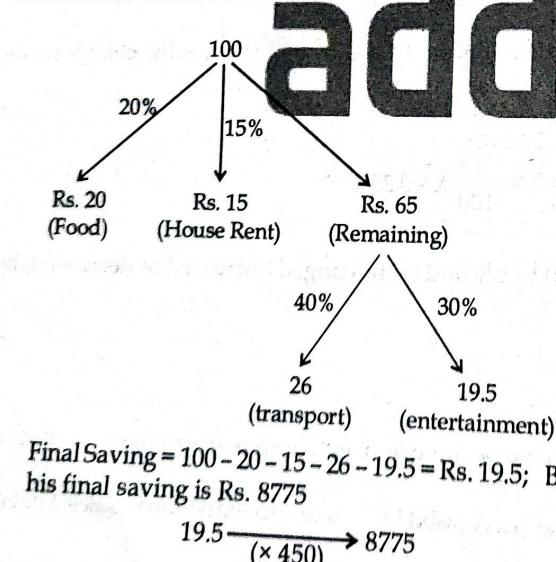
Example: Find 39% of 12.5

$$\text{Solution: } 39\% \text{ of } 12.5 = 12.5\% \text{ of } 39 = \frac{1}{8} \times 39 = 4.875$$

Types of Questions

1. Nikhil spent 20% of his monthly income on food and 15% on house rent. 40% of the remaining he spent on transport and 30% on entertainment. He is left with an amount of Rs. 8775 after all the expenditures. What is Nikhil's monthly income?

Sol. Let the income be Rs. 100



$$\text{So, Income} = \text{Rs. } 100 \times 450 = \text{Rs. } 45000.$$

2. If the price of a Commodity be raised by 40%, by how much percent must a householder reduce his consumption of that commodity, so as not to increase his expenditure?

Sol. Here, $a = 40\%$; According to the formula, Reduction in Consumption

$$= \left(\frac{40}{(100+40)} \times 100 \right)\% = \frac{40}{140} \times 100 = \frac{200}{7}\% = 28\frac{4}{7}\%$$

The population of a town is 352800. If it increases at the rate of 5% per annum, then what will be its population 2 years hence. Also, find the population 2 years ago.

Sol. $P = 352800, R = 5\%, n = 2$

Population after 2 years

$$= P \left(1 + \frac{R}{100}\right)^n = 352800 \times \left(1 + \frac{5}{100}\right)^2 = 352800 \times \frac{21}{20} \times \frac{21}{20} = 388962$$

Population 2 years ago

$$= \frac{P}{\left(1 + \frac{R}{100}\right)^n} = \frac{352800}{\left(1 + \frac{5}{100}\right)^2} = 352800 \times \frac{20}{21} \times \frac{20}{21} = 320000$$

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4. There are 3 contestants P, Q and R in an election. P secured 20% of the votes and Q secured 70% of the remaining votes. If R secured 4800 votes, by how many votes has the winner won the election?

Sol. Let the total number of votes be 100.
P secured 20% = 20 votes.

$$\text{Remaining votes} = 100 - 20 = 80$$

$$Q \text{ secured } 70\% \text{ of } 80 = 56 \text{ votes.}$$

$$R \text{ secured } (80 - 56) = 24 \text{ votes.}$$

But R secured 4800 votes.

$$24 \xrightarrow{(\times 200)} 4800$$

So, winner Q won the election by $56 - 24 = 32$ votes

$$32 \xrightarrow{(\times 200)} 6400 \Rightarrow 6400 \text{ votes}$$

QUANTITATIVE APTITUDE

5. Rahul answered 40% of the first 75 questions correctly in an examination consisting of 150 questions. Find the percentage of the remaining 75 questions that he needs to answer correctly in order to answer 60% of the total number of questions correctly?

Sol. 60% of total number of question = 60% of 150 = 90 questions

Number of questions that Rahul answered correctly in the first 75 questions = $\frac{40 \times 75}{100} = 30$

Number of questions from the remaining 75 questions that he should answer correctly = $90 - 30 = 60$

$$\text{Required percentage} = \frac{60}{75} \times 100 = 60 \times \frac{4}{3} = 80\%$$

Foundation

Questions

1. 3.5 can be expressed in terms of percentage as:

- (a) 0.35% (b) 3.5% (c) 35%

~~(d) 350%~~ (e) None of these

2. What is 15 percent of Rs. 34.?

- (a) Rs. 3.40 (b) Rs. 3.75 (c) Rs. 4.50

~~(d) Rs. 5.10~~ (e) None of these

3. $88\% \text{ of } 370 + 24\% \text{ of } 210 = ? = 118$

- (a) 256 (b) 258 (c) 268

~~(d) 358~~ (e) None of these

4. $860\% \text{ of } 50 + 50\% \text{ of } 860 = ?$

- (a) 430 (b) 516 (c) 860

~~(d) 960~~ (e) None of these

5. 60% of 264 is the same as

- (a) 10% of 44 ~~(b) 15% of 1056~~ (c) 30% of 132

~~(d) 17% of 544~~ (e) None of these

6. 270 candidates appeared for an examination, of which 252 passed. The pass percentage is?

- (a) 80% (b) $83\frac{1}{2}\%$ (c) $90\frac{1}{3}\%$

- ~~(d) $93\frac{1}{3}\%$~~ (e) None of these

7. What percent of Rs. 2650 is Rs. 1987.50?

- (a) 60% ~~(b) 75%~~ (c) 80%

~~(d) 85%~~ (e) None of these

8. What percent of a day is 3 hours?

- ~~(a) $12\frac{1}{2}\%$~~ (b) $16\frac{1}{3}\%$ (c) $18\frac{2}{3}\%$

- ~~(d) $22\frac{1}{2}\%$~~ (e) None of these

9. How many litres of pure acid are there in 8 litres of a 20% solution?

- (a) 1.4 (b) 1.5 ~~(c) 1.6~~

~~(d) 2.4~~ (e) None of these

10. Which one of the following shows the best percentage?

- (a) $\frac{384}{540}$ ~~(b) $\frac{425}{500}$~~ (c) $\frac{570}{700}$

- ~~(d) $\frac{480}{660}$~~ (e) None of these

11. $0.15\% \text{ of } 33\frac{1}{3}\% \text{ of } \text{Rs. } 10,000 \text{ is?}$

- (a) Rs. 0.05 ~~(b) Rs. 5~~ (c) Rs. 105

~~(d) Rs. 150~~ (e) None of these

12. $45\% \text{ of } 1500 + 35\% \text{ of } 1700 = ? \% \text{ of } 3175$ *40 ans.*

- (a) 30 (b) 35 (c) 45

~~(d) 50~~ (e) None of these

13. An agent gets a commission of 2.5% on the sales of cloth. If on a certain day, he gets Rs. 12.50 as commission, the cloth sold through him on that day is worth?

- (a) Rs. 250 ~~(b) Rs. 500~~ (c) Rs. 750

~~(d) Rs. 1250~~ (e) None of these

14. If Rs. 2800 is $\frac{2}{7}$ th of the value of a house, the worth of the house (in Rs.) is?

- (a) 8,00,000 ~~(b) 9,80,000~~ (c) 10,00,000

~~(d) 12,00,000~~ (e) None of these

15. If 35% of a number is 175, then what percent of 175 is that number?

- ~~(a) 35%~~ (b) 65% ~~(c) 280%~~

~~(d) 420%~~ (e) None of these

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16. If 35% of a number is 12 less than 50% of that number, then the number is:
 (a) 40 (b) 50 (c) 60
 (d) 80 (e) None of these
17. What percentage of numbers from 1 to 70 have squares that end in the digit 1?
 (a) 1% (b) 14% (c) 20%
 (d) 21% (e) None of these
18. If 75% of a number is added to 75, then the result is the number itself. The number is:
 (a) 50 (b) 60 (c) 300
 (d) 400 (e) None of these
19. The sum of two numbers is 2490. If 6.5% of one number is equal to 8.5% of the other, then the numbers are:
 (a) 989, 1501 (b) 1011, 1479 (c) 1401, 1089
 (d) 1411, 1079 (e) None of these
20. When any number is divided by 12, then dividend comes $\frac{1}{4}$ th of the other number. By how much percent first number is greater than the second number?
 (a) 150 (b) 200 (c) 300
 (d) Data inadequate (e) None of these
21. If one number is 80% of the other and the sum of their square is 656, then the numbers are:
 (a) 4, 5 (b) 8, 10 (c) 16, 20
 (d) 14, 12 (e) None of these
22. A person's salary has increased from Rs. 7200 to Rs. 8100. What is the percentage increase in his salary?
 (a) 25% (b) 18% (c) $16\frac{2}{3}\%$
 (d) $12\frac{1}{2}\%$ (e) None of these
23. A's salary is 20% less than B's salary. Then B's salary is more than A's salary by:
 (a) $33\frac{1}{2}\%$ (b) $16\frac{2}{3}\%$ (c) 20%
 (d) 25% (e) None of these
24. If the price of petrol is increased by 20%, by what percentage should the consumption be decreased by the consumer, if the expenditure on petrol remains unchanged?
 (a) $16\frac{2}{3}\%$ (b) $6\frac{2}{3}\%$ (c) 8%
 (d) 15% (e) None of these
25. The price of an article of Rs. 100. Its price is increased by 10%, then again its price is increased by 10%. How much is increased in total price?
 (a) 20 (b) 21 (c) 110
 (d) 121 (e) None of these
26. An agent sells goods of value of Rs. 15000. The commission which he receives is $12\frac{1}{2}\%$, is what amount?
 (a) Rs. 1875 (b) Rs. 2125 (c) Rs. 2000
 (d) Rs. 2700 (e) None of these
27. The monthly income of a person is Rs. 5000. If his income is increased by 30%, then what is his monthly income now?
 (a) Rs. 7000 (b) Rs. 5500 (c) Rs. 4500
 (d) Rs. 6500 (e) None of the above
28. The price of a certain article is Rs. 15000. But due to slump in the market, its price decrease by 8%. Find the new price of the article?
 (a) Rs. 14000 (b) Rs. 13800 (c) Rs. 16500
 (d) Rs. 12600 (e) None of these
29. A man losses 20% of his money. After spending 25% of the remainder, he has Rs. 480 left. What is the amount of money he originally had?
 (a) Rs. 600 (b) Rs. 720 (c) Rs. 720
 (d) Rs. 840 (e) None of these
30. 15% of 10% of 20% of 1000 is?
 (a) 1.50 (b) 67 (c) 150
 (d) 3 (e) None of these
31. If the numerator of a fraction is increased by 120% and denominator is also increased by 350% then the fraction become $\frac{11}{27}$ what was fraction?
 (a) $\frac{4}{5}$ (b) $\frac{5}{6}$ (c) $\frac{6}{5}$
 (d) $\frac{5}{4}$ (e) None of these
32. If 40% of a number is equal to two-third of another number, what is the ratio of first number to the second number?
 (a) 2 : 5 (b) 3 : 7 (c) 5 : 3
 (d) 7 : 3 (e) None of these
33. A batsman scored 110 runs which included 3 boundaries and 8 sixes. What percent of his total score did he make by running between the wickets?
 (a) 45% (b) $45\frac{5}{11}\%$ (c) $54\frac{6}{11}\%$
 (d) 55% (e) None of these
34. If $50\% \text{ of } (x-y) = 30\% \text{ of } (x+y)$, then what percent of x is y?
 (a) 20% (b) 25% (c) 30%
 (d) 40% (e) None of these
35. In expressing a length 81.472 km as nearly as possible with three significant digits, find the percentage error?

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- (a) 0.1% (b) 0.034% (c) 0.0020%
 (d) 0.4% (e) None of these
- 36.** Difference of two numbers is 1600. If 7.5% of one number is 12.5% of the other number, find the two numbers?
 (a) 2490, 4000 (b) 2400, 4150 (c) 2490, 4150
 (d) 2500, 4200 (e) None of these
- 37.** Sixty-five percent of a number is 21 less than four-fifth of that number. What is the number?
 (a) 100 (b) 120 (c) 140
 (d) 160 (e) 180
- 38.** An inspector rejects 0.08% of the meters as defective. How many will he examine to reject 2?

QUANTITATIVE APTITUDE

- (a) 2000 (b) 2200 (c) 2500
 (d) 2800 (e) None of these
- 39.** Which is greatest number?
 (a) $16\frac{2}{3}\%$ (b) $\frac{2}{15}$ (c) $\frac{1}{11}$
 (d) 0.17 (e) $\frac{2}{5}\%$
- 40.** $16\frac{2}{3}\%$ of 600 gm - $33\frac{1}{3}\%$ of 180 gm
 (a) 20 gm (b) 30 gm (c) 40 gm
 (d) 60 gm (e) None of these

Moderate

- 1.** In an examination it is required to get 35% of the aggregate marks to pass Rishu got 216 marks and declared failed by 5% marks then what was the total marks?
 (a) 620 (b) 720 (c) 820
 (d) 710 (e) None of these
- 2.** The price of Petrol went up 20%. In order to keep expenses same Ram must reduce travel by:
 (a) 25% (b) 30% (c) 33.33%
 (d) 16.67% (e) None of these
- 3.** If the length and breadth of a rectangle field are increased. The area increased by 50%. If the length increased by 20%, by what percentage was breadth increased?
 (a) 25% (b) 30% (c) 20%
 (d) Data inadequate (e) None of these
- 4.** Aditya's salary is 80% of Amit's salary and 120% of Rajiv's salary. What is Amit's salary if Rajiv's salary is 30,000?
 (a) 40000 (b) 45000 (c) 50000
 (d) 55000 (e) None of these
- 5.** In a class 60% of the students pass in Hindi and 45% pass in Sanskrit. If 25% of them pass in both subjects, what percentage of the students fails in both subjects?
 (a) 80% (b) 20% (c) 25%
 (d) 75% (e) None of these
- 6.** An arc contains 23% copper. To get 69% of copper the quantity of the arc required is:
 (a) 200 (b) 250 (c) 300
 (d) 400 (e) None of these
- 7.** Rice is now being sold at Rs. 30 per kg. During last month its rate was Rs. 26 per kg. Find by how much percentage must a family reduce its consumption to keep the expenditure fixed?
 (a) $12\frac{1}{2}\%$ (b) $13\frac{1}{3}\%$ (c) 14%
 (d) 15% (e) None of these

8. Aditya salary was increased by 40% and then decreased by 25%. Find out net effect in Aditya's salary?

- (a) 4% increase (b) 3% increase (c) 5% increase
 (d) 6% increase (e) None of these

9. In a certain school, 20% of students are below 8 years of age. The number of students above 8 years of age is $\frac{2}{3}$ of the number of students of 8 years age which is 48. What is the total number of students in the school?

- (a) 72 (b) 80 (c) 120
 (d) 150 (e) 100

10. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. What is the percentage error in the calculation?

- (a) 34% (b) 44% (c) 54%
 (d) 64% (e) None of these

11. In an election between two candidates, one got 55% of the total valid votes, 20% of the votes were invalid. If the total number of votes was 7500, the number of valid votes that the other candidate got, was?

- (a) 2700 (b) 2900 (c) 3000
 (d) 3100 (e) None of these

12. Three candidates contested an election and received 1136, 7636 and 11628 votes respectively. What percentage of the total votes did the winning candidate get?

- (a) 57% (b) 60% (c) 65%
 (d) 90% (e) None of these

13. Rajeev buys good worth Rs. 6650. He gets a rebate of 6% on it. After getting the rebate, he pay sales tax @ 10%. Find the amount he will have to pay for the goods?

- (a) Rs. 6876.10 (b) Rs. 6999.20 (c) Rs. 6654
 (d) Rs. 7000 (e) None of these

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14. The population of a town increased from 1,75,000 to 2,62,500 in a decade. The average percent increase of population per year is?
 (a) 4.37% (b) 5% (c) 6%
 (d) 8.75% (e) None of these
15. In an examination, A candidate obtains 25% marks and fails by 45 marks while another candidate obtains 46% marks and passed by 15% marks. What are the passing marks?
 (a) 600 (b) 675 (c) 700
 (d) 750 (e) None of these
16. Aditya has some amount out of which 25% is stolen in bus, 10% he gave to his friend, 50% of remainder is spent in party and rest Rs. 26 gave to his mother. What was his initial amount?
 (a) 1230 (b) 80 (c) 160
 (d) 90 (e) None of these
17. If A's salary is 20% higher than B then how much B salary is less than A's salary?
 (a) 20% (b) 25% (c) 16.67%
 (d) $33\frac{1}{3}\%$ (e) None of these
18. If a number is increased by 20% and then reduced by 20%. After this operation the number?
 (a) does not change (b) increase by 1%
 (c) 4% increase (d) 4% decrease
 (e) 1% decrease
19. If $\frac{3}{5}$ of a number is 23 more than 50% of the same number, then what will be 80% of the number?
 (a) 230 (b) 174 (c) 23
 (d) 184 (e) None of these
20. Two numbers are respectively 20% and 30% less than third number. What is the second number as a percentage of the first?
 (a) 87.5% (b) 88% (c) 77.5%
 (d) 87% (e) 97.5%
21. The sum of two numbers is $\frac{23}{20}$ of the first number. The second number is what percent of the first?
 (a) 5% (b) 10% (c) 15%
 (d) 20% (e) None of these
22. In an examination it is required to multiply a number with 7 but by mistake a student divide it by 7 then what is error percent?
 (a) 7% (b) 97.96% (c) 91%
 (d) 49% (e) None of these
23. 405 toffees were distributed equally among children in such a way that the number of toffees received by each child is 20% of total number of children. How many toffees did each child got?
 (a) 40 (b) 30 (c) 42
 (d) 55 (e) None of these
24. Ram scored 30% marks and failed by 15 marks. Aditya score 40% marks and obtained 35 marks more than those required to pass. The pass percentage is?
 (a) 33% (b) 38% (c) 43%
 (d) 46% (e) None of these
25. The price of sugar is reduced by 2%. How many kg of sugar can now be bought for the money which was sufficient to buy 49 kg of sugar earlier?
 (a) 1 kg less (b) 1 kg more (c) 2 kg more
 (d) 2 kg less (e) None of these
26. Aditya's salary is 125% of Ram's salary. Sanjay's salary is 80% of Ram's salary. If the total of all the three salaries is Rs. 61000. What is Sanjay's salary?
 (a) 10000 (b) 12000 (c) 15000
 (d) 16000 (e) None of these
27. If A is 150% of B then B is what percent of A+B?
 (a) 30% (b) 35% (c) 40%
 (d) 45% (e) None of these
28. If in the examination 20% failed in Hindi, 25% failed in English and 7% failed in both subject then the percentage of student who failed in atleast one of the subjects?
 (a) 50% (b) 45% (c) 55%
 (d) 38% (e) None of these
- If 30% students failed in English, 45% failed in Math and 25% failed in both then the student who pass in both subject is?
 (a) 38% (b) 55% (c) 70%
 (d) 50% (e) None of these
30. Population of Delhi increases by 10% every year. If the current population of Delhi is 1,331,000 then what was its population 3 years ago?
 (a) 1000000 (b) 25000 (c) 10000000
 (d) 1543200 (e) None of these
31. A, B, C shared Rs. 18500 so that A received 25% more than B and B received 20% more than C then what amount did A received?
 (a) 7000 (b) 5000 (c) 7500
 (d) 8000 (e) None of these
32. If the price of a shirt is increased by 25% and then decreased by 30% then what will be net effect?
 (a) 12% increase (b) 12% decrease
 (c) 12.5% increase (d) 12.5% decrease
 (e) None of these

33. Nutan got 456 marks in an exam. Aditya got 54% marks in same exam which is 24 less than Nutan. The minimum passing marks in exam is 35%. Then how much marks did nutan get more than passing marks?
- (a) 280 (b) 456 (c) 180
 (d) 176 (e) None of these
34. 1200 boy and 650 girls appeared in examination. If 70% of boy and 40% of girls failed. Find the approximate percentage of passed students?
- (a) 30% (b) 41% (c) 50%
 (d) Can't determine (e) None of these
35. Aditya's monthly salary is 15% more than Sanjay's Monthly salary. If Aditya's monthly salary is 17250 than what is Sanjay's annual salary?
- (a) 150000 (b) 170000 (c) 180000
 (d) 250000 (e) None of these
36. The population of Delhi two years ago was 55000. It increased by 12% in the first year and decreased by 15% in the second year. What was the population of town at the end of 2 years?
- (a) 7084 (b) 70804 (c) 70840
 (d) Can't determine (e) None of these
37. If the length of rectangle is increased by 20% and breadth is decreased by 10% then what will be impact on area?
- (a) 5% increase (b) 10% increase (c) 20% decrease
 (d) 8% increase (e) None of these
38. If the length of rectangle is increased by 20% and breadth is decreased by 10% then what will be impact on perimeter?
- (a) 10% increase (b) 20% decrease
 (c) 5% increase (d) 8% increase
 (e) Cannot be determined
39. Ram gets 20% marks more than Girish. Girish get 20% more than Sanjay. Sanjay gets 20% less than Aditya. If Ram got 576 marks and total marks were 800 then what marks did Aditya get?
- (a) 600 (b) 480 (c) 500
 (d) 600 (e) None of these
40. The product of one third of a number and 150% of another number is what percent of product of the given numbers?
- (a) 30% (b) 35% (c) 39%
 (d) 45% (e) None of these

Difficult

1. Ram borrowed Rs. 725 from Shyam at the beginning of a year at interest. After 8 months, he again borrowed Rs. 362.50 at a rate of interest double that the former sum bears. At the end of the year, the sum of interest on both loans is Rs. 43.50. Find the first rate of interest per annum?
- (a) 4.5% (b) 4.75% (c) 6.25%
 (d) 7.2% (e) None of these
2. The cost price of goods with a bankrupt is Rs. 2500 and if the goods had realised in their full value, his creditors would have received 85 paise in the rupee. But $\frac{2}{5}$ of the goods were sold at 17% and the remainder at 22% below their cost price. How many paise in a rupee was received by the creditors?
- (a) 72 paise (b) 68 paise (c) 55 paise
 (d) 52 paise (e) None of these
3. A Shopkeeper undertakes to supply 2000 tables at Rs. 1725 each. He estimates that if 10% are defective which will be sold at 50%, then the profit will be 15% on his whole outlay. When the tables were supplied, 70% of the tables were found defective. What loss did the Shopkeeper incur?
- (a) Rs. 607500 (b) Rs. 557500 (c) Rs. 550500
 (d) Rs. 80680 (e) None of these
4. Sweta invested Rs. 10,000 in a scheme exactly three years ago. The value of the investment increased by 10% during the first year, increased by 5% during the second year, and decreased by 10% during the third year. What is the value of the investment today?
- (a) Rs. 10,500 (b) Rs. 10,395 (c) Rs. 10,342
 (d) Rs. 10,230 (e) None of these
5. In Mumbai, 60% of the registered voters are BJP-supporters and the rest are Congress-supporters. In a mayoral race, if 75% of the registered voters who are BJP-supporters and 20% of the registered voters who are Congress-supporters are expected to vote for candidate X, what percent of the registered voters are expected to vote for candidate X?
- (a) 53% (b) 55% (c) 57%
 (d) 59% (e) None of these
6. A pharmaceutical company received Rs. 3 million in royalties on the first Rs. 20 million in sales of the generic equivalent of one of its products and then Rs. 9 million in royalties on the next Rs. 108 million in sales. By approximately what percent did the ratio of royalties to sales decrease from the first Rs. 20 million in sales to the next Rs. 108 million in sales?
- (a) 10.27% (b) 20.63% (c) 38.6%
 (d) 44.44% (e) None of these
7. In Jamshedpur, only two newspapers Dainik Jagran and Prabhat Khabar are published. It is known that 25% of the city population reads Dainik Jagran and 20% reads Prabhat Khabar while 8% reads both the newspapers. It is also known that 30% of those who

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read Dainik Jagran but not Prabhat Khabar look into advertisement and 40% of those who read Prabhat Khabar but not Dainik Jagran look into advertisement while 50% of those who read both the newspapers look into advertisements. What is the percentage of the population who read an advertisement?

- (a) 13.9% (b) 15.8% (c) 17.2%
 (d) 21.4% (e) None of these

8. In my office, at least 50% of the people read an e-newspaper. Among those who read an e-newspaper, at most 25% read more than one e-paper. Only one of the following statements follows from the statements given below. Which one is it?
 (a) At the most 37.5% read exactly one e-paper.
 (b) At least 37.5% read exactly one e-paper.
 (c) At the most 19.8% read exactly one e-paper.
 (d) At least 19.8% read exactly one e-paper.
 (e) none of these

9. In Convent Model School, 60% of the students are boys. In an aptitude test, 80% of the girls scored more than 40 marks (out of a maximum possible 150 marks). If 60% of the total students scored more than 40 marks in the same test, find the fraction of the boys who scored 40 marks or less?

- (a) $\frac{3}{5}$ (b) $\frac{6}{7}$ (c) $\frac{5}{7}$
 (d) $\frac{7}{15}$ (e) None of these

10. In a recent opinion poll held during April, 60% of the respondents favoured India Against Corruption (IAC) while the rest favoured Indian political parties (IPP). It was found in May polls that 10% of IAC supporters switched their preference to IPP, while the same percentage of IPP's supporters also switched their preference to IAC. What percentage of the electorate should now switch their preference from IAC to IPP so that they are at par?
 (a) 14% (b) 19% (c) 24%
 (d) 29% (e) None of these

11. Suman's project report on 'Development with dignity', consists of 25 pages each of 60 lines with 75 characters on each line. In case the number of lines is reduced to 55 but the number of characters is increased to 90 per lines, what is the percentage change in the number of pages. (Assume the number of pages to be a whole number.)
 (a) -8% (b) +8% (c) +12%
 (d) 80% (e) None of these

12. Visions Pvt. Ltd. Appoints a sales representative on the basic salary of Rs. 1200 per month and the condition that for every sales of Rs. 10000 above Rs.10000, he will get 50% of basic salary and 10% of

the sales as a reward. There is no incentive for the first Rs. 10000 of sales. What should be the value of sales if the sales representative wants to earn Rs. 7600 in a particular month?

- (a) Rs. 120000 (b) Rs. 50000 (c) Rs. 80000
 (d) Rs. 45000 (e) None of these

13. Neha has a watch which gain 2% per hour when the temperature is in the range of 40°C - 50°C and it loses at the same rate when the temperature is in the range of 20° - 30°C . The watch runs on time in all other temperature ranges. On a sunny day, the temperature started soaring up from 8 a.m. in the morning at the uniform rate of 2°C per hour and during the afternoon it stated coming down at the same rate. Find what time will it be by the watch at 7 p.m. if at 8 a.m. the temperature was 32°C and at 4 p.m. it was 40°C ?
 (a) 5 : 12 : 42 p.m. (b) 6 : 28 : 33 p.m.
 (c) 7 : 04 : 48 p.m. (d) None of these
 (e) None of these

14. In laptop market, only three competitors (Lenovo, Apple and Samsung) exist. Last year the sales of apple laptops were 10% more than Lenovo. In year, both the firms Lenovo and Apple increased their respective sales by 20%. This year, the sales of the firm Apple are five times that of Samsung. How much were the sales of the firm (approx.) Samsung last year, if the total sales remained constant over the two years period?

- (a) 25% (b) 32% (c) 38%
 (d) 41% (e) None of these

15. Two jars contain equal quantities of 40% alcohol. Swati changed the concentration of the first jar to 50% by adding extra quantity of pure alcohol. Sonali changed the concentration of the second jar to 50% replacing a certain quantity of the solution with pure alcohol. By what percentage is the quantity of alcohol added by Swati more than that replaced by Sonali?

- (a) 10% (b) 20% (c) 30%
 (d) 40% (e) None of these

16. For admission in a post graduate program of Calcutta University, 90% of the candidates who appeared for the written test were males and the rest were females, 60% of the males and 80% of the females passed in the written test. What is the total number of students who appeared for the written test, if the total number of passed candidates was 1240?
 (a) 1380 (b) 1560 (c) 2000
 (d) 2500 (e) None of these

17. In a gram panchayat meeting, 1000 people voted on a resolution with 10% of the votes being invalid. After some discussion 1000 people voted again. This time there were 20% invalid votes. The opponents were

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- increased by 50% while the motion was now rejected by a majority, which is 300% more than it was formerly passed by. How many people voted against the resolution before the discussion?
- 700
 - 600
 - 500
 - 400
 - None of these
18. An index of 12 shares contains, among others, the shares of Vision Power, Vision Infra and Vision Communication with weightage of 7%, 13% and 15% respectively. What is the increase in the prices of other shares, if these three rise by 9%, 10% and 4% respectively, while the index rises by 6%?
- 5.34%
 - 5.94%
 - 6.23%
 - Can't be determine
 - None of these
19. A, B and C start a business by investing Rs. 70000 that earns them a profit of Rs. 42000 at the end of the year. A invests his share in the profit in a scheme that gives her 10% interest compounded annually

QUANTITATIVE APTITUDE

- and B invests his share in a scheme that gives her 20% interest compounded annually. A gets Rs. 2520 as interest at the end of 2 years and B gets an interest of Rs. 4200 at the end of one year. Find C's investment in the business?
- Rs. 10000
 - Rs. 15000
 - Rs. 20000
 - Rs. 25000
 - None of these
20. Sashi has Rs. 90000 with him. He purchases a mobile, an i-pad and a laptop for Rs. 15000, Rs. 13000 and Rs. 35000 respectively and puts the remaining money in his bank account which pays 15% per annum compound interest. After 2 years he sells off the three items at 80% of their original price and also withdraws his entire money from the bank by closing the account. What is the total change in his asset?
- 5.31%
 - 4.31%
 - 4.32%
 - 4.32%
 - None of these

Previous Year (Memory Based)

1. What is the 40% of 50% of $\frac{3}{4}$ th of 3200?
- 480
 - 560
 - 420
 - 600
 - None of these
2. One-fifth of a number is 62. What will 73% of that number be?
- 198.7
 - 212.5
 - 226.3
 - 234.8
 - None of these
3. Two-thirds of three-fourths of one-fifth of a number is 15. What is 30 per cent of that number?
- 45
 - 60
 - 75
 - 30
 - None of these
4. $\frac{3}{4}$ th of $\frac{2}{3}$ rd of $\frac{1}{5}$ th of a number is 249.6. What is 50% of that number?
- 3794
 - 3749
 - 3734
 - 3739
 - None of these
5. Ishan spent Rs. 35645 on buying a bike Rs. 24355 on buying a television and the remaining 20% of the total amount he had as cash with him. What was the amount?
- Rs. 60000
 - Rs. 72000
 - Rs. 75000
 - Rs. 80000
 - None of these
6. Sonal spent Rs. 45760 on the interior decoration for her home, Rs. 27896 on buying air conditioner and the remaining 28% of the total amount she had as cash with her. What was the total amount?
- Rs. 98540
 - Rs. 102300
 - Rs. 134560
 - Cannot be determined
 - None of these
7. Rajesh spent Rs. 44620 on Deepawali shopping, Rs. 32764 on buying computer and the remaining 32% of the total amount he had as cash with him. What was the total amount?
- Rs. 36416
 - Rs. 113800
 - Rs. 77384
 - Cannot be determined
 - None of these
8. Harjeet spends 50% of his monthly income on household items, 20% of his monthly income on buying clothes, 5% of his monthly income on medicines and the remaining amount of Rs. 11250 he saves. What is Harjeet's monthly income?
- Rs. 38200
 - Rs. 34000
 - Rs. 41600
 - Rs. 45000
 - None of these
9. Mr. Giridhar spends 50% of his monthly income on household items and out of the remaining he spends 50% on transport, 25% on entertainment, 10% on sports and remaining amount of Rs. 900 is saved. What is Mr. Giridhar's monthly income?
- Rs. 6000
 - Rs. 12000
 - Rs. 9000
 - Cannot be determined
 - None of these
10. Shruti decided to donate 12% of her salary to an orphanage. On the day of donation, she changed her mind and donated Rs. 3150 which was 75% of what she had decided earlier. How much is Shruti's salary?
- Rs. 35000
 - Rs. 42500
 - Rs. 39100
 - Cannot be determined
 - None of these
11. Asha's monthly income is 60% of Deepak's monthly income, 120% of Maya's monthly income. What is Maya's monthly income, if Deepak's monthly income is Rs. 78000?
- Rs. 39000
 - Rs. 42000
 - Rs. 36000
 - Cannot be determined
 - None of these

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- 12.** A sum of Rs. 2236 is divided among A, B and C such that A receives 25% more than C and C receives 25% less than B. What is A's share in the amount?
 (a) Rs. 460 (b) Rs. 890 (c) Rs. 780
 (d) Rs. 1280 (e) None of these
- 13.** Pooja invests 13% of her monthly salary, i.e., Rs. 8554 in Mediclaim Policies. Later she invest 23% of her monthly salary on Child Education Policies, she also invests another 8% of her monthly salary on Mutual Funds. What is the total annual amount invested by Pooja?
 (a) Rs. 28952 (b) Rs. 43428 (c) Rs. 347424
 (d) Rs. 173712 (e) None of these
- 14.** Mr. Sarang invests 6% of his monthly salary, i.e., Rs. 2,100 on insurance policies. He also invests 8% of his monthly salary on Family Mediclaim Policies and another 9% of his salary on NSCs. What is the total annual amount invested by Mr. Sarang?
 (a) Rs. 11400 (b) Rs. 96600 (c) Rs. 8050
 (d) Rs. 9500 (e) None of these
- 15.** Mrs. Jain invests 14% of her monthly salary, i.e., Rs. 7014 in Insurance Policies. Later she invests 21% of her monthly salary on Family Mediclaim Policies; also she invests another 6.5% of her salary on Mutual Funds. What is the total annual amount invested by Mrs. Jain?
 (a) Rs. 25050 (b) Rs. 50100 (c) Rs. 242550
 (d) Rs. 249498 (e) None of these
- 16.** Rita invested 25% more than Sunil. Sunil invested 30% less than Abhinav who invested Rs. 6000. What is the respective ratio between the amount that Rita invested and the total amount invested by all of them together?
 (a) 35 : 104 (b) 13 : 29 (c) 101 : 36
 (d) 35 : 103 (e) None of these
- 17.** Deepthi invests 11% of her monthly salary, i.e., Rs. 5236 in Fixed Deposits. Later she invests 19% of her monthly salary on Life Insurance Policies; also she invests another 7% of her monthly salary on Mutual Funds. What is the total annual amount invested by Deepthi?
 (a) Rs. 211344 (b) Rs. 17612 (c) Rs. 105672
 (d) Rs. 35224 (e) None of these
- 18.** In a class of 80 students, each student got sweets that are 15% of the total number of students. How many sweets were there?
 (a) 1200 (b) 850 (c) 900
 (d) Cannot be determined (e) None of these
- 19.** In a class of 50 students and 5 teachers, each student got sweets that are 12% of the total number of students and each teacher got sweets that are 20% of the total number of students. How many sweets were there?
 (a) 345 (b) 365 (c) 330
 (d) 350 (e) None of these
- 20.** In a class of 80 students and 5 teachers, each student got sweets that are 15% of the total number of students and each teacher got sweets that are 25% of the total number of students. How many sweets were there?
 (a) 1030 (b) 1040 (c) 1050
 (d) 1060 (e) None of these
- 21.** A candidate appearing for an examination has to secure 35% marks to pass. But he secured only 41 marks and failed by 30 marks. What would be the maximum marks of test?
 (a) 280 (b) 180 (c) 200
 (d) 150 (e) 210
- 22.** Raja got 76 per cent marks and Seema got 480 marks in a test. The maximum marks of the test is equal to the marks obtained by Raja and Seema together. How many marks did Raja score in the test?
 (a) 1450 (b) 1520 (c) 1540
 (d) 2000 (e) None of these
- 23.** On a test consisting of 150 questions, Rita answered 40% of the first 75 questions correctly. What per cent of the other 75 questions does she need to answer correctly for her grade on the entire exam to be 60%?
 (a) 80 (b) 70 (c) 40
 (d) 50 (e) None of these
- 24.** In an election between two candidates, one got 52% of the total valid votes. 25% of the total votes were invalid. The total number of votes were 8400. How many valid votes did the other person get?
 (a) 3276 (b) 3196 (c) 3024
 (d) Cannot be determined (e) None of these
- In a college election between two candidates, one candidate got 55% of the total valid votes 15% of the votes were invalid. If the total votes were 15,200, what is the number of valid votes the other candidate got?
 (a) 7106 (b) 6840 (c) 8360
 (d) 5814 (e) None of these
- 26.** The population of a town was 48600. It increased by 25% in the first year and decreased by 8% in the second year. What will be the population of the town at the end of 2 years?
 (a) 65610 (b) 55580 (c) 60750
 (d) 64850 (e) None of these
- 27.** In a mixture of milk and water the proportion of water by weight was 75%. If in the 60 gm mixture 15 gm water was added, what would be the percentage of water? (weight in gm)?
 (a) 75% (b) 88% (c) 90%
 (d) 100% (e) None of these
- 28.** Find a single equivalent increase, if a number is successively increased by 10%, 20% and 25%?
 (a) 55% (b) 65% (c) 75%
 (d) 80% (e) None of these

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 29. The price per cent increase remains same? What is the price?

(a) 15%
 (d) 18%

30. An article price much be sold
 (a) 75%
 (d) 125%

31. In a market
 (a) 1920
 (d) 1800

32. In
 (a) 1000
 (d) 1500

33. 50%

34. 50%

1.

2.

3.

29. The price of rice has been increased by 20%. By what per cent should Sanjay reduce the consumption of rice in the family so that the expenditure on rice remains the same as before in increase in the price of rice?
- (a) $15\frac{2}{3}\%$ (b) $16\frac{2}{3}\%$ (c) 20%
 (d) 18% (e) None of these
30. An article is sold at a discount of 20% on the marked price. In order to gain 60% on marked price at how much more per cent of the discounted price it should be sold?
- (a) 75% (b) 25% (c) 65%
 (d) 200% (e) None of these
31. In an examination, it is required to get 256 of the total maximum aggregate marks to pass. A student gets 192 marks and is declared failed. The difference of marks obtained by the student and that required to pass is 10%. What are the maximum aggregate marks a student can get?
- (a) 690 (b) 670 (c) 640
 (d) 680 (e) None of these
32. In an election between two candidates, 60% of the voters cast their vote out of which 4% of the votes were declared invalid. A candidate got 7344 votes which were 75% of the total valid votes. Find the total no. of votes enrolled in the election?
- (a) 1700 (b) 17659 (c) 17000
 (d) 15000 (e) None of these
33. Samar spends 52% of his monthly salary on household expenditure and 23% on miscellaneous expenditure. If he is left with Rs. 4500, what is his monthly salary?
- (a) Rs. 16000 (b) Rs. 17500 (c) Rs. 17000
 (d) Rs. 18500 (e) None of these
- In a class of 60 students, 40% can speak only Hindi, 25% can speak only English and rest of the students can speak both the languages. How many students can speak English?
34. The price of a book is increased by 20% and then decreased by 15%. The final price is 120. What was the original price?
- (a) 100 (b) 110 (c) 120
 (d) 130 (e) None of these
35. A, B and C invested in a business in the ratio of 3 : 2 : 5 respectively. If A earns 100% more profit than B and C earns 40% more profit than B, then what is the share of B in the profit?
- (a) 32 (b) 28 (c) 36
 (d) 15 (e) None of these
36. Rajiv spends 20% of his salary on food, 15% on conveyance, 10% on education and 35% on house rent. If he spends Rs. 1950 on education, how much does he spend on conveyance?
- (a) Rs. 2925 (b) Rs. 2242.50 (c) Rs. 1300
 (d) Rs. 3000 (e) None of these
37. In 2009, the food production was 5.5 million tonnes and in 2010, the production was 4.4 million tonnes. Find out the percentage decrease in food production in these two years?
- (a) 18 (b) 20 (c) 16
 (d) 22 (e) None of these
38. After giving 25% discount on the entry ticket, the number of visitors increased by 30%. What will be its impact on the entry with respect to other days?
- (a) $2\frac{1}{2}\%$ decrease (b) $2\frac{1}{2}\%$ increase
 (c) 2% decrease (d) 2% increase
 (e) None of these
39. A man spends 75% of his income. His income is increased by 20% and he increases his expenditure by 10%. His saving is increased by.
- (a) 10% (b) 25% (c) 27%
 (d) 50% (e) None of these
40. At an election, a candidate got elected by fetching 63% of the total votes. If 54982 voters did not vote in favour of elected candidate, what was the total number of votes polled?
- (a) 87273 (b) 88680 (c) 148600
 (d) 203600 (e) None of these

Foundation

Solution

(d); 3.5 can be expressed as $(3.5 \times 100)\% = 350\%$

d); $\frac{15}{100} \times 34 = 5.10 \text{ Rs.}$

); $\frac{88}{100} \times 370 + \frac{24}{100} \times 210 - x = 118$

$x = 325.6 + 50.4 - 118 = 376 - 118 = 258$

4. (c); $\frac{860}{100} \times 50 + \frac{50}{100} \times 860 = \frac{860}{100} (50 + 50) = 860$

5. (b); $\frac{60}{100} \times 264 = 158.40 \Rightarrow \frac{15}{100} \times 1056 = 158.40$

6. (d); Passing percentage = $\frac{252}{270} \times 100 = 93\frac{1}{3}\%$

7. (b); Required percentage = $\frac{1987.50}{2650} \times 100 = 75\%$

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8. (a); Percentage = $\frac{3}{24} \times 100 = 12\frac{1}{2}\%$

9. (c); Litres of pure acid = $\frac{20}{100} \times 8 = 1.6$ litres

10. (b); Best percentage = $\frac{425}{500}$

11. (b); $\frac{15}{100 \times 100} \times \frac{100}{300} \times 10000 = \text{Rs. } 5$

12. (e); $\frac{45}{100} \times 1500 + \frac{35}{100} \times 1700 = \frac{x}{100} \times 3175$

$$\Rightarrow x = \frac{1270 \times 100}{3175} = 40$$

13. (b); Let the worth of cloth be x

$$x \times \frac{25}{100} = 12.50 \Rightarrow x = \frac{12500}{25} \Rightarrow x = 500 \text{ Rs.}$$

14. (e); Worth of the house = $2800 \times \frac{7}{2} = 9800$ Rs.

15. (e); 35% is = 175 $\Rightarrow 100\% = \frac{175}{35} \times 100 = 500$

Required percentage = $\frac{500}{175} \times 100 = 285.71\%$

16. (d); Let the number is x

$$\frac{50}{100}x - \frac{35}{100}x = 12 \Rightarrow \frac{15x}{100} = 12$$

$$x = \frac{12 \times 100}{15} \Rightarrow x = 80$$

17. (c); Total such numbers = 14

Required percentage = $\frac{14}{70} \times 100 = 20\%$

18. (c); Let the number be x.

$$\frac{75}{100}x + 75 = x \Rightarrow x - \frac{3}{4}x = 75$$

$$\frac{x}{4} = 75 \Rightarrow x = 300$$

19. (d); Let the two numbers be x and y.

$$x + y = 2490 \Rightarrow \frac{65}{1000}x = \frac{85}{1000}y$$

$$x = \frac{17}{13}y \Rightarrow \frac{17}{13}y + y = 2490$$

$$\frac{30y}{13} = 2490 \Rightarrow y = \frac{2490 \times 13}{30}$$

$$y = 1079 \Rightarrow x = 2490 - 1079 \Rightarrow x = 1411$$

20. (b); Let the First and Second number be x and y

$$\frac{x}{12} = \frac{y}{4} \Rightarrow \frac{x}{y} = \frac{3}{1}$$

Required percentage = $\frac{3-1}{1} \times 100 = 200\%$

21. (c); Let the Numbers be x and y.

$$x \times \frac{80}{100} = y \Rightarrow \frac{4x}{5} = y$$

$$\frac{x}{y} = \frac{5}{4} \quad \begin{cases} x = 5k \\ y = 4k \end{cases}$$

$$x^2 + y^2 = 656 \Rightarrow 25k^2 + 16k^2 = 656$$

$$k^2 = \frac{656}{41} \Rightarrow k = 4 \Rightarrow x = 4 \times 5 = 20$$

$$y = 4 \times 4 = 16$$

Numbers are 16 and 20

22. (d); Percentage increase in salary = $\frac{900}{7200} \times 100$

$$= \frac{100}{8} = 12\frac{1}{2}\%$$

23. (d); Let B's salary be = 100, A's salary be = 80

Required percentage = $\frac{20}{80} \times 100 = 25\%$

24. (a); Let the price of petrol be 100

Increase Price = 120

Required percentage = $\frac{120 - 100}{120} \times 100$

$$= \frac{100}{6} = 16\frac{2}{3}\%$$

25. (d); Increase Price = $\frac{110}{100} \times \frac{110}{100} \times 100 = 121$

26. (a); Commission = $15000 \times \frac{25}{200} = \frac{15000}{8} = 1875$ Rs.

27. (d); Increase Monthly income = $5000 \times \frac{130}{100} = 6500$ Rs.

28. (b); New Price of the article = $15000 \times \frac{92}{100}$
 $= 13800$ Rs.

29. (e); Money left = $100\% - 20\% - [100\% - 20\%] \frac{25}{100}\%$
 $= 100\% - 20\% - 20\% = 60\%$

$\therefore 60\% = 480 \Rightarrow 100\% = \frac{480}{60} \times 100 = \text{Rs. } 800$

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30. (d); $\frac{15}{100} \times \frac{10}{100} \times \frac{20}{100} \times 1000 = 3$

31. (b); Let the number will be $\frac{x}{y}$

$$\text{Increased number} = \frac{x + \frac{120}{100}x}{y + \frac{350}{100}y} = \frac{\frac{11}{10}x}{\frac{45}{10}y} \Rightarrow \frac{220x}{450y} \Rightarrow \frac{x}{y} = \frac{11}{27} \times \frac{45}{22}$$

$$\text{Original Fraction} \Rightarrow \frac{x}{y} = \frac{5}{6}$$

32. (c); Let the Numbers be x and y.

$$\frac{40}{100}x = \frac{2}{3}y \Rightarrow \frac{2}{5}x = \frac{2}{3}y$$

$$\frac{x}{y} = \frac{5}{3} \Rightarrow x:y = 5:3$$

33. (b); Run scores from boundaries and sixes
 $= 3 \times 4 + 8 \times 6 = 60$

Required percentage by Running between the

$$\text{wickets} = \frac{110 - 60}{110} \times 100 = \frac{500}{11} = 45\frac{5}{11}\%$$

34. (b); $\frac{50}{100}(x-y) = \frac{30}{100}(x+y)$

$$5x - 5y = 3x + 3y \Rightarrow 2x = 8y \Rightarrow \frac{y}{x} = \frac{1}{4}$$

$$\text{Required Percentage} = \frac{1}{4} \times 100 = 25\%$$

35. (b); Error = $(81.5 - 81.472) = 0.028$

$$\text{Required percentage} = \frac{0.028}{81.472} \times 100 = 0.034\%$$

36. (e); Let the number be x and y

$$x - y = 1600 \Rightarrow \frac{75}{1000}x = \frac{125}{1000}y$$

$$x = \frac{5}{3}y \Rightarrow \frac{5}{3}y - y = 1600$$

$$\frac{2y}{3} = 1600 \Rightarrow y = 2400$$

$$x = 1600 + 2400 = 4000$$

37. (c); Let the number be x

$$\frac{65}{100}x + 21 = \frac{4}{5}x \Rightarrow \frac{4x}{5} - \frac{13x}{20} = 21$$

$$\frac{16x - 13x}{20} = 21 \Rightarrow \frac{3x}{20} = 21 \Rightarrow x = 140$$

38. (c); It means that $0.08\% \text{ of } x = 2$

$$\frac{8}{100 \times 100} \times x = 2 \Rightarrow x = \frac{2 \times 100 \times 100}{8}$$

$$\text{Required Number} = 2500$$

39. (d); Greatest Number = 0.17

40. (c); $\frac{16}{3} \times \frac{2}{100} \times 600 - 33 \frac{1}{3} \times \frac{1}{100} \times 180$

$$\Rightarrow \frac{1}{6} \times 600 - \frac{1}{3} \times 180 = 100 - 60 = 40 \text{ gm}$$

Moderate

1. (b); If Rishu failed by 5% marks which means he got 30% marks.

$$30\% \text{ marks} = 216 \Rightarrow 100\% \text{ marks} = \frac{216}{30} \times 100$$

$$\text{Total marks} = 720$$

2. (d); If the price of petrol has increase by 20%, it has

gone up $\frac{1}{5}$ th of its earlier price.

\therefore The % of reduction in petrol that will maintain

$$\text{the amount of money spent on petrol} = \frac{1}{1+5} = \frac{1}{6}$$

$$= 16.67\% \Rightarrow \text{Reduction in travel} = 16.67\%$$

3. (a); Let the increased breath be x

$$20 + x + \frac{20x}{100} = 50 \quad [\% \text{ increase} = m + n + \frac{mn}{100}]$$

$$x + \frac{x}{5} = 30 \Rightarrow \frac{6x}{5} = 30$$

$$x = \frac{30 \times 5}{6} \Rightarrow x = 25\%$$

4. (b); Let amit's salary be x

$$\text{Aditya salary} = \frac{120}{100} \times 30,000 = 36,000 \text{ Rs.}$$

$$\frac{x \times 80}{100} = 36000 \Rightarrow x = \frac{36000 \times 100}{80} = 45,000 \text{ Rs.}$$

PERCENTAGE

5. (b); The percentage of students fails in both subjects
 $= 100 - [(60 + 45) - 25] = 20\%$

6. (c); Required quantity of arc $= 69 \times \frac{100}{23} = 300$

7. (b); Percentage consumption Reduced $= \frac{4}{30} \times 100$
 $= \frac{40}{3} = 13\frac{1}{3}\%$

8. (c); Let Aditya's salary was 100 Rs.
 Increased salary = 140 Rs.

$$\text{Decreased salary} = 140 \times \frac{75}{100} = 105 \text{ Rs.}$$

Net effect = 105 - 100 = 5% increase

9. (e); Student of 8 years = 48
 Total number of student of age more than 8 years
 $= 48 \times \frac{2}{3} = 32$

Total student of 8 years old or above
 $= 32 + 48 = 80$

Now 20% of student is below 8 years old so 80%
 of student = 80
 So total student = 100

10. (d); Let number is 15

$$\text{Original result} = 15 \times \frac{5}{3} = 25$$

$$\text{Wrong result} = 15 \times \frac{3}{5} = 9$$

$$\text{Percentage error} = \frac{25 - 9}{25} \times 100 = 64\%$$

11. (a); No of valid votes $= 7500 \times \frac{80}{100} = 6000$

$$\text{No. of votes that other candidate got} = 6000 \times \frac{45}{100} = 2700$$

12. (a); Total no of votes $= 1136 + 7636 + 11628 = 20400$

$$\text{required percentage} = \frac{11628}{20400} \times 100 = 57\%$$

13. (a); Rebate $= 6650 \times \frac{6}{100} = 399 \text{ Rs.}$

Amount after Rebate $= 6650 - 399 = \text{Rs. } 6251$

$$\text{Amount paid for the goods} = 6251 \times \frac{110}{100} = 6876.10 \text{ Rs.}$$

14. (b); Percentage increase in decade $= \frac{87500}{175000} \times 100$
 $= 50\%$

\therefore 50% increase in 10 years.
 \therefore Per year % increase = 5%

15. (d); Passing percentage $= 46\% - 15\% = 31\%$

$$\therefore 6\% = 45 \Rightarrow 100\% = \frac{45}{6} \times 100$$

\therefore Total marks = 750

16. (b); Let the initial amount be 100%
 Total amount stolen and gave to friend = 35%
 Remaining amount = 65%

$$\text{Amount spend on party} = \frac{65}{2} = 32.5\%$$

$$32.5\% = 26$$

$$100\% = \frac{26}{32.5} \times 100 \Rightarrow \text{Initial amount} = \text{Rs. } 80$$

17. (c); Let B's salary be 100, A's salary be 120

$$\text{Required percentage} = \frac{20}{120} \times 100 = \frac{100}{6} = 16.67\%$$

18. (d); Let the number be 100, Increased number = 120

$$\text{Decreased number} = 120 \times \frac{80}{100} = 96$$

After this number is decreased by 4%.

19. (d); Let the number be x

$$\therefore \frac{3}{5}x = 23 + \frac{50x}{100} \Rightarrow \frac{3}{5}x - \frac{1}{2}x = 23 \Rightarrow x = 230$$

$$\frac{80}{100} \times 230 = 184$$

20. (a); Let the third number be 100

Second number = 70, First number = 80

$$\text{Required percentage} = \frac{70}{80} \times 100 = 87.5\%$$

21. (c); Let the two numbers be x and y

$$x + y = \frac{23}{20} \text{ of } x \Rightarrow y = \frac{23x}{20} - x \Rightarrow y = \frac{3x}{20}$$

$$\text{Required percentage} = \frac{\frac{3x}{20}}{x} \times 100 = 15\%$$

22. (b); Let the Number = 7

So, correct answer $= 7 \times 7 = 49$

But answer obtained $= \frac{7}{7} = 1$

$$\% \text{ error} = \frac{48}{49} \times 100 = 97.96\%$$

23. (e); Let the total number of children be x then

$$\frac{405}{x} = x \times \frac{20}{100} \Rightarrow \frac{405}{x} = \frac{x}{5} \Rightarrow x^2 = 2025$$

$$x = 45$$

∴ number of toffees each student gets = $\frac{405}{45} = 9$

24. (a); 10% marks = $35 + 15 = 50$, 100% marks = 50×10
 \therefore Total marks = 500

$$\text{Passing marks} = 500 \times \frac{30}{100} + 15 = 165$$

$$\text{Required percentage} = \frac{165}{500} \times 100 = 33\%$$

25. (b); Let the price per kg is 100 rs.
The total money used for 49 kg = 4900 Rs.

$$\text{After Price decrease} = \frac{4900}{98} = 50 \text{ kg}$$

Means 1 kg is the answer.

26. (d); Let Ram's salary is 100
Sanjay's salary is 80 and Aditya's salary is 125
Total of all salary = 305

$$\therefore \text{Sanjay's salary} = \frac{61000}{305} \times 80 = 16000 \text{ Rs.}$$

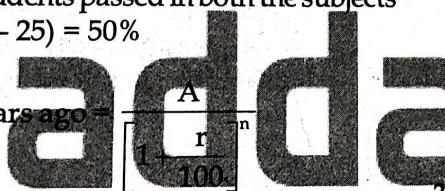
27. (c); let B = 100, then A = 150

$$\text{Required percentage} = \frac{100}{250} \times 100 = 40\%$$

28. (d); Required percentage = $20 + 25 - 7 = 38\%$

29. (d); percentage of students passed in both the subjects
= $100 - (30 + 45 - 25) = 50\%$

30. (a); Population \times years ago =



$$= \frac{1331000}{\left[1 + \frac{10}{100}\right]^3} = \frac{1331000}{\frac{1331}{1000}} = 1000000$$

31. (c); Let C received = 100

\therefore B received = 120

$$\text{A received} = 120 \times \frac{125}{100} = 150$$

$$\text{Amount A received} = \frac{18500}{370} \times 150 = \text{Rs. 7500}$$

32. (d); Let the price of a shirt be 100

25% increase = 125

$$30\% \text{ decrease} = 125 \times \frac{70}{100} = 87.5\%$$

$$\therefore \% \text{ decrease} = 100 - 87.5 = 12.5\%$$

33. (d); Marks of Aditya = $456 - 24 = 432$
 $\therefore 54\% = 432$

$$100\% = \frac{432}{54} \times 100 = 800$$

$$\text{Passing marks} = 800 \times \frac{35}{100} = 280$$

34. (b); Total no of boy and girl appeared in the examination = $1200 + 650 = 1850$

$$\text{No. of boy passed} = 1200 \times \frac{30}{100} = 360$$

$$\text{No. of girl passed} = 650 \times \frac{60}{100} = 390$$

Total no. of boys and girls passed = 750

$$\text{Required \%} = \frac{750}{1850} \times 100 = 40.54\% \approx 41\%$$

$$35. (c); \text{Sanjay's monthly salary} = \frac{17250}{115} \times 100 \\ = \text{Rs. 15000}$$

$$\text{Sanjay's Annual salary} = 15000 \times 12 \\ = \text{Rs. 180000}$$

36. (e); Population at the end of 2 years.

$$55000 \times \frac{112}{100} \times \frac{85}{100} = 52360$$

37. (d); Impact on area

$$= 20 + (-10) + \frac{20 \times (-10)}{100} \quad \begin{bmatrix} \text{Using formula} \\ m+n+\frac{mn}{100} \end{bmatrix} \\ = -10 - 2 = 8\% \text{ increased}$$

38. (e); Impact on perimeter can't be determined as changes in different length and breadth give different net effect on perimeter

39. (c); Let Sanjay gets 100 marks
 \therefore Girish gets 120 marks

$$\therefore \text{Ram gets} = 120 \times \frac{120}{100} = 144 \text{ marks}$$

$$\text{Sanjay marks} = \frac{576}{144} \times 100 = 400$$

$$\text{Aditya marks} = \frac{400 \times 100}{80} = 500 \text{ marks}$$

40. (e); Let the numbers be x and y
So product = xy

$$\text{given, } \frac{1}{3}x \times \frac{150y}{100} \Rightarrow \frac{1}{3}x \times \frac{3y}{2} \Rightarrow \frac{xy}{2}$$

$$\text{Required percentage} = \frac{\frac{xy}{2}}{xy} \times 100 = 50\%$$

PERCENTAGE**Difficult**

1. (a); $43.5 = \frac{725 \times R \times 1}{100} + \frac{362.5 \times 4 \times 2R}{12 \times 100}$

$$43.5 \times 300 = 2175R + 362.5 \times 2R = 2900R$$

$$R = 4.5$$

2. (b); Total debt $= 22500 \times \frac{100}{85} = \text{Rs. } 30000$

Money received by selling the goods

$$= 25500 \left(\frac{2}{5} \times \frac{83}{100} + \frac{3}{5} \times \frac{78}{100} \right) = \frac{25500}{500} (166 + 234)$$

$$= 51 \times 400 = \text{Rs. } 20400$$

Therefore, money received by the creditors for a rupee $= \text{Rs. } \left(\frac{20400}{30000} \right) = \text{Rs. } 0.68 = 68 \text{ paise}$

Hence, the creditor received 68 paise in a rupee.

3. (a); 10% of 2000 = 200

Selling price of 200 tables at 50%

$$= \text{Rs. } \left(200 \times \frac{1725}{2} \right) = \text{Rs. } 172500$$

Selling price of remaining 1800 tables

$$= \text{Rs. } (1800 \times 1725) = \text{Rs. } 3105000$$

Total revenue from selling 2000 tables

$$= \text{Rs. } (172500 + 3105000) = \text{Rs. } 3277500$$

Now, Rs. 3277500 includes 15% profit. Therefore,

$$\text{cost price of 2000 tables} = \frac{100}{115} \times 3277500$$

$$= \text{Rs. } 2850000$$

Now the actual selling price

$$= 2000 \times \frac{30}{100} \times 1725 + 2000 \times \frac{70}{100} \times \frac{1725}{2}$$

$$= 2000 \times 1725 \left(\frac{30}{100} + \frac{35}{100} \right)$$

$$= 20 \times 1725 \times 65 = \text{Rs. } 2242500$$

\therefore Loss = Cost Price - Selling Price

Hence, the Shopkeeper incurs a loss of
= Rs. 607500.

4. (b); The first year's increase of 10% can be expressed as 1.10; the second year's increase of 5% can be expressed as 1.05; and the third year's decrease of 10% can be expressed as 0.90. Now, multiply

the original value of the investment account by each of these yearly changes.
 $10000 \times 1.10 \times 1.05 \times 0.90 = 10395 \text{ Rs.}$
Hence, the value of the investment today is
= Rs. 10,395.

5. (a); Let y be the number of registered voters in Mumbai. Then, the information that 60% of the registered voters are from BJP can be expressed as $0.60y$. From this, it can be stated that $1.00y - 0.60y = 0.40y$ are from Congress. The percentage of BJP-supporters and the percentage of Congress-supporters who are expected to vote for candidate X can then be expressed as:

$$0.75 \times 0.60y + 0.20 \times 0.40y$$

Simplify the expression to determine the total percentage of voters expected to vote for candidate X = $0.75 \times 0.60y + 0.20 \times 0.40y$

$$= 0.45y + 0.08y = 0.53y$$

Hence, 53% of the registered voters are expected to vote for candidate X.

6. (d); The ratio of royalties to sales for the first Rs. 20 million in sales is $\frac{3}{20}$, and the ratio of royalties to sales for the next Rs. 108 million in sales is $\frac{9}{108} = \frac{1}{12}$. The percent decrease in the royalties to sales ratios is 100 times the quotient of the difference in the ratios divided by the ratio of royalties to sales for the first Rs. 20 million in sales, i.e.,

$$\frac{\frac{1}{12} - \frac{3}{20}}{\frac{3}{20}} \times 100 = \left(\frac{1}{12} - \frac{3}{20} \right) \times \frac{20}{3} \times 100$$

$$= \left(\frac{5-9}{60} \right) \times \frac{20}{3} \times 100 = \frac{-4}{60} \times \frac{20}{3} \times 100 = \frac{-4}{9} \times 100$$

$$= -0.4444 \times 100 = -44.44 = 44.44\% \text{ decrease}$$

7. (a); Let the population of the city be 100. Then,
People reading Dainik Jagran = 25
People reading Prabhat Khabar = 20
People reading both = 8
People reading only Dainik Jagran = 17
People reading only Prabhat Khabar = 12
Therefore, required percentage of people who read an advertisement

$$= \left(\frac{17}{100} + \frac{12}{100} + \frac{8}{100} \right) = 13.9\%$$

8. (b); Let the number of people in my office = 100
 At least 50 people read an e-newspaper.
 At most 12.5 people read more than one e-newspaper.
 Therefore, at least 37.5 people read only one e-newspaper.
 Hence, at least 37.5% read exactly one e-newspaper.

9. (d); Let the total number of students by y . Then,

$$\text{Number of boys} = \frac{3y}{5}, \text{ Number of girls} = \frac{2y}{5}$$

$$\text{Number of girls scoring more than 40 marks} \\ = \frac{4}{5} \times \frac{2y}{5} = \frac{8y}{25}$$

$$\text{Total number of students scoring more than 40 marks} \\ = \frac{3y}{5}$$

$$\therefore \text{Required fraction} = \frac{7}{25} \times \frac{5}{3} = \frac{7}{15}$$

Hence, the fraction of the boys who scored 40 marks or less is $\frac{7}{15}$.

10. (a); Let the total number of respondents = 100
 People favoured IAC = 60

People favoured IPP = 40

New no. of people facouring IAC = 58

New no. of people favouring IPP = 42

Required percentage = 14%

11. (a); Total characters in the report = $25 \times 60 \times 75$

Let the new number of pages be n . Then,

$$n \times 55 \times 90 = 25 \times 60 \times 75$$

$$\therefore n = \frac{25 \times 60 \times 75}{55 \times 90} = 22.72 \approx 23$$

This means that Suman would need 23 pages for writing his report, which is a drop of 8% in terms of the pages.

12. (b); Income of the sales representative

$$= 1200 + 1600 \times y$$

Where y is the number of Rs. 10000 sales he achieves over the initial Rs. 10000.

Therefore,

$$1200 + 1600 \times y = 7600$$

$$\text{Or, } y = \frac{(7600 - 1200)}{1600} \Rightarrow \text{Or, } y = \frac{6400}{1600} = 4$$

Thus, the total sales value must be Rs. 50000.

13. (c); At 12 noon, the watch would show the correct time, because till then the temperature range is below 40°C. The watch would gain 2% every hour between 12 noon and 4 p.m. An hour having 3600 seconds, it would gain 72 seconds in each of these hours. Thus, at 7 p.m. the watch would be $72 \times 4 = 288$ seconds ahead. The time exhibited by the watch would be 7 : 04 : 48 p.m.

14. (a); For last year; Lenovo = 100, Apple = 110
 For this year; Lenovo = 120, Apple = 132
 Samsung = 26.4
 Last year, Samsung = 68.4

$$\text{Required percentage} = \frac{68.4}{278.4} \times 100 = 25\%$$

Hence, last year the sales of Samsung laptops were 25% of the total market for the laptops.

15. (b); Let solutions = 100 ml and therefore, alcohol = 40 ml.

$$\text{For first jar; } \frac{40+y}{100+y} = \frac{1}{2}$$

$$\therefore 80 + 2y = 100 + y \Rightarrow y = 100 - 80 = 20 \text{ ml}$$

$$\text{For second jar; } \frac{40 - \frac{2}{5}y + y}{60 - \frac{3}{5}y} = \frac{1}{1}, y = \frac{100}{6}$$

Hence, required percentage

$$= \frac{20 - \frac{100}{6}}{\frac{100}{6}} \times 100 = 20\%$$

16. (c); Let the total number of students appeared for the test be y . Then,

$$\text{The number of male students appeared} = \frac{9y}{10}$$

$$\text{And the number of female students} = \frac{y}{10}$$

$$\text{Now, according to question} = \frac{3}{5} \times \frac{9y}{10} + \frac{4}{5} \times \frac{y}{10} \\ = 1240$$

$$\frac{27y + 4y}{50} = 1240 \Rightarrow 31y = 1240 \times 50 = 62000$$

$$\therefore y = \frac{62000}{31} = 2000$$

Hence, the total number of candidates who appeared for the test is 2000.

PERCENTAGE

17. (d); The best way of solving this question is through the method of elimination, i.e., going through the options.

Obviously, options (A), (B) and (C) cannot be the answer, because if 500 or more than 500 people are voting in against the resolution, then the motion cannot be passed.

Now, let us check the option (D). If 400 people are voting against the resolution for the first time, then 500 are voting in favour. Now, in the second voting, persons voting against the resolution would be 600, so persons voting in favour = 200.

In the first voting, resolution was passed by 100 votes and in the second voting, resolution was defeated by 400 votes. And it is 300% more than 100.

18. (a); Let the value of index = 100

Value of Vision Power share = 7

Value of Vision Infra = 13

Value of Vision Communication = 15

Value of remaining = 65

New value of Vision Power = 7.63

New value of Vision Infra = 14.3

New value of Vision Communication = 15.6

New value of remaining = 68.47

$$\text{Hence, required percentage} = \frac{68.47 - 65}{65} \times 100$$

$$= \frac{3.47}{65} \times 100 = 5.34\%$$

Hence, the price of other shares have increased by 5.34%

19. (b); Let x be A's profit and y be B's profit. Then,

$$x + 2520 = x \left(1 + \frac{10}{100}\right)^2$$

$$\Rightarrow x + 2520 = x \times \frac{121}{100}$$

$$100x + 252000 = 121x \Rightarrow 121x - 100x = 252000$$

$$\therefore x = \frac{252000}{21} = 12000$$

$$\text{Also, } 4200 = \frac{y \times 20 \times 1}{100}$$

$$20y = 4200 \times 100$$

$$\therefore y = \frac{420000}{20} = 21000$$

C's profit = Rs. 9000

Ratio of their profit = 12000 : 21000 : 9000

= 12 : 21 : 9 = 4 : 7 : 3

$$\text{Therefore, C's share} = \frac{3}{14} \times 70000 = 3 \times 5000$$

= Rs. 15000

20. (d); Total money spent in buying goods = Rs. 63000

Total money kept in the bank = Rs. 27000

Total money received after selling the goods = Rs. 50400

Total money received from bank after 2 years = Rs. 35707.5

Therefore,

$$\text{Loss} = \text{Rs. } 90000 - \text{Rs. } (50400 + 35707.5)$$

$$= \text{Rs. } 90000 - \text{Rs. } 86107.5 = \text{Rs. } 3892.5$$

$$\text{Hence, percentage loss} = \frac{3892.5}{90000} \times 100 = 4.325\%$$

Hence, the total assets Sashi decreases by 4.325%

Previous Year (Memory Based)

1. (a); $\frac{40}{100} \times \frac{50}{100} \times \frac{3}{4} \times 3200 = 480$

2. (c); Let the number be x

$$\frac{1}{5}x = 62 \Rightarrow x = 310$$

$$73\% \text{ of } x = 310 \times \frac{73}{100} = 226.3$$

3. (a); Let the number be x

$$\frac{2}{3} \times \frac{3}{4} \times \frac{1}{5} \times x = 15 \Rightarrow x = 150$$

$$30\% \text{ of } x = 150 \times \frac{30}{100} = 45$$

4. (e); Let the number be x

$$\frac{3}{4} \times \frac{2}{3} \times \frac{1}{5} \times x = 249.6 \Rightarrow x = \frac{249.6 \times 4 \times 3 \times 5}{3 \times 2}$$

$$x = 2496 \Rightarrow 50\% \text{ of } x = \frac{2496}{2}$$

Total amount = 1248

5. (c); Ishan's total spent on bike and television = 35645 + 24355 = Rs. 60000

$$\therefore 80\% = \text{Rs. } 60,000$$

$$100\% = \frac{60,000}{80} \times 100 = \text{Rs. } 75000$$

6. (b); Sonal's total spent = $45760 + 27896 = \text{Rs. } 73656$
 $\therefore 72\% = \text{Rs. } 73656$

$$100\% = \frac{73656}{72} \times 100 = \text{Rs. } 102300$$

7. (b); Rajesh's total spent = $44620 + 32764 = 77384$
 $\therefore 68\% = 77384$

$$100\% = \frac{77384}{68} \times 100 \text{ Rs. } = 113800$$

8. (d); Harjeet total monthly expenditure = $50 + 20 + 5 = 75\%$
 $\therefore 25\% = 11250 \Rightarrow 100\% = \frac{11250}{25} \times 100 = 45000$

Harjeet total monthly income = 45000

9. (b); Mr. Giridhar's total expenditure

$$= 50\% + 50 \times \frac{(50+25+10)}{100}\% = 50\% + 50 \times \frac{85}{100}\%$$

$$= 50 + 42.5\% = 92.5\%$$

$$\text{Saving} = 100 - 92.5\% = 7.5\% \Rightarrow 7.5\% = 900$$

$$100\% = \frac{900}{7.5} \times 100 = 12000$$

10. (a); Shruti's donation = $(12 \times \frac{75}{100})\% = 9\%$

$$\therefore 9\% = 3150 \Rightarrow 100\% = \frac{3150}{9} \times 100 = 35,000$$

11. (a); Asha's monthly income = $78000 \times \frac{60}{100} = \text{Rs. } 46800$

$$\text{Maya's monthly income} = \frac{46800 \times 100}{120}$$

$$= \text{Rs. } 39000$$

12. (c); Let the share of B be x Rs.

According to the question

$$\therefore \text{share of C} = x \left(\frac{100-25}{100} \right) = \frac{3}{4}x$$

$$\text{share of A} = \frac{3}{4}x \left(\frac{125}{100} \right) = \frac{3}{4}x \times \frac{5}{4} = \frac{15}{16}x$$

$$\therefore \frac{15}{16}x + x + \frac{3}{4}x = 2236$$

$$\frac{15x + 16x + 12x}{16} = 2236 \Rightarrow x = \frac{2236 \times 16}{43} = 832$$

$$\therefore \text{Share of A} = \frac{15}{16} \times 832 = 780 \text{ Rs}$$

13. (c); Pooja's total investment = $13 + 23 + 8 = 44\%$
 $\therefore 13\% = 8554$

$$\text{Then } 44\% = \frac{8554}{13} \times 44 = \text{Rs. } 28952$$

14. (b); Total investment by Mr Sanang = $(6 + 8 + 9)\% = 23\%$

$$\therefore 6\% = 2100 \Rightarrow 23\% = \frac{2100}{6} \times 23 = 8050$$

$$\therefore \text{Annual investment by Mr. Sanang} = 8050 \times 12 = 96600$$

15. (d); Total investment by Mr. Jain = $(14 + 21 + 6.5)\% = 41.5\%$

$$\therefore 14\% = 7014 \Rightarrow 41.5\% = \frac{7014}{14} \times 41.5 = 20791.5$$

$$\therefore \text{Annual investment by Mr. Jain} = 20791.5 \times 12 = 249498$$

16. (d); Abhinav invested Rs 6000.

$$\text{Sunil's investment} = 6000 \times \frac{70}{100} = 4200$$

$$\text{Rita's investment} = 4200 \times \frac{125}{100} = 1050 \times 5 = 5250$$

$$\text{Total investment} = 6000 + 4200 + 5250 = 15450$$

$$\text{Required ratio} = \frac{5250}{15450} = 35 : 103$$

17. (a); Deepa's total investment = $(11 + 19 + 7)\% = 37\%$

$$\therefore 11\% = 5236 \Rightarrow 37\% = \frac{5236}{11} \times 37 = \text{Rs. } 17612$$

$$\text{Total Annual investment by Depti} = 17612 \times 12 = \text{Rs. } 211344$$

18. (e); Sweets that each student got = $80 \times \frac{15}{100} = 12$

$$\text{Total no of sweets} = 80 \times 12 = 960$$

19. (d); Sweets that each student got = $50 \times \frac{12}{100} = 6$

$$\text{Sweets that each teacher got} = 50 \times \frac{20}{100} = 10$$

$$\text{Total no. of sweets} = 50 \times 6 + 5 \times 10 = 350$$

20. (d); Sweets that each student got = $80 \times \frac{15}{100} = 12$

$$\text{Sweets that each teacher got} = 80 \times \frac{25}{100} = 20$$

$$\text{Total no of sweets} = 80 \times 12 + 5 \times 20 = 1060$$

PERCENTAGE

21. (c); Total marks to pass = $40 + 30 = 70$

$$35\% \text{ of marks} = 70 \Rightarrow 100\% = \frac{70}{35} \times 100 = 200$$

∴ Maximum marks of test = 200

22. (b); Seema got marks in percentage = $100 - 76 = 24\%$

$$24\% \text{ of marks} = 480 \Rightarrow 100\% = \frac{480}{24} \times 100 = 2000$$

∴ Marks got by Raja = $2000 - 480 = 1520$

23. (a); Total correct answer required = $150 \times \frac{60}{100} = 90$

$$\text{Correct answer from first 75 question} = 75 \times \frac{40}{100} = 30$$

$$\begin{aligned}\text{Required percentage} &= \frac{90 - 30}{75} \times 100 \\ &= \frac{60}{75} \times 100 = 80\%\end{aligned}$$

24. (c); Total valid voter = $8400 \times \frac{75}{100} = 6300$

$$\begin{aligned}\text{No. of valid votes other person got} &= 6300 \times \frac{48}{100} \\ &= 3024\end{aligned}$$

25. (d); Total no of valid voter = $15200 \times \frac{85}{100} = 12920$

$$\begin{aligned}\text{No. of valid votes other person got} &= \\ &= 12920 \times \frac{45}{100} = 5814\end{aligned}$$

26. (e); Population of the town at the end of second year

$$= 48600 \times \frac{125}{100} \times \frac{92}{100} = 55890$$

27. (e); Weight of water in 60 gm mixtime = $60 \times \frac{75}{100}$

$$= 45 \text{ gm}$$

Total weight of water = $45 + 15 = 60 \text{ gm}$

$$\text{Required percentage} = \frac{60}{75} \times 100 = 80\%$$

28. (b); Let the No is 100;

First increase = 110

$$\text{Second increase} = 110 \times \frac{120}{100} = 132$$

$$\text{Third increase} = 132 \times \frac{125}{100} = 165$$

Single equivalent increase = 65%

29. (b); Required percentage = $\left(\frac{x}{100+x} \times 100 \right)$

[∴ Where x is % increase]

$$= \frac{20}{120} \times 100 = 16\frac{2}{3}\%$$

30. (e); Let the marked price of the article be x Rs.

Selling price at a discount of 20%

$$= x - \frac{20x}{100} = \frac{4x}{5} \text{ Rs.}$$

In order to give 60% on market price, selling price

$$= x \left(\frac{100 + 60}{100} \right) = \frac{8x}{5} \text{ Rs.}$$

$$\therefore \text{Required percent} = \frac{\frac{8x}{5} - \frac{4x}{5}}{\frac{4x}{5}} \times 100 = 100\%$$

31. (c); Let maximum marks be x.

According to the question

$$10\% \text{ of } x = 256 - 192 \Rightarrow \frac{10}{100} x = 64 \Rightarrow x = 640$$

32. (c); Let the total votes = 100 x.

Given, Total votes cast = 60x

$$\text{Total valid votes} = 60x - \frac{60 \times 4}{100} = 57.6x$$

According to the question

$$57.6x \times \frac{75}{100} = 7344 \Rightarrow x = 170$$

$$\therefore \text{Total votes} = 100x = 170 \times 100 = 17000$$

33. (e); Total % of money left = $100 - (52 + 23)\% = 25\%$

$$\therefore 25\% = 4500$$

$$100\% = \frac{4500 \times 100}{25} = \text{Rs. 18000}$$

34. (c); No. of students speak only Hindi

$$= 60 \times \frac{40}{100} = 24$$

No. of students speak only English

$$= 60 \times \frac{25}{100} = 15$$

No. of students speak both languages

$$= 60 - (24 + 15) = 21$$

$$\text{No. of students speak English} = 15 + 21 = 36$$

PERCENTAGE

35. (d); In this question profit is not given.
 \therefore The answer is cannot be determined

36. (a); $10\% = 1950 \Rightarrow 15\% = \frac{1950}{10} \times 15 = 2925$

37. (b); % drop $= \frac{5.5 - 4.4}{5.5} \times 100 = \frac{1.1}{5.5} \times 100$
 $= 20\%$ decrease

38. (a); Net effect $= -25 + 30 - \frac{25 \times 30}{100} = 2\frac{1}{2}\%$ decrease

39. (d); Let the income of the man be 100 Rs.
Expenditure = 75 and saving = 25
Then, from the question new income = 120

QUANTITATIVE APTITUDE

and expenditure $= 75 \times \frac{110}{100} = 82.50$

Saving $= 120 - 82.50 = 37.50$

% increase in the saving $= \frac{37.50 - 25}{25} \times 100 = 50\%$

40. (c); Percentage of votes not fetched by the elected candidate $= 100 - 63 = 37\%$

$\therefore 37\% = 54982$

$\therefore 100\% = \frac{54982}{37} \times 100$

Required votes = 148600 votes

