

# PERCENTAGES



- Percentage means per one hundred.
- $X\%$  means  $X / 100$
- **$10\%$  means  $10 / 100$  , which is  $1 / 10$ .**

- 10% increase means  $\frac{110}{100} \rightarrow \frac{11}{10}$
- 10% decrease means  $\frac{90}{100} \rightarrow \frac{9}{10}$

- To convert a ratio into percentage multiply it with 100.
- Eg:  $1 / 2$  (ratio) into percentage(%)  $\rightarrow (1 / 2) * 100 = 50\%$
- **$10\%$  of (50) is same as  $50\%$  of (10) . Ans 5**

- ❖ If A is  $R\%$  more than B, then B is less than A by  
(or)
- ❖ If price of a product increases by  $R\%$  ,then Percentage of consumption to decrease to make no change in expenditure.

$$\left[ \frac{R}{(100+R)} \times 100 \right] \%$$

- ❖ **If A is R % less than B, then B is more than A by**  
**( or )**
- ❖ **If price of a product decreases by R% ,then the Percentage of consumption to increase to make no change in expenditure.**

$$\left[ \frac{R}{(100-R)} \times 100 \right] \%$$

- ❖ **If Population(P) increases by R% per annum, then the Population after 'N' years will be**

**(or)**

- ❖ **If price of an item increases by R% per annum, then the price of an item after 'N' years will be**

$$P \times \left[ \frac{100+R}{100} \right]^N$$

- ❖ **If population(P) increases by R% per annum, then the Population before 'N' years will be**

**(or)**

- ❖ **If price of an item (P) increases by R% per annum, then the price of an item before 'N' years will be**

$$\frac{P}{\left[ \frac{100+R}{100} \right]^N}$$

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- ❖ **If Population(P) decreases by R% per annum, then the Population after 'N' years will be**

**(or)**

- ❖ **If price of an item decreases by R% per annum, then the price of an item after 'N' years will be**

$$P \times \left[ \frac{100-R}{100} \right]^N$$

- ❖ **If population(P) decreases by R% per annum, then the Population before 'N' years will be**

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$$\frac{P}{\left[ \frac{100-R}{100} \right]^N}$$

### Basic Problems:

- 1)
- Let the cost price of an item is 500, if seller increased it by 10% and sell it then what is the selling price. **Ans: 550**
  - Let the cost price of an item is 800, if seller sold it at a loss 25% then what is the selling price. **Ans: 600**
  - Let the cost price of an item is 1100, if seller sold it at a profit of 9.09% then what is the selling price. **Ans: 1200**
- 2) In a family, there are four brothers named A, B, C, and D. Initially, brother A has 500 rupees.
- A increases this amount by 20% and then gives the entire amount to B.
  - B decreases the amount received by 25% and gives the remaining amount to C.
  - C decreases the amount received by 11.11% and gives the remaining amount to D.
  - What is the difference between the initial amount that A had and the final amount that D received ?
- a) 200                      b) 100                      c) 500                      d) 350
- 3) A fruit seller had some oranges, he sells 40% of them and he still got 420 oranges. How many oranges he had earlier ?
- a) 500                      b) 600                      c) 700                      d) 640

### Model : 1

- 1) The salary of a person was reduced by 10%. By what percent should his reduced salary be raised so as to bring it at par with his original salary ?
- a) 10 %                      b)  $16 \frac{2}{3}$  %                      c)  $11 \frac{1}{9}$  %                      d) 20 %
- 2) The salary of a person was Increased by 20% . By what percent should his increased salary be reduced so as to bring it at par with his original salary ?
- a)  $33 \frac{1}{3}$  %                      b)  $16 \frac{2}{3}$  %                      c) 20 %                      d) 10%

- 3) If A earns 33  $\frac{1}{3}$ % more than B, then by how much percent does B earn less than A ?
- a) 20 %      b) 25 %      c) 42 %      d) 16 %
- 4) A's salary is 20% less than B's salary, by how much percent is B's salary more than A ?
- a) 25%      b) 20%      c) 12%      d) 6.55 %
- 5) In the new budget, the price of **Petrol** is increased by 25%. By how much percent must a person reduce his consumption so that his expenditure on it does not increase ?
- a) 20%      b) 25%      c) 30%      d) 42%
- 6) If the price of **tomatoes** drops by 15% due to deflation, by what percentage must a person increase his consumption so that his expenditure on tomatoes does not change ?
- a) 25.36%      b) 12.68%      c) 17.64%      d) 35.22%

**Model: 2**

- 1) The population of a town is 1,76,400. If it increases at the rate of 5% per annum,
- (i) what will be its population 2 years hence ? **ans: 1,94,481**
- (ii) What was it '2' years ago ? **ans : 1,60,000**
- 2) If the population of a town is increased by 20% in the first year and is again increased by 20% in the new year, what effect can be seen in the population of that town (in percentage) ?
- a) 36%      b) 44%      c) 50%      d) 75%

- 3) The value of a machine 'depreciates at the rate of 10% per annum. If its present value is Rs. 162,000.
- (i) what will be its worth after 2 years ? **ans: 1,31,220**  
(ii) What was the value of the machine 2 years ago ? **ans: 2,00000**
- 4) The value of a machine depreciates at the rate of 20% every year. It was purchased 3 years ago. If its present value is Rs.6400, its purchase price was.
- a) 15200      b) 10000      c) 17500      d) 12500
- 5) If the side of the square is increased by 30% then its area is increased by (in%) ?
- a) 5% ↑      b) 30% ↑      c) 69% ↑      d) 58% ↑
- 6) If the length of rectangle is increased by 20% and breadth is decreased by 10% then what will be the impact on area?
- a) 5% ↑      b) 10% ↑      c) 20% ↓      d) 8% ↑

**Model: 3**

- 1) 40% of the greater number is equal to 60% of the smaller. If their sum is 250, then the smaller number is ?
- a) 150      b) 100      c) 120      d) 200
- 2) The sum of 15% of a positive number and 20% of the same number is 126. What is one-third of that number ?
- a) 150      b) 126      c) 120      d) 380

- 3) The product of one-third of a number and 150% of the another number is what percent of the product of the original numbers ?
- a) 50%                      b) 20%                      c) 70%                      d) 35%
- 4) If the numerator of certain fraction is increased by 200% and the denominator is increased by 150% the new fraction thus formed is  $\frac{9}{10}$  . What is the original fraction ?
- a)  $\frac{2}{3}$                       b)  $\frac{3}{4}$                       c)  $\frac{7}{9}$                       d)  $\frac{6}{5}$
- 5) A person multiplied a number by  $\frac{3}{5}$  instead of  $\frac{5}{3}$ , what is the percentage error in calculation ?
- a) 56%                      b) 32%                      c) 64%                      d) 77%
- 6) A person gave 20% of his income to his elder son, 30% of the remaining to the younger son, and 10% of the balance he donated to a trust . He is left with Rs.10080. His income in rupees was ?
- a) 20,000                      b) 30,000                      c) 28,960                      d) 42,000
- 7) A man spends 75% of his income. His income increases by 25% and increased his expenditure by 20%. His savings are increased by what percentage ?
- a) 15%                      b) 40%                      c) 20%                      d) 35%
- 8) A man saves a certain part of his monthly income so that he can purchase a car in 16 months. Find the % increase in his saving , so that he can purchase the same car in 14 months only ?
- a) 24.23%                      b) 14.28%                      c) 34.78%                      d) 12.29%**

- 9) Fresh watermelon contains 80% water while dry watermelon contains 10% water by weights. What is the weight of dry watermelon from 25 kg fresh watermelon ?
- a) 7.5 kg      b) 5.55 kg      c) 3.5 kg      d) 18.5 kg
- 10) In measuring sides of a square an error of 5% excess is made, Find the error % in its area.
- a) 10.25%      b) 15.78%      c) 25.46%      d) 33.33%
- 11) Milk contains 5% water What quantity of pure milk should be added to 10 liters of milk to reduce this to 2%.
- a) 15 liters      b) 5 liters      c) 7 liters      d) 11 liters
- 12) In a school with 4000 students, if 60 percent of the boys and 80 percent of the girls pass the exam, and the overall pass percentage is 65 percent, how many girls are there in the school ?
- a) 1500      b) 1000      c) 2000      d) 3000