Arithmetic

$\frac{1}{2} = 50\%$, $\frac{1}{3} = 33\frac{1}{3}\%$, $\frac{1}{4} = 25\%$, $\frac{1}{5} = 20\%$, $\frac{1}{6} = 16\frac{2}{3}\%$

$\frac{1}{7} = 14\frac{2}{7}\%$, $\frac{1}{8} = 12\frac{1}{2}\%$, $\frac{1}{9} = 11\frac{1}{9}\%$, $\frac{1}{10} = 10\%$, $\frac{1}{11} = 9\frac{1}{11}\%$

unit fraction

$\frac{n}{d}$: $d > n \rightarrow$ proper

$d < n \rightarrow$ improper $\rightarrow Z\frac{n}{d}$ (mixed)

$Z + \frac{n}{d}$

% change

$\frac{\text{change}}{\text{original}} \times 100\% \rightarrow \frac{\text{new} - \text{original}}{\text{original}} \times 100\%$

$= \left(\frac{\text{new}}{\text{original}} - 1\right) \times 100\%$

25% of $x = x/4$

$x - x/4 = \frac{3x}{4}$

$\left(1 - \frac{1}{4}\right)x$

1. In a public library there are 110,000 books, 40% of which are science books. It was decided to add 20,000 new books to the library. How many of the new books should be science books in order to bring the percentage of science books in the library up to 45%?
(a) 15000 (b) 1500 (c) 1450 (d) 14500

science = 44000

$\rightarrow \frac{45}{100} \times 130000$

Target = 58500

2. 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%

T = 110 runs

B&S = 3×4 + 8×6 = 60 runs

Singles = 50 runs

3. A student secures 90%, 60% and 54% marks in test papers with 100, 150 and 200 respectively as maximum marks. The percentage of his aggregate is:
(a) 64 (b) 68
(c) 70 (d) None of these

$\frac{90 + 90 + 108}{450} \times 100\% = \frac{288}{450} \times 100\% =$

15. A number is increased by 10% and then reduced by 10%. After these operations, the number:
(a) does not change (b) decreases by 1%
(c) increases by 1% (d) increases by 0.1%

1st case = 110

2nd case = 99

decrease → $\frac{x^2}{100}\%$

16. The difference between the value of a number increased by 25% and the value of the original number decreased by 30% is 22. What is the original number ?
(a) 70 (b) 65
(c) 40 (d) 90

$\left(1 + \frac{1}{4}\right)x - \left(1 - \frac{3}{10}\right)x = 22$

17. A salesman is allowed $5\frac{1}{2}\%$ discount on the total sales made by him plus a bonus of $\frac{1}{2}\%$ on the sales over ₹ 10,000. If his total earnings were ₹ 1990, then his total sales (in ₹) were:
(a) 30,000 (b) 32,000
(c) 34,000 (d) 35,000

18. If 12% of 75% is greater than 5% of a number by 75, the number is
(a) 1875 (b) 1890
(c) 1845 (d) 1860

28. In a class, 65% of the students are boys. On a particular day 80% of girl students were present. What was the fraction of boys who were present that day if the total number of students present that day was 70%?

(a) $\frac{2}{3}$ (b) $\frac{28}{65}$

(c) $\frac{5}{6}$ (d) $\frac{42}{65}$

29. A's income is 60% of B's income, and A's expenditure is 70% of B's expenditure. If A's income is 75% of B's expenditure, find the ratio of A's saving to B's saving.

(a) 5 : 1 (b) 1 : 5

(c) 3.5 : 1 (d) 2 : 7

30. Due to fall in manpower, the production in a factory decreases by 25%. By what per cent should the working hour be increased to restore the original production?

(a) $33\frac{1}{3}\%$ (b) 20%

(c) 25% (d) 4%

31. A number is increased by 20% and then again by 20%. By what percent should the increased number be reduced so as to get back the original number ?

(a) $19\frac{11}{31}\%$ (b) $30\frac{5}{9}\%$

(c) 40% (d) 44%

32. In the month of January, the Railway Police caught 4000 ticketless travellers. In February, the number rose by 5%. However, due to constant vigil by the Police and the total number of ticketless travellers caught in the month of April was :

(a) 3125 (b) 3255

(c) 3575 (d) 3591

41. Two vessels contain equal quantities of 40% alcohol. Anil changed the concentration of the first vessels to 50% by adding extra quantity of pure alcolol. Balu changed the concentration of the second vessels to 50% replacing a certain quantity of the solution with pure alcohol. By what percentage is the quantity of alcohol added by Anil more than that replaced by Balu?

(a) 20% (b) 25%

(c) 40% (d) Cannot be determined

42. Lagaan is levied on the 60% of the cultivated land. The revenue department collected total ₹ 3,84,4000 through the lagaan from the village of Sukhiya. Sukhiya, a very rich farmer, paid only ₹ 480 as lagaan. The percentage of total land of Sukhiya over the total taxable land of the village is:

(a) 0.15% (b) 15%

(c) 0.125% (d) None of these

43. In an election between 2 candidates, Bhiku gets 65% of the total valid votes. If the total votes were 6000, what is the number of valid votes that the other candidate Mhatre gets if 25% of the total votes were declared invalid?

(a) 1625 (b) 1575

(c) 1675 (d) 1525

44. A machine depreciates in value each year at the rate of 10% of its previous value. However, every second year there is some maintenance work so that in that particular year, depreciation is only 5% of its previous value. If at the end of the fourth year, the value of the machine stands at ₹ 1, 46, 205, then find the value of machine at the start of the first year.

(a) ₹ 1, 90, 000 (b) ₹ 2, 00, 000

(c) ₹ 1, 95, 000 (d) ₹ 2, 10, 000