

Percentage – SSC CGL

Percentage is a key arithmetic topic with direct applications in profit-loss, discount, simple interest, data interpretation, and more.

◆ 1. What is Percentage?

A percentage is a fraction with denominator 100.

$$x\% = (x/100)$$

For example:

- 20% of 150 = $(20/100) \times 150 = 30$
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💡 Important Concepts & Short Tricks

✓ 1. Basic Formulas

- $x\% \text{ of } y = (x \times y)/100$
 - Increase by $x\% = \text{Multiply by } (1 + x/100)$
 - Decrease by $x\% = \text{Multiply by } (1 - x/100)$
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✓ 2. Percentage Change

- % Increase/Decrease =


$$\frac{\text{Change}}{\text{Original Value}} \times 100$$

✓ 3. Net Percentage Change (Successive Changes)

If a value increases by $a\%$ and then by $b\%$,

Net % change =

$$a + b + \frac{ab}{100}$$

 Works for any successive % changes (increase or decrease)

Example: Increase by 20%, then decrease by 10%

$$= 20 - 10 + \frac{(20 \times -10)}{100} = 10 - 2 = 8\%$$

Net % change = 8% increase

✓ 4. Reverse % Calculation

If A is x% more than B,
Then B is less than A by:

$$x100+x \times 100\% \frac{x}{100+x} \times 100\%$$

Example: A is 25% more than B

$$\rightarrow \text{B is less than A by } \frac{25}{125} \times 100 = 20\%$$

✓ 5. Fraction to Percentage Conversion

Fraction Percentage

1/2 50%

1/3 33.33%

1/4 25%

1/5 20%

1/6 16.66%

1/8 12.5%

1/9 11.11%

1/10 10%

👉 Memorize these for quick mental calculations.

✓ 6. Voting Concept

If x% of total votes were valid and y% of valid votes were in favor, then:

- Total valid votes = x% of total votes
- Votes in favor = y% of valid votes

✓ 7. Salary / Income Increase-Decrease

- If salary increases by x% and savings also increase: Use income = expenditure + savings relation to find missing percent.

✓ 8. Population Growth/Decay

- Population after n years with r% rate:

$$P = P_0(1 \pm r/100)^n \quad P = P_0 \left(1 \pm \frac{r}{100}\right)^n \quad P = P_0(1 \pm 100r)^n$$

Use + for growth, - for decay.

✓ 9. Exam Based Trick (Marks Reduction Problem)

If a person gets x% less marks than expected, then actual marks =

$$(1 - x/100) \times \text{Total Marks} \quad \left(1 - \frac{x}{100}\right) \times \text{Total Marks}$$

✓ 10. Comparison Shortcut

If A is x% more than B, then B is $\frac{x}{100+x} \times 100$ % less than A

If A is x% less than B, then B is $\frac{x}{100-x} \times 100$ % more than A