

BANK EXAMS

QUANTITATIVE APTITUDE

PERCENTAGE

Percentage topic is very important in Bank Exams. It is highly useful in solving Simplification questions, Data Interpretation and Arithmetic problems. One needs to be perfect of this topic.

- ★ Percent means per every 100.
- ★ A fraction with denominator 100 is called percentage.

Converting Percent to fraction: To convert percent into fraction, divide the percent by 100.

e.g.: $20\% = \frac{20}{100} = \frac{1}{5}$

Converting Fraction to percent: To convert fraction into percent, multiply the fraction by 100.

e.g.: $\frac{3}{8} = \frac{3}{8} \times 100 = 37.5\%$

- ★ Increment percent = $\frac{\text{Increment}}{\text{Source}} \times 100$
- ★ Decrement percent = $\frac{\text{Decrement}}{\text{Source}} \times 100$

e.g.: A man increased the house rent from Rs.6000 to Rs.6750. What is the increment percent in the rent?

$$\text{Increment}\% = \frac{6750 - 6000}{6000} = \frac{750}{6000} \times 100 = 12.5\%$$

- ★ To express one given quantity (x) as a percentage of another given quantity (y) we have to write $\frac{x}{y} \times 100$.
- ★ When two variables are inversely proportional, If one is 'x' percent more / less than the second one then the second one will be

$$\frac{x}{100 \pm x} \times 100 \text{ percent less / more than the first one.}$$

Note: If first one is more use '+' and it is less use '-'

e.g.: A's salary is 25% more than B's salary. Find by what percent B's salary is less than A's salary.

Sol: required% = $\frac{25}{100 + 25} \times 100 = 20\%$

- ★ If an object's value is increased / decreased by x% and other factor increased / decreased by y%, then the net effect is

$$\left[x + y + \frac{xy}{100} \right] \%$$

Note: The percentages are taken with positive / negative sign accordingly as there is increase / decrease in the factor.

EXERCISE

1. If two numbers are respectively 20% and 25% more than a third number, what percentage is the first of the second?
 - 1) 5%
 - 2) 25%
 - 3) $92\frac{2}{7}\%$
 - 4) 70%
 - 5) None of these

2. A man reduced the length of the table from 5 m 40 cm to 4 m 50 cm. What is the percentage decrement in the length of the table?
1) 19.36% 2) 16.67% 3) 14.72% 4) 12.14%
5) 18.25%
3. The difference between 82% of a number and 27% of the same number is 385. What is 43% of that number?
1) 385 2) 301 3) 528 4) 321
5) None of these
4. Six-elevenths of a number is equal to twenty two percent of the second number. The second number is equal to one-fourth of the third number. The value of the third number is 2400. What is 45% of the first number?
1) 109.8 2) 111.7 3) 108.9 4) 123.4
5) None of these
5. In an entrance examination, A scored 56 percent marks, B scored 92 percent marks and C scored 634 marks. The maximum marks of the examination is 875. What is the average marks scored by all the three together?
1) 1929 2) 815 3) 690 4) 643
5) None of these
6. Production of a company increases 6% per year. If it is Rs.12,25000 in 2012, what will be its production in 2014?
1) Rs.13,25,750.00 2) Rs.13,76,410.00
3) Rs.12,63,525.20 4) Rs.13,35,500.50
5) None of these
7. The length of a rectangle is doubled and the breadth is halved. What is the percentage change in the area?
1) 10% 2) 15% 3) 25% 4) No change
5) None of these
8. A man spends 12% of his monthly income on entertainment, 18% of his monthly income on children's education, 50% of his monthly income on other house-hold items and the remaining amount of Rs.5200 he saves. What is his monthly income?
1) Rs.25400 2) Rs.26500 3) Rs.24500 4) Rs.27300
5) None of these
9. If 4 litres of water is evaporated on boiling from 12 litres of sugar solution containing 20% sugar, find the percentage of sugar in the remaining sugar.
1) 40% 2) 10% 3) 25% 4) 30%
5) None of these
10. 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 12800, the number of valid votes that the other candidate got was
1) 3375 2) 2700 3) 3060 4) 2100
5) None of these
11. In an examination it is required to get 350 of the aggregate marks to pass. A student gets 32% marks and is declared failed by 70 marks. What are the maximum aggregate marks a student can get?
1) 885 2) 865
3) 875 4) Cannot be determined
5) None

12. The production of a company decreased by 25% due to shortage of manpower. Find by what percent should the working hour be increased to restore the original production?
- 1) 20% 2) $33\frac{1}{3}\%$ 3) 50% 4) 25%
- 5) None of these
13. A sample of milk contains 5% water. What quantity of pure milk should be added to 10 litres of milk to reduce the water content to 2%?
- 1) 5 litres 2) 7 litres 3) 15 litres 4) 12 litres
- 5) None of these
14. In measuring the sides of a rectangle, one side is taken 10% in excess, and the other 5% in deficit. What is the change in its area as a percentage?
- 1) 1.5% 2) 5% 3) 2.5% 4) 4.5%
- 5) None of these
15. A's monthly income is three times of B's monthly income, B's monthly income is fifteen percent more than C's monthly income. If C's monthly income is Rs. 32,000, what is A's annual income?
- 1) Rs.1,10,400 2) Rs.13,24,800 3) Rs.36,800 4) Rs.52,200
- 5) None of these

ANSWERS

1-5; 2-2; 3-2; 4-3; 5-4; 6-2; 7-4; 8-5; 9-4; 10-5; 11-3; 12-2; 13-3; 14-4; 15-2.

EXPLANATIONS

1. Let the third number be 100

$$\therefore \text{First number} = 100 + 20\% \text{ of } 100 = 120$$

$$\text{and Second number} = 100 + 25\% \text{ of } 100 = 125$$

Percentage of the first number to the second number...

$$= \frac{120}{125} \times 100 = 96\%$$

2. Decrement% = $\frac{540 - 450}{540} \times 100$

$$\Rightarrow \frac{90}{540} \times 100 = 16.67\%$$

3. Difference between 82% and 27% is 55%, if 55% value is 385, then 43% value is

$$\frac{43}{55} \times 385 = 301$$

4. Let the first number be 'X' and second number be 'Y'

$$\therefore Y = \frac{1}{4} \times 2400 = 600$$

$$\frac{6}{11} \text{ of } X = 22\% \text{ of } 600 = 132$$

$$\Rightarrow X = 132 \times \frac{11}{6} = 242$$

$$\therefore 45\% \text{ of } 242 = 108.9$$

5. A marks = 56% of 875 = 490

$$\text{B marks} = 92\% \text{ of } 875 = 805$$

C marks = 634

Total marks = 490 + 805 + 634 = 1929

$$\therefore \text{Average marks} = \frac{1929}{3} = 643$$

6. Production after 2 years (2012 – 2014) will be 106% of 106% of 1225000

$$\Rightarrow \frac{106}{100} \times \frac{106}{100} \times 1225000 = 1376410$$

7. Let the length be 10 breadth also be 10

\therefore Area is $10 \times 10 = 100$

New length = 20 (doubled) and new breadth is 5 (halved)

New area is $20 \times 5 = 100$

\therefore No change in the area

8. Total expenses is $12\% + 18\% + 50\% = 80\%$

Remaining percent is $100\% - 80\% = 20\%$

Savings = Rs.5200

$\therefore 20\% = 5200$

100% (Total) money is $\frac{100}{20} \times 5200$

= Rs.26000

9. Sugar quantity is 20% of 12 = 2.4

Sugar quantity will be the same in the remaining solution as only water evaporates when boiled

\therefore required percentage of sugar is

$$\frac{2.4}{8} \times 100 = 30\%$$

10. Number of valid votes is 80 % of 12800

= 10240

Votes received by second candidate is 45% of 10240

$$\Rightarrow \frac{45}{100} \times 10240 = 4608$$

11. $32\% + 70 = 350 \Rightarrow 32\% = 280$

$$\therefore \text{Total marks (100 \%)} = \frac{100}{32} \times 280 = 875$$

12. The required% = $\frac{25}{100 - 25} \times 100$

$$= \frac{25}{75} \times 100 = 33 \frac{1}{3} \%$$

13. Water in sample = 5% of 10 = 0.5 litre

Milk in sample = 9.5 litre

Let x litre milk is added to the sample

$$\therefore 9.5 + x = 98\%(10 + x) \Rightarrow x = 15$$

14. Let the length be 10 and breadth also be 10

\therefore Area = $10 \times 10 = 100$

New length (10% excess) = 11

New breadth (5% deficit) = 9.5

$$\text{New area} = 11 \times 9.5 = 104.5$$

$$\therefore \text{Change in area} = 104.5 - 100 = 4.5$$

$$\text{Percentage change} = \frac{4.5}{100} \times 100 = 4.5\%$$

15. C's monthly income = Rs.32000

$$\begin{aligned} \therefore \text{B's monthly income} &= 115\% \text{ of } 32000 \\ &= \text{Rs.}36800 \end{aligned}$$

$$\begin{aligned} \text{A's monthly income} &= 3 \times 36800 \\ &= \text{Rs.}110400 \end{aligned}$$

$$\begin{aligned} \therefore \text{A's annual income} &= 12 \times 110400 \\ &= \text{Rs.}1324800 \end{aligned}$$

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