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PERCENTAGE

Importance : For percentage it may be mentioned that in every chapter of arithmetic, percentage based questions are asked, hence practice and expertise is essential. Moreover by solving percentage questions we get idea of many other basic concepts.

Scope of questions : Percentage, based questions are mainly arithmetic and from sale, purchase, Profit & Loss, Discount, Interest, Number system, Alligation, Reduction in cost, Population based chapters.

Way to success : Deep study of percentage is required with complete accuracy and rechecking habit. Rechecking of answers is must for this chapter.

IMPORTANT POINTS

Percentage : Percentage refers to "Per hundred" i.e., 8% means 8 out of hundred or $\frac{8}{100}$. Percentage is denoted by '%'.
 a represented as the per cent of b as, $\frac{a}{b} \times 100$
 b% of a = $a \times \frac{b}{100}$
 To Convert a fraction/Decimal into percentage multiply it by 100.
 As $0.35 = \frac{35}{100} = \frac{35}{100} \times 100\% = 35\%$
 To convert a per cent into fraction divide it by 100
 As $12.5\% = \frac{12.5}{100} = \frac{1}{8}$

Rule 1 : If x is reduced to x_0 , then,

$$\text{Reduce \%} = \frac{x - x_0}{x} \times 100$$

Rule 2 : If x is increased to x_1 , then,

$$\text{Increment\%} = \frac{x_1 - x}{x} \times 100$$

Rule 3 : If an amount is increased by a% and then it is reduced by a% again, then percentage change will be a decrease of $\frac{a^2}{100}\%$

Rule 4 : If a number is increased by a% and then it is decreased by b%, then resultant change in percentage will

$$\text{be } \left(a - b - \frac{ab}{100} \right)\%$$

(Negative for decrease, Positive for increase)

Rule 5 : If a number is decreased by a% and then it is increased by b%, then net increase or decrease per cent is

$$\left(-a + b - \frac{ab}{100} \right)\% \quad \begin{matrix} \text{(Negative sign for decrease)} \\ \text{(Positive sign for increase)} \end{matrix}$$

Rule 6 : If a number is first decreased by a% and then by b%, then net decrease per cent is $\left(-a - b + \frac{ab}{100} \right)\%$
 (-ve sign for decrease)

Rule 7 : If a number is first increased by a% and then again increased by b%, then total increase per cent is

$$\left(a + b + \frac{ab}{100} \right)\%$$

Rule 8 : If the cost of an article is increased by A%, then how much to decrease the consumption of article, so that expenditure remains same is given by

OR

If the income of a man is A% more than another man, then income of another man is less in comparison to the 1st man by

$$\left(\frac{A}{(100 + A)} \times 100 \right)\%$$

Rule 9 : If the cost of an article is decreased by A%, then the increase in consumption of article to maintain the expenditure will be?

OR

If 'x' is A% less than 'y', then y is more than 'x' by

$$\text{Required\%} = \left(\frac{A}{(100 - A)} \times 100 \right)\% \text{ (increase)}$$

Rule 10 : If the length of a rectangle is increased by a% and breadth is increased by b%, then the area of rectangle will increase by

$$\text{Required Increase} = \left(a + b + \frac{ab}{100} \right)\%$$

Note: If a side is increased, take positive sign and if it is decreased, take negative sign. It is applied for two dimensional figures.

Rule 11 : If the side of a square is increased by a% then, its area will increase by

$$\left(2a + \frac{a^2}{100} \right)\% = \left(a + a + \frac{a \cdot a}{100} \right)\%$$

The above formula is also implemented for circle where radius is used as side. This formula is used for two dimensional geometrical figures having both length and breadth equal.

Rule 12 : If the side of a square is decreased by a%, then the area of square will decrease by

$$\therefore \text{Decrease} = \left(-2a + \frac{a^2}{100} \right)\%$$

This formula is also applicable for circles. where decrease % of radius is given.

Rule 13 : If the length, breadth and height of a cuboid are increased by a%, b% and c% respectively, then, Increase% in volume

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$$= \left[a + b + c + \frac{ab + bc + ca}{100} + \frac{abc}{(100)^2} \right] \%$$

Rule 14 : If every side of cube is increased by a%, then increase % in volume

$$= \left(3a + \frac{3a^2}{100} + \frac{a^3}{(100)^2} \right) \%$$

This formula will also be used in calculating increase in volume of sphere, where increase in radius is given.

Rule 15 : If a% of a certain sum is taken by 1st man and b% of remaining sum is taken by 2nd man and finally c% of remaining sum is taken by 3rd man, then if 'x' rupee is the remaining amount then,

$$\text{Initial amount} = \frac{100 \times 100 \times 100 \times x}{(100 - a)(100 - b)(100 - c)}$$

Rule 16 : If an amount is increased by a% and then again increased by b% and finally increased by c%, So, that resultant amount is 'x' rupees, then,

$$\text{Initial amount} = \frac{100 \times 100 \times 100 \times x}{(100 + a)(100 + b)(100 + c)}$$

Rule 17 : If the population/cost of a certain town/article, is P and annual increment rate is r%, then

$$(i) \text{ After 't' years population/cost} = P \left(1 + \frac{r}{100} \right)^t$$

$$(ii) \text{ Before 't' years population/cost} = \frac{P}{\left(1 + \frac{r}{100} \right)^t}$$

Rule 18 : If the population/cost of a town/article is P and it decreases/reduces at the rate of r% annually, then,

$$(i) \text{ After 't' years population/cost} = P \left(1 - \frac{r}{100} \right)^t$$

$$(ii) \text{ Before 't' years population/cost} = \frac{P}{\left(1 - \frac{r}{100} \right)^t}$$

Rule 19 : On increasing/decreasing the cost of a certain article by x%, a person can buy 'a' kg article less/more in 'y' rupees, then

$$\text{Increased/decreased cost of the article} = \left(\frac{xy}{100 \times a} \right)$$

And initial cost

$$= \frac{xy}{(100 \pm x)a} \quad [\text{Negative sign when decreasing and positive sign when increasing}]$$

Rule 20 : If a person saves 'R' rupees after spending x% on food, y% on cloth and z% on entertainment of his income then,

$$\text{Monthly income} = \frac{100}{100 - (x + y + z)} \times R$$

Rule 21 : The amount of acid/milk is x% in 'M' litre mixture. How much water should be mixed in it so that percentage amount of acid/milk would be y%?

$$\text{Amount of water} = \frac{M(x - y)}{y}$$

Rule 22 : An examinee scored m% marks in an exam, and failed by p marks. In the same examination another examinee obtained n% marks and passed with q more marks than minimum, then

$$\therefore \text{Maximum marks} = \frac{100}{(n - m)} \times (p + q)$$

Rule 23 : In an examination, a% candidates failed in Maths and b% candidates failed in English. If c% candidate failed in both the subjects, then,

(i) Passed candidates in both the subjects

$$= 100 - (a + b - c)\%$$

(ii) Percentage of candidates who failed in either subject

$$= (a + b - c)\%$$

Rule 24 : In a certain examination passing marks is a%. If any candidate obtains 'b' marks and fails by 'c' marks, then,

$$\text{Total marks} = \frac{100(b + c)}{a}$$

Rule 25 : In a certain examination, 'B' boys and 'G' girls participated. b% of boys and g% of girls passed the examination, then,

Percentage of passed students of the total students =

$$\left(\frac{B.b + G.g}{B + G} \right) \%$$

Rule 26 : If a candidate got A% votes in a poll and he won or defeated by 'x' votes, then, what was the total no. of votes which was casted in poll?

$$\therefore \text{Total no. of votes} = \frac{50 \times x}{(50 - A)}$$

Rule 27 : If a number 'a' is increased or decreased by

$$b\%, \text{ then the new number will be } \left(\frac{100 \pm b}{100} \right) \times a$$

Rule 28 : If the present population of a town is P and the population increases or decreases at rate of R₁%, R₂% and R₃% in first, second and third year respectively.

then the population of town after 3 years =

$$P \left(1 \pm \frac{R_1}{100} \right) \left(1 \pm \frac{R_2}{100} \right) \left(1 \pm \frac{R_3}{100} \right)$$

'+' is used when population increases

'-' is used when population decreases.

The above formula may be extended for n number of years.

⇒ Population after 'n' years

$$= P \left(1 \pm \frac{R_1}{100} \right) \left(1 \pm \frac{R_2}{100} \right) \dots \dots \dots \left(1 \pm \frac{R_n}{100} \right)$$

Rule 29 : If two numbers are respectively x% and y% less than the third number, first number as a percentage of

$$\text{second is } \frac{100 - x}{100 - y} \times 100\%$$

Rule 30 : If two numbers are respectively x% and y% more than a third number the first as percentage of second

$$\text{is } \frac{100 + x}{100 + y} \times 100\%$$

Rule 31 : If the price of an article is reduced by a% and buyer gets c kg more for some Rs. b, the new

$$\text{price per kg of article} = \frac{ab}{100 \times c}$$

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QUESTIONS ASKED IN PREVIOUS SSC EXAMS

TYPE-I

1. If 80% of A = 50% of B and B = x% of A, then the value of x is :
 (1) 400 (2) 300
 (3) 160 (4) 150
 (SSC CGL Prelim Exam. 04.07.1999 (First Sitting))
2. If x is 80% of y, what percent of y is x ?
 (1) 75% (2) 80%
 (3) 100% (4) 125%
 (SSC CGL Prelim Exam. 04.07.1999 (First Sitting))
3. If 8% of x is the same as 4% of y, then 20% of x is the same as:
 (1) 10% of y (2) 16% of y
 (3) 80% of y (4) 50% of y
 (SSC CGL Prelim Exam. 04.07.1999 (Second Sitting))
4. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. What is the percentage error in the calculation ?
 (1) 44% (2) 34%
 (3) 54% (4) 64%
 (SSC CGL Prelim Exam. 04.07.1999 (Second Sitting))
5. If p% of p is 36, then p is equal to :
 (1) 3600 (2) 600
 (3) 60 (4) 15
 (SSC CGL Prelim Exam. 27.02.2000 (First Sitting))
6. 2 is what percent of 50?
 (1) 2 (2) 2.5
 (3) 4 (4) 5
 (SSC CGL Prelim Exam. 27.02.2000 (First Sitting))
7. $\frac{2}{3}$ is what percent of $\frac{1}{3}$?
 (1) 50% (2) $33\frac{1}{3}\%$
 (3) 150% (4) 200%
 (SSC CGL Prelim Exam. 27.02.2000 (Second Sitting))
8. 0.15% of $33\frac{1}{3}\%$ of ₹ 10000 is :
 (1) ₹ 5 (2) ₹ 150
 (3) ₹ 0.05 (4) ₹ 105
 (SSC CGL Prelim Exam. 24.02.2002 (First Sitting))
9. 30% of x is 72. The value of x is:
 (1) 216 (2) 240
 (3) 480 (4) 640
 (SSC CGL Prelim Exam. 24.02.2002 (First Sitting))
10. If 15% of (A + B) = 25% of (A - B), then what per cent of B is equal to A?
 (1) 10% (2) 60%
 (3) 200% (4) 400%
 (SSC CGL Prelim Exam. 24.02.2002 (First Sitting))
11. What is 20% of 25% of 300?
 (1) 150 (2) 60
 (3) 45 (4) 15
 (SSC CGL Prelim Exam. 24.02.2002 (Second Sitting))
12. If x% of $\frac{25}{2}$ is 150, then the value of x is :
 (1) 1000 (2) 1200
 (3) 1400 (4) 1500
 (SSC CGL Prelim Exam. 24.02.2002 (Second Sitting))
13. If 50% of (x - y) = 30% of (x + y), then what per cent of x is y?
 (1) 25% (2) $33\frac{1}{3}\%$
 (3) 40% (4) 400%
 (SSC CGL Prelim Exam. 24.02.2002 (IInd Sitting) & 13.11.2005 (Ist Sitting))
14. If 50 % of P = 25% of Q, then P = x% of Q. Find x.
 (1) 0.5 (2) 2
 (3) 50 (4) 0.005
 (SSC CGL Prelim Exam. 24.02.2002 (Middle Zone))
15. If 20% of A = 50% of B, then what per cent of A is B ?
 (1) 30% (2) 40%
 (3) 25% (4) 15%
 (SSC CGL Prelim Exam. 24.02.2002 (Middle Zone))
16. In a school 40% of the students play football and 50% play cricket. If 18% of the students neither play football nor cricket, the percentage of the students playing both is :
 (1) 40% (2) 32%
 (3) 22% (4) 8%
 (SSC CPO S.I. Exam. 26.05.2005)
17. If 20% of (P + Q) = 50% of (P - Q), then find P : Q
 (1) 7 : 8 (2) 7 : 3
 (3) 7 : 5 (4) 5 : 7
 (SSC CGL Prelim Exam. 13.11.2005 (Second Sitting))
18. 0.01 is what per cent of 0.1 ?
 (1) 10 (2) $\frac{1}{10}$
 (3) 100 (4) $\frac{1}{100}$
 (SSC CGL Prelim Exam. 13.11.2005 (Second Sitting))
19. 65g is what per cent of 2 kg ?
 (1) $\frac{13}{4}$ (2) $\frac{65}{2}$
 (3) $\frac{15}{8}$ (4) $\frac{13}{8}$
 (SSC CGL Prelim Exam. 27.07.2008 (First Sitting))
20. Half of 1 per cent, written as a decimal, is
 (1) 0.2 (2) 0.02
 (3) 0.005 (4) 0.05
 (SSC CGL Prelim Exam. 27.07.2008 (First Sitting))
21. The time duration of 1 hour 45 minutes is what percent of a day?
 (1) 7.218 % (2) 7.292 %
 (3) 8.3 % (4) 8.24 %
 (SSC CGL Prelim Exam. 27.07.2008 (Second Sitting))
22. 1.14 expressed as a per cent of 1.9 is
 (1) 6% (2) 10%
 (3) 60% (4) 90%
 (SSC CGL Tier-I Exam. 16.05.2010 (First Sitting))
23. 32 is what per cent of 80 ?
 (1) 24% (2) 25.6%
 (3) 36% (4) 40%
 (SSC CPO S.I. Exam. 12.12.2010 (Paper-I))
24. If 90% of A = 30% of B and B = x% of A, then the value of x is
 (1) 800 (2) 300
 (3) 700 (4) 400
 (SSC CGL Tier-1 Exam 19.06.2011 (Second Sitting))
25. If 90% of A = 30% of B and B = 2x% of A, then the value of x is
 (1) 450 (2) 400
 (3) 300 (4) 150
 (SSC CGL Tier-1 Exam 26.06.2011 (First Sitting))



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- 26.** If 30% of A is added to 40% of B, the answer is 80% of B. What percentage of A is B?

(1) 30% (2) 40%
(3) 70% (4) 75%

(SSC CGL Tier-1 Exam 26.06.2011
(First Sitting))

- 27.** If 40% of $(A + B) = 60\%$ of

$(A - B)$ then $\frac{2A - 3B}{A + B}$ is

(1) $\frac{7}{6}$ (2) $\frac{6}{7}$

(3) $\frac{5}{6}$ (4) $\frac{6}{5}$

FCI Assistant Grade-III
Exam. 25.02.2012 (Paper-I)
North Zone (1st Sitting)

- 28.** 0.001 is equivalent to

(1) 10% (2) 1%
(3) 0.01% (4) 0.1%

(SSC CPO S.I.)

Exam. 12.12.2010 (Paper-I)

- 29.** What percent of 3.5 kg is 70 gms ?

(1) 3% (2) 4%
(3) 5% (4) 2%

(SSC Section Officer (Commercial Audit)
Exam. 25.09.2005)

- 30.** One-third of 1206 is what percent of 134 ?

(1) 100% (2) 150%
(3) 200% (4) 300%

(SSC CISF Constable (GD))

Exam. 05.06.2011)

- 31.** If 120% of a is equal to 80% of

b , then $\frac{b+a}{b-a}$ is equal to

(1) 5 (2) 6
(3) 7 (4) 8

(SSC CHSL DEO CHSL DEO & LDC
Exam. 11.12.2011

(1st Sitting (Delhi Zone))

- 32.** If 20% of $(A + B) = 50\%$ of B, then

value of $\frac{2A - B}{2A + B}$ is

(1) $\frac{1}{2}$ (2) $\frac{1}{3}$

(3) $\frac{1}{4}$ (4) 1

(SSC CHSL DEO & LDC Exam.
11.12.2011 (IInd Sitting (East Zone))

- 33.** If $x\%$ of a is the same as $y\%$ of b , then $z\%$ of b will be

(1) $\frac{yz}{x}\%$ of a (2) $\frac{zx}{y}\%$ of a

(3) $\frac{xy}{z}\%$ of a (4) $\frac{y}{z}\%$ of a

(SSC Constable (GD) & Rifleman
(GD) Exam. 22.04.2012 (1st Sitting))

- 34.** If $Y\%$ of one hour is 1 minute 12 seconds, then Y is equal to

(1) 2 (2) 1

(3) $\frac{1}{2}$ (4) $\frac{1}{4}$

(SSC Constable (GD) & Rifleman
(GD) Exam. 22.04.2012 (IInd Sitting))

- 35.** What percent of 3.6 kg is 72 gms. ?

(1) 32% (2) 22%
(3) 12% (4) 2%

(SSC Graduate Level Tier-I
Exam. 11.11.2012 (1st Sitting))

- 36.** 31% of employees pay tax in the year 2008. Non-tax paying employees are 20,700. The total number of employees is :

(1) 31,160 (2) 64,750
(3) 30,000 (4) 66,775

(SSC CHSL DEO & LDC Exam.
21.10.2012, IInd Sitting)

- 37.** A team played 40 games in a season and won in 24 of them. What percent of games played did the team win?

(1) 70% (2) 40%
(3) 60% (4) 35%

(SSC CHSL DEO & LDC Exam.
04.11.2012, 1st Sitting)

- 38.** If 125% of x is 100, then x is :

(1) 80 (2) 150
(3) 400 (4) 125

(SSC CHSL DEO & LDC Exam.
04.11.2012, 1st Sitting)

- 39.** 498 is 17% less than the number by

(1) 610 (2) 580
(3) 600 (4) 620

(SSC Multi-Tasking Staff Exam.
10.03.2013, 1st Sitting : Patna)

- 40.** Given A is 50% larger than C and B is 25% larger than C, then A is what percent larger than B ?

(1) 25% (2) 50%
(3) 75% (4) 20%

(SSC Graduate Level Tier-I
Exam. 21.04.2013, 1st Sitting)

- 41.** In a big garden 60% of the trees are coconut trees, 25% of the number of coconut trees are mango trees and 20% of the number of mango trees are apple trees. If the number of apple trees are 1500, then the number of trees in the garden is :

(1) 48000 (2) 50000
(3) 51000 (4) 45000

(SSC CAPFs SI & CISF ASI
Exam. 23.06.2013)

- 42.** The population of a village is 25,000. One fifth are females and the rest are males. 5% of males and 40% of females are uneducated. What percentage on the whole are educated?

(1) 75% (2) 88%
(3) 55% (4) 85%

(SSC Multi-Tasking Staff
Exam. 24.03.2013, 1st Sitting)

- 43.** What is to be added to 15% of 160 so that the sum may be equal to 25% of 240 ?

(1) 24 (2) 84
(3) 60 (4) 36

(SSC Multi-Tasking Staff
Exam. 10.03.2013)

- 44.** A number is divided into two parts in such a way that 80% of 1st part is 3 more than 60% of 2nd part and 80% of 2nd part is 6 more than 90% of the 1st part. Then the number is

(1) 125 (2) 130
(3) 135 (4) 145

(SSC CHSL DEO & LDC Exam.
28.10.2012, 1st Sitting)

- 45.** In a college, 40% of the students were allotted group A, 75% of the remaining were given group B and the remaining 12 students were given group C. Then the number of students who applied for the group is

(1) 100 (2) 60
(3) 80 (4) 92

(SSC Graduate Level Tier-I
Exam. 19.05.2013 1st Sitting)

- 46.** A box has 100 blue balls, 50 red balls, 50 black balls. 25% of blue balls and 50% of red balls are taken away. Percentage of black balls at present is

(1) 50% (2) 25%
(3) $33\frac{1}{3}\%$ (4) 40%

(SSC Graduate Level Tier-I
Exam. 19.05.2013 1st Sitting)



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- 47.** A dozen pairs of socks quoted at ₹ 180 are available at discount of 20%. How many pairs of socks can be bought for ₹ 48?

(1) 3 pairs (2) 4 pairs
(3) 2 pairs (4) 5 pairs

(SSC Graduate Level Tier-I Exam. 19.05.2013 1st Sitting)

- 48.** If three-fifth of sixty per cent of a number is 36, the number is

(1) 100 (2) 80
(3) 75 (4) 90

(SSC CPO S.I. Exam. 03.09.2006)

- 49.** If 50% of $(P - Q) = 30\%$ of $(P + Q)$ and $Q = x\%$ of P , then the value of x is :

(1) 30 (2) 25
(3) 20 (4) 50

(SSC CAPFs SI & CISF ASI Exam. 23.06.2013)

- 50.** Out of two numbers, 40% of the greater number is equal to 60% of the smaller. If the sum of the numbers is 150, then the greater number is

(1) 70 (2) 80
(3) 90 (4) 60

(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting))

- 51.** If 80% of a number added to 80 gives the result as the number itself, then the number is

(1) 200 (2) 300
(3) 400 (4) 500

(SSC CGL Prelim Exam. 04.07.1999 (First Sitting))

- 52.** If 120 is 20% of a number, then 120% of that number will be :

(1) 20 (2) 120
(3) 480 (4) 720

(SSC CGL Prelim Exam. 04.07.1999 (IInd Sitting) & (SSC SO Exam. 16.11.2003 & Data Entry & LDC Exam. 10.11.2013))

- 53.** When 60 is subtracted from 60% of a number, the result is 60. The number is :

(1) 120 (2) 150
(3) 180 (4) 200

(SSC CGL Prelim Exam. 27.02.2000 (First Sitting))

- 54.** When 75% of a number is added to 75, the result is the same number. Find the number :

(1) 225 (2) 270
(3) 300 (4) 325

(SSC CGL Prelim Exam. 27.02.2000 (Second Sitting))

- 55.** Two numbers are respectively 20% and 50% of a third number. What per cent is the first number of the second?

(1) 10% (2) 20%
(3) 30% (4) 40%

(SSC CGL Prelim Exam. 24.02.2002)

(First Sitting)

- 56.** Two numbers are respectively 25% and 20% less than a third number. What per cent is the first number of the second ?

(1) 5% (2) 75%
(3) 80% (4) 93.75%

(SSC CGL Prelim Exam. 24.02.2002)

(Second Sitting)

- 57.** The sum of the numbers of boys and girls in a school is 150. If the number of boys is x , the number of girls becomes $x\%$ of the total number of students. The number of boys is :

(1) 90 (2) 50
(3) 40 (4) 60

(SSC CGL Prelim Exam. 24.02.2002)

(Second Sitting)

- 58.** 18% of which number is equal to 12% of 75 ?

(1) 50 (2) 100

(3) 2 (4) $\frac{3}{2}$

(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone))

- 59.** Difference of two numbers is

1660. If $6\frac{1}{2}\%$ of one number is

$8\frac{1}{2}\%$ of the other number, the smaller number is

(1) 7055 (2) 5395
(3) 3735 (4) 2075

(SSC CGL Prelim Exam. 11.05.2003)

(Second Sitting)

- 60.** When 75 is added to 75% of a number, the answer is the number. Find 40% of that number.

(1) 100 (2) 80
(3) 120 (4) 160

(SSC CGL Tier-I)

Re-Exam. (2013) 27.04.2014

- 61.** The number that is to be added to 10% of 320 to have the sum as 30% of 230 is

(1) 37 (2) 32
(3) 23 (4) 73

(SSC CGL Tier-II Exam. 21.09.2014)

- 62.** If X is 20% less than Y , then find

the values of $\frac{Y - X}{Y}$ and $\frac{X}{X - Y}$.

(1) $\frac{1}{5}$, - 4 (2) 5, - $\frac{1}{4}$

(3) $\frac{2}{5}$, - $\frac{5}{2}$ (4) $\frac{3}{5}$, - $\frac{5}{3}$

(SSC CHSL DEO & LDC Exam. 02.11.2014 (IInd Sitting))

- 63.** 1% of 1% of 25% of 1000 is

(1) 0.025 (2) 0.0025
(3) 0.25 (4) 0.000025

(SSC CHSL DEO & LDC Exam. 9.11.2014)

- 64.** 25% of 120 + 40% of 380 = ? of 637

(1) $\frac{2}{7}$ (2) $\frac{1}{7}$

(3) $\frac{4}{7}$ (4) $\frac{3}{7}$

(SSC CGL Tier-I Re-Exam. (2013) 20.07.2014 (IInd Sitting))

- 65.** In a village 30% of the population is literate. If the total population of the village is 6,600, then the number of illiterate is

(1) 1980 (2) 4620
(3) 2200 (4) 3280

(SSC CHSL DEO & LDC Exam. 16.11.2014)

- 66.** If 8% of $x = 4\%$ of y , then 20% of x is

(1) 10% of y (2) 16% of y
(3) 40% of y (4) 80% of y

(SSC CHSL DEO Exam. 16.11.2014 (Ist Sitting))

- 67.** If 40% of $\frac{4}{5}$ of $\frac{3}{4}$ of a number is

48, then what is 1% of the same number ?

(1) 20 (2) 2
(3) 10 (4) 1

(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 22.06.2014 TF No. 999 KP0)

- 68.** The sum of (16% of 24.2) and (10% of 2.42) is

(1) 4.114 (2) 41.14
(3) 411.4 (4) 0.4114

(SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014, Ist Sitting TF No. 333 LO 2)



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- 69.** What percent of 15 hours is 18 seconds ?

(1) 30% (2) $\frac{1}{30}$ %
 (3) 36% (4) $\frac{1}{36}$ %

(SSC CHSL (10+2) DEO & LDC
Exam. 16.11.2014, 1st Sitting
TF No. 333 LO 2)

- 70.** If $x\%$ of $y\%$ of 80 is the same as 25% of 900, then the value of xy is

(1) 30100 (2) 32500
 (3) 28125 (4) 34200

(SSC CHSL (10+2) DEO & LDC
Exam. 16.11.2014, 1st Sitting
TF No. 333 LO 2)

- 71.** A supply of juice lasts for 35 days. If its use is increased by 40% the number of days would the same amount of juice lasts, is

(1) 25 days (2) 30 days
 (3) 24 days (4) 27 days

(SSC CGL Tier-II Exam. 12.04.2015
TF No. 567 TL 9)

- 72.** If 60% of A = 30% of B, B = 40% of C, C = $x\%$ of A, then value of x is

(1) 200 (2) 500
 (3) 800 (4) 300

(SSC CGL Tier-II Exam,
25.10.2015, TF No. 1099685)

- 73.** In an office, 40% of the staff is female. 70% of the female staff and 50% of the male staff are married. The percentage of the unmarried staff in the office is

(1) 64 (2) 60
 (3) 54 (4) 42

(SSC CGL Tier-II Exam,
25.10.2015, TF No. 1099685)

- 74.** 50% of a number when added to 50 is equal to the number. The number is

(1) 50 (2) 75
 (3) 100 (4) 150

(SSC CHSL (10+2) LDC, DEO & PA/SA
Exam. 01.11.2015, IIInd Sitting)

- 75.** $83\frac{1}{3}\%$ of Rs. 90 is equal to 60% of ?

(1) Rs. 123 (2) Rs. 124
 (3) Rs. 122 (4) Rs. 125

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam. 06.12.2015
(IIInd Sitting) TF No. 3441135)

- 76.** 51% of a whole number is 714. 25% of that number is

(1) 350 (2) 450
 (3) 550 (4) 250

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam. 20.12.2015
(1st Sitting) TF No. 9692918)

- 77.** Due to 25% fall in the rate of eggs, one can buy 2 dozen eggs more than before by investing Rs.162. Then the original rate per dozen of the eggs is

(1) Rs. 22 (2) Rs. 24
 (3) Rs. 27 (4) Rs. 30

(SSC CGL Tier-II Online
Exam.01.12.2016)

- 78.** What per cent of a day is 30 minutes?

(1) 2.83 (2) 2.083
 (3) 2.09 (4) 2.075

(SSC CGL Tier-II Online
Exam.01.12.2016)

- 79.** A basket contains 300 mangoes. 75 mangoes were distributed among some students. Find the percentage of mangoes left in the basket.

(1) 70% (2) 72%
 (3) 76% (4) 75%

(SSC CHSL (10+2) Tier-I (CBE)
Exam. 08.09.2016 (1st Sitting))

- 80.** The weights of two iron balls are 3.5 kg and 7.5 kg. What is the percentage weight of the first ball with respect to second ball?

(1) $46\frac{2}{3}\%$ (2) 35%

(3) $46\frac{1}{3}\%$ (4) 45%

(SSC CGL Tier-I (CBE)

Exam. 09.09.2016 (1st Sitting))

- 81.** A store has an offer 'Buy 4 Get 1 Free'. What is the net percentage of discount?

(1) 25% (2) 33.3%

(3) 20% (4) Insufficient Data

(SSC CAPFs (CPO) SI & ASI,
Delhi Police Exam. 05.06.2016
(1st Sitting))

- 82.** If A earns 25% more than B then how much percent does B earns less than A :

(1) 15% (2) 20%

(3) 25% (4) 30%

(SSC CPO SI & ASI, Online

Exam. 06.06.2016 (IIInd Sitting))

- 83.** What per cent of 1 day is 36 minutes?

(1) 25% (2) 2.5%
 (3) 3.6% (4) 0.25%

(SSC CGL Tier-I (CBE)

Exam. 03.09.2016 (IIInd Sitting))

- 84.** One number is 25% of another number. The larger number is 12 more than the smaller. The larger number is

(1) 48 (2) 16
 (3) 4 (4) 12

(SSC CGL Tier-I (CBE)

Exam. 04.09.2016 (1st Sitting))

- 85.** The number of students in a class is increased by 20% and the number now becomes 66. Initially the number was

(1) 45 (2) 50
 (3) 55 (4) 60

(SSC CGL Tier-I (CBE)

Exam. 02.09.2016 (IIInd Sitting))

- 86.** A number is increased by 20%. To get back to the original number, the increased number is to be reduced by

(1) 20% (2) 21%

(3) $16\frac{2}{3}\%$ (4) $14\frac{1}{3}\%$

(SSC CGL Tier-II (CBE)

Exam. 30.11.2016)

- 87.** A village lost 12% of its goats in a flood and 5% of remainder died from diseases. If the number left now is 8360, what was the original number before the flood?

(1) 1000 (2) 10000
 (3) 1,00,000 (4) 8360

(SSC CGL Tier-II (CBE)

Exam. 30.11.2016)

- 88.** If A is equal to 20% of B and B is equal to 25% of C; then what per cent of C is equal to A?

(1) 10 (2) 15
 (3) 5 (4) 20

(SSC CGL Tier-I (CBE)

Exam. 29.08.2016 (1st Sitting))

- 89.** In a school there are 1500 students, 44% of them are girls. Monthly fee of each boy is Rs. 540 and the fee of each girl is 25% less than that of a boy. The sum of fees of boys and girls both is

(1) Rs. 720600 (2) Rs. 720800
 (3) Rs. 720900 (4) Rs. 721000

(SSC CGL Tier-I (CBE)

Exam. 03.09.2016 (IIInd Sitting))

- 90.** In a marriage party 32% are women, 54% are men and there are 196 children. How many men are there in the marriage party?

(1) 756 (2) 448
 (3) 332 (4) 324

(SSC CGL Tier-I (CBE)

Exam. 04.09.2016 (IIInd Sitting))

- 91.** $6\frac{1}{4}\%$ of 1600 + $12\frac{1}{2}\%$ of 800 equals

(1) 100 (2) 200
 (3) 300 (4) 400

(SSC CGL Tier-I (CBE)

Exam. 09.09.2016 (IIInd Sitting))



PERCENTAGE

92. Refer the following data table and answer the following question.

	Boys	Girls
Medical	30	70
Engineering	75	25

What per cent of students who chose Engineering are girls?

- (1) 26.32 (2) 12.5
(3) 25 (4) 33.33

(SSC CHSL (10+2) Tier-I (CBE)
Exam. 15.01.2017 (IInd Sitting)

93. Refer the following data table and answer the following Question.

	Boys	Girls
Medical	35	60
Engineering	40	40

What per cent of students who chose Engineering are girls?

- (1) 40 (2) 22.86
(3) 50 (4) 100

(SSC CHSL (10+2) Tier-I (CBE)
Exam. 16.01.2017 (IInd Sitting)

94. A boy found the answer for the question "subtract the sum of $\frac{1}{4}$

and $\frac{1}{5}$ from unity and express the answer in decimals" as 0.45. The percentage of error in his answer was

- (1) $\left(\frac{100}{11}\right)\%$ (2) 50%
(3) 10% (4) $\left(\frac{200}{11}\right)\%$

(SSC CGL Tier-II (CBE)
Exam. 12.01.2017)

TYPE-II

1. If x is less than y by 25% then y exceed x by :

- (1) $33\frac{1}{3}\%$ (2) 25%

- (3) 75% (4) $66\frac{2}{3}\%$

(SSC CGL Prelim Exam. 04.07.1999
(Second Sitting)

2. If x is 10% more than y , then by what per cent is y less than x ?

- (1) $9\frac{1}{11}\%$ (2) $7\frac{1}{11}\%$

- (3) $8\frac{1}{11}\%$ (4) $10\frac{1}{11}\%$

(SSC CPO S.I. Exam. 07.09.2003)

3. If A's height is 10% more than B's height, by how much per cent less is B's height than that of A?

- (1) 10% (2) $10\frac{1}{9}\%$

- (3) $10\frac{1}{11}\%$ (4) $9\frac{1}{11}\%$

(SSC CPO S.I. Exam. 26.05.2005)

4. B got 20% marks less than A. What per cent marks did A get more than B?

- (1) 20% (2) 25%
(3) 12% (4) 80%

(SSC CGL Prelim Exam. 27.07.2008
(First Sitting)

5. If x earns 25% more than y . What percent less does y earn than x ?

- (1) 16% (2) 10%
(3) 20% (4) 25%

(SSC CGL Prelim Exam. 27.07.2008
(Second Sitting)

6. The difference of two numbers is 20% of the larger number. If the smaller number is 20, the larger number is :

- (1) 25 (2) 45
(3) 50 (4) 80

(SSC CGL Prelim Exam. 27.02.2000
(Second Sitting)

7. If a number x is 10% less than another number y and y is 10% more than 125, then x is equal to :

- (1) 150 (2) 143
(3) 140.55 (4) 123.75

(SSC CGL Prelim Exam. 24.02.2002
(First Sitting)

8. Two numbers are respectively $12\frac{1}{2}\%$ and 25% more than a third number. The first number as percentage of second number is

- (1) 50 (2) 60
(3) 75 (4) 90

(SSC CPO S.I. Exam. 12.01.2003)

9. Which number is 40% less than 90?

- (1) 36 (2) 54
(3) 50 (4) 60

(SSC CPO S.I. Exam. 07.09.2003)

10. Two numbers are less than a third number by 30% and 37% respectively. The per cent by which the second number is less than the first is

- (1) 10% (2) 7%
(3) 4% (4) 3%

(SSC SAS Exam 26.06.2010
(Paper-1)

11. A number when reduced by 10% gives 30. The number is

- (1) $33\frac{1}{2}$ (2) $33\frac{1}{3}$

- (3) 40 (4) 35

(SSC Multi-Tasking Staff

Exam. 17.03.2013, IInd Sitting)

12. How much $66\frac{2}{3}\%$ of Rs. 312 exceeds Rs. 200?

- (1) Rs. 96 (2) Rs. 4

- (3) Rs. 8 (4) Rs. 104

(SSC CHSL (10+2) LDC, DEO
& PA/SA Exam. 15.11.2015
(IInd Sitting) TF No. 7203752)

13. A's income is 25% more than B's income. B's income is what per cent of A's income?

- (1) 80 (2) 75
(3) 50 (4) 25

(SSC CGL Tier-I (CBE)

Exam. 06.09.2016 (1st Sitting)

14. A's salary is 50% more than that of B. Then B's salary is less than that of A by

- (1) 50% (2) $33\frac{1}{3}\%$

- (3) $33\frac{1}{4}\%$ (4) $44\frac{1}{2}\%$

(SSC CGL Tier-I (CBE)

Exam. 07.09.2016 (1st Sitting)

15. If the salary of Manoj is 40% less than that of Subhash, then by how much percentage is the salary of Subhash more than that of Manoj?

- (1) 60% (2) $66\frac{1}{4}\%$

- (3) $66\frac{2}{3}\%$ (4) 65%

(SSC CGL Tier-I (CBE)

Exam. 01.09.2016 (IInd Sitting)

16. The percentage change in a number when it is first decreased by 10% and then increased by 10% is

- (1) 0.1 % increase
(2) 1 % decrease
(3) 0.1 % decrease
(4) No changes

(SSC CGL Tier-I (CBE)

Exam. 01.09.2016 (IIInd Sitting)



PERCENTAGE

17. x is 5 times longer than y . The percentage by which y is less than x is :

(1) 50% (2) 40%
(3) 80% (4) 70%

(SSC CGL Tier-I (CBE)

Exam. 06.09.2016 (IIIrd Sitting)

TYPE-III

1. A person who spends $66\frac{2}{3}\%$ of

his income is able to save ₹ 1,200 per month. His monthly expenses (in ₹) is :

(1) 1,200 (2) 2,400
(3) 3,000 (4) 3,200

(SSC CGL Prelim Exam. 04.07.1999
(First Sitting)

2. The income of C is 20% more than B's and the income of B is 25% more than A's. Find by how much per cent is C's income more than A's ?

(1) 150% (2) 50%
(3) 25% (4) 35%

(SSC CGL Prelim Exam. 04.07.1999
(Second Sitting)

3. If A's income is 40% less than that of B, how much percent B's income is more than that of A?

(1) 60% (2) 40%
(3) 66.66% (4) 33.33%

(SSC CGL Prelim Exam. 27.02.2000
(First Sitting)

4. What per cent decrease in salaries would exactly cancel out the 20 per cent increase?

(1) 20% (2) $16\frac{2}{3}\%$

(3) $33\frac{1}{3}\%$ (4) 18%

(SSC CGL Prelim Exam. 27.02.2000
(Second Sitting)

5. Income of A is 10% more than income of B. Let B's income be $x\%$ less than A's income. Find x .

(1) $9\frac{1}{11}\%$ (2) $10\frac{1}{11}\%$

(3) 11% (4) 10%

(SSC CGL Prelim Exam. 24.02.2002
(Ist Sitting) & 13.11.2005
(IInd Sitting) & (SSC CPO SI
Exam. 12.12.2010 (Paper-I) &
(SSC Investigator Exam. 12.09.2010)

6. If the income of Ram is $12\frac{1}{2}\%$ more than that of Shyam, the income of Shyam is less than that of Ram by

(1) $11\frac{1}{9}\%$ (2) $13\frac{1}{2}\%$

(3) $87\frac{1}{2}\%$ (4) $88\frac{1}{9}\%$

(SSC CGL Prelim Exam. 24.02.2002
(Middle Zone)

7. If 60% of A's income is equal to 75% of B's income, then B's income is equal to $x\%$ of A's income. The value of x is :

(1) 70 (2) 60
(3) 80 (4) 90

(SSC CGL Prelim Exam. 11.05.2003
(First Sitting)

8. 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 ₹ 10080. His income was :

(1) ₹ 50000 (2) ₹ 40000
(3) ₹ 30000 (4) ₹ 20000

(SSC CGL Prelim Exam. 11.05.2003
(First Sitting)

9. Radha spends 40% of her salary on food, 20% on house rent, 10% on entertainment and 10% on conveyance. If her savings at the end of a month are ₹ 1500, then her salary per month (in ₹) is

(1) ₹ 8000 (2) ₹ 7500
(3) ₹ 6000 (4) ₹ 10000

(SSC CGL Prelim Exam. 11.05.2003
(Second Sitting)

10. If the monthly salary of an employee is increased by $2\frac{2}{3}\%$, he gets 72 rupees more. His monthly salary (in rupees) is

(1) 7200 (2) 3600
(3) 2700 (4) 2000

(SSC CPO S.I. Exam. 07.09.2003)

11. If the total monthly income of 16 persons is ₹ 80,800 and the income of one of them is 120% of the average income, then his income is

(1) ₹ 5,050 (2) ₹ 6,060
(3) ₹ 6,160 (4) ₹ 6,600

(SSC Section Officer (Commercial Audit)
Exam. 16.11.2003)

12. Mita's income is 25% more than that of Sita. What percent is Sita's income less than that of Mita ?

(1) 25% (2) 24%

(3) $22\frac{1}{2}\%$ (4) 20%

(SSC CISF ASI Exam 29.08.2010
(Paper-1)

13. A man spends $12\frac{1}{2}\%$ of his salary on items of daily use and

30% of the remainder on house rent. After that he is left with ₹ 2940. How much is his salary ?

(1) ₹ 4800 (2) ₹ 5200
(3) ₹ 4500 (4) ₹ 4000

(SSC CGL Prelim Exam. 08.02.2004
(Second Sitting)

14. The monthly income of a person was ₹ 13,500 and his monthly expenditure was ₹ 9,000. Next year his income increased by 14% and his expenditure increased by 7%. The per cent increase in his savings was

(1) 7% (2) 21%
(3) 28% (4) 35%

(SSC CGL Prelim Exam. 08.02.2004
(IInd Sitting) & (SSC Section
Officer Exam. 25.09.2005)

15. A worker suffers a 20% cut in his wages. He may regain his original wages by obtaining a rise of

(1) 27.5% (2) 25.0%
(3) 22.5% (4) 20.0%

(SSC CPO S.I. Exam. 05.09.2004)

16. Given that 10% of A's income = 15% of B's income = 20% of C's income. If sum of their income is ₹ 7800, then B's income is:

(1) ₹ 3600 (2) ₹ 3000
(3) ₹ 2400 (4) ₹ 1800

(SSC CGL Prelim Exam. 13.11.2005
(First Sitting)

17. If A's income is 25% less than B's income, by how much percent is B's income more than that of A ?

(1) 25% (2) 30%

(3) $33\frac{1}{3}\%$ (4) $66\frac{2}{3}\%$

(SSC CGL Tier-I Exam. 16.05.2010
(Second Sitting)



PERCENTAGE

- 18.** A's salary is 50% more than that of B. How much per cent is B's salary less than that of A?

(1) 50% (2) $33\frac{1}{3}\%$
 (3) 45% (4) $66\frac{2}{3}\%$

(SSC CPO S.I. Exam. 03.09.2006)

- 19.** Tulsiram's salary is 20% more than that of Kashyap. If Tulsiram saves ₹ 720 which is 4% of his salary, then Kashyap's salary is
- (1) ₹ 15,000 (2) ₹ 12,000
 (3) ₹ 10,000 (4) ₹ 22,000

(SSC CPO S.I. Exam. 06.09.2009)

- 20.** A's salary is 40% of B's salary and B's salary is 25% of C's salary. What percentage of C's salary is A's salary?

(1) 5% (2) 10%
 (3) 15% (4) 20%

(SSC CISF ASI Exam. 29.08.2010
 (Paper-1))

- 21.** If A's income is 50% less than that of B's, then B's income is what per cent more than that of A?

(1) 125% (2) 100%
 (3) 75% (4) 50%

(SSC CGL Tier-I Exam. 16.05.2010
 (First Sitting))

- 22.** X's income is 20% more than that of Y. What per cent is Y's income less than X?

(1) $83\frac{1}{3}\%$ (2) $16\frac{2}{3}\%$
 (3) $83\frac{2}{3}\%$ (4) $16\frac{1}{3}\%$

(SSC CGL Prelim Exam. 24.02.2002
 (IInd Sitting) & (SSC HSL DEO & LDC Exam. 27.11.2010))

- 23.** The allowances of an employee constitutes 165% of his basic pay. If he receives ₹ 11925 as gross salary, then his basic pay is (in ₹):

(1) 4000 (2) 5000
 (3) 4500 (4) 5500

(FCI Assistant Grade-III
 Exam. 05.02.2012 (Paper-I)
 East Zone (IInd Sitting))

- 24.** If Nita's salary is 25 per cent more than Papiya's salary, then the percentage by which Papiya's salary is less than Nita's salary is

(1) 15% (2) 20%
 (3) 25% (4) 32%

(SSC Section Officer (Commercial
 Audit) Exam. 26.11.2006
 (Second Sitting))

- 25.** The salary of a person is decreased by 25% and then the decreased salary is increased by 25%. His new salary in comparison with his original salary is

(1) the same (2) 6.25% more
 (3) 6.25% less (4) 0.625% less

(SSC Data Entry Operator
 Exam. 02.08.2009)

- 26.** Ram saves 14% of his salary while Shyam saves 22%. If both get the same salary and Shyam saves ₹ 1540, what is the savings of Ram?

(1) ₹ 990 (2) ₹ 980
 (3) ₹ 890 (4) ₹ 880

(SSC CHSL DEO & LDC
 Exam. 28.11.2010 (Ist Sitting))

- 27.** A's salary is 25% more than B's salary. B's salary is how much less than A's salary?

(1) 20% (2) 24%
 (3) 25% (4) 27.5%

(SSC Section officer commercial
 Audit Exam. 16.11.2003 & SSC
 CPO S.I. Exam. 12.01.2003) &
 (SSC CHSL DEO & LDC Exam.
 28.11.2010 (Ist Sitting))

- 28.** A man spends 75% of his income. His income increased by 20% and he increased his expenditure by 15%. His savings will then be increased by

(1) 33% (2) $33\frac{1}{3}\%$
 (3) 35% (4) 40%

(SSC CHSL DEO & LDC
 Exam. 04.12.2011 (IInd Sitting
 (North Zone)))

- 29.** Nitin's salary was reduced by 10% and then the reduced salary was increased by 10%. His new salary in comparison with his original salary is

(1) the same (2) 1% more
 (3) 1% less (4) 5% less

(SSC Data Entry Operator
 Exam. 31.08.2008)

- 30.** A man spends 40% of his monthly salary on food and one-third of the remaining on transport. If he saves ₹ 4,500 per month, which is equal to half the balance after spending on food and transport, his monthly salary is

(1) ₹ 11,250 (2) ₹ 22,500
 (3) ₹ 25,000 (4) ₹ 45,000

(SSC Data Entry Operator
 Exam. 31.08.2008)

- 31.** A saves 20% of his monthly salary. If his monthly expenditure is ₹ 6,000, then his monthly savings is

(1) ₹ 1,500 (2) ₹ 1,800
 (3) ₹ 1,200 (4) ₹ 4,800

(SSC CHSL DEO & LDC Exam.
 21.10.2012 (IInd Sitting))

- 32.** A's salary is increased by 10% and then decreased by 10%. Then, change in salary is

(1) 0% (2) 1% decrease
 (3) 1% increase (4) 2% decrease

(SSC CHSL DEO & LDC Exam.
 04.11.2012 (IInd Sitting))

- 33.** Kishan spends 30% of his salary on food and donates 3% in a Charitable Trust. He spends ₹ 2,310 on these two items, then total salary for that month is

(1) ₹ 6,000 (2) ₹ 8,000
 (3) ₹ 9,000 (4) ₹ 7,000

(SSC CHSL DEO & LDC Exam.
 04.11.2012 (IInd Sitting))

- 34.** A clerk received an annual salary of ₹ 3,660 in the year 1975. This was 20% more than his salary in 1974. What was his salary in 1974?

(1) ₹ 3,005 (2) ₹ 3,000
 (3) ₹ 3,500 (4) ₹ 3,050

(SSC FCI Assistant Grade-III Main
 Exam. 07.04.2013)

- 35.** Out of his total income, Mr. Kapur spends 20% on house rent and 70% of the rest on house-hold expenses. If he saves ₹ 1,800, what is his total income (in rupees)?

(1) ₹ 7,800 (2) ₹ 7,000
 (3) ₹ 8,000 (4) ₹ 7,500

(SSC FCI Assistant Grade-III Main
 Exam. 07.04.2013)

- 36.** Arbind spends 75% of his income and saves the rest. His income is increased by 20% and he increases his expenditure by 10%. Then the increase in savings in percentage is

(1) 55% (2) 52%
 (3) 50% (4) 48%

(SSC CHSL DEO & LDC Exam.
 27.10.2013 (IInd Sitting))

- 37.** The enhanced salary of a man becomes ₹ 24,000 after 20% increment. His previous salary was

(1) ₹ 20,000 (2) ₹ 21,000
 (3) ₹ 16,000 (4) ₹ 18,000

(SSC Multi-Tasking Staff
 Exam. 17.03.2013, Ist Sitting)



PERCENTAGE

- 38.** The salary of a person was reduced by 10%. By what per cent should his reduced salary be raised so as to bring it at par with his original salary ?

(1) 9% (2) $11\frac{1}{9}\%$

(3) $9\frac{1}{11}\%$ (4) 11%

(SSC CGL Prelim Exam. 08.02.2004 (First Sitting))

- 39.** If A's salary is 50% more than that of B, then B's salary is less than A's by

(1) 33% (2) $40\frac{1}{3}\%$

(3) $45\frac{1}{3}\%$ (4) $33\frac{1}{3}\%$

(SSC CGL Tier-I Exam. 19.10.2014 (1st Sitting))

- 40.** Mr. X spends 35% of his salary on food and 5% of his salary on children education. In January 2011, he spent ₹ 17,600 on these two items. His salary for that month is

(1) ₹ 40,000 (2) ₹ 44,000

(3) ₹ 48,000 (4) ₹ 46,000

(SSC CHSL DEO & LDC Exam. 02.11.2014 (IInd Sitting))

- 41.** The monthly salaries of A and B together amount to Rs. 40,000. A spends 85% of his salary and B, 95% of his salary. If now their savings are the same, then the salary (in Rs.) of A is

(1) Rs. 10,000 (2) Rs. 12,000

(3) Rs. 16,000 (4) Rs. 18,000

(SSC CGL Tier-I Exam. 19.10.2014 TF No. 022 MH 3)

- 42.** 25% of annual salary of A is equal to eighty percent of annual salary of B. Monthly salary of B is 40% of the monthly salary of C. Annual salary of C is Rs. 6 lac. What is the monthly salary of A ?

(1) Rs. 60,000 (2) Rs. 62,000

(3) Rs. 64,000 (4) Rs. 56,000

(SSC CGL Tier-II Exam, 2014 12.04.2015 (Kolkata Region) TF No. 789 TH 7)

- 43.** Two numbers are less than a third number by 30% and 37% respectively. How much percent is the second number less than the first ?

(1) 10 (2) 4

(3) 3 (4) 7

(SSC CGL Tier-II Exam, 2014 12.04.2015 (Kolkata Region) TF No. 789 TH 7)

- 44.** A man spends 75% of his income. His income is increased by 20% and he increased his expenditure by 10%. His savings are increased by

(1) $37\frac{1}{2}\%$ (2) 50%

(3) 25% (4) 10%

(SSC CGL Tier-I Exam, 09.08.2015 (IInd Sitting) TF No. 4239378)

- 45.** Ram babu donated 3% of his income to a charity and deposited 12% of the rest in bank. If now he has Rs. 12804, then his income was :

(1) Rs. 17460 (2) Rs. 15000

(3) Rs. 7500 (4) Rs. 14550

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 06.12.2015 (1st Sitting) TF No. 1375232)

- 46.** Mukesh has twice as much money as Soham. Soham has 50% more money than Pankaj. If the average money with them is Rs. 110, then Mukesh has

(1) Rs. 155 (2) Rs. 160

(3) Rs. 180 (4) Rs. 175

(SSC CGL Tier-II Online Exam.01.12.2016)

- 47.** A man spends 75% of his income. His income increases by 20% and his expenditure also increases by 10%. Find the percentage increase in his savings.

(1) 25% (2) 50%

(3) 15% (4) 10%

(SSC CGL Tier-II Online Exam.01.12.2016)

- 48.** Christy donated 10% of his income to an orphanage and deposited 20% of the remainder in his bank. If he has now Rs. 7200 left, what is his income.

(1) Rs. 10000 (2) Rs. 8000

(3) Rs. 9000 (4) Rs. 8500

(SSC CPO Exam. 06.06.2016 (1st Sitting))

- 49.** The average salary of male employees in a firm was Rs. 5200 and that of females was Rs. 4200. The mean salary of all the employees was Rs. 5000. What is the percentage of female employees?

(1) 80% (2) 20%

(3) 40% (4) 30%

(SSC CGL Tier-I (CBE) Exam. 09.09.2016 (1st Sitting))

- 50.** In a factory, the salary of each worker is increased in the ratio 22 : 25 but the number of workers is decreased by $26\frac{2}{3}\%$.

The net effect on the salary is

(1) $11\frac{1}{9}\%$ decrease

(2) 20% increase

(3) $16\frac{2}{3}\%$ decrease

(4) 10% decrease

(SSC CAPFs (CPO) SI & ASI, Delhi Police Exam. 20.03.2016 (IInd Sitting))

- 51.** If the income of Mohan is 150% higher than that of Mahesh, then by what percent the income of Mahesh is less than that of Mohan ?

(1) 40% (2) 50%

(3) 60% (4) 45%

(SSC CGL Tier-I (CBE) Exam. 30.08.2016 (1st Sitting))

- 52.** A man spends 60% of his income on different items. His income is increased by 20% and his expenditure is also increased by 10%. Find the percentage decrease in his savings?

(1) 10% (2) 15%

(3) 20% (4) 25%

(SSC CGL Tier-I (CBE) Exam. 02.09.2016 (IInd Sitting))

- 53.** P's salary is 25% higher than Q, what percentage is Q's salary lower than that of P ?

(1) 20 (2) 29

(3) 31 (4) $33\frac{1}{3}$

(SSC CGL Tier-I (CBE) Exam. 28.08.2016 (1st Sitting))

- 54.** If A's salary is 40% less than that of B, then how much percent is B's salary more than that of A?

(1) $33\frac{1}{3}$ (2) $66\frac{2}{3}$

(3) $33\frac{2}{3}$ (4) $66\frac{1}{3}$

(SSC CGL Tier-I (CBE) Exam. 30.08.2016 (IIIrd Sitting))



PERCENTAGE

55. A's salary was decreased by 50% and subsequently increased by 50%. How much per cent does he lose?

(1) 25% (2) 50%

(3) $12\frac{1}{2}\%$ (4) No loss

(SSC CGL Tier-I (CBE)

Exam. 08.09.2016 (IIIrd Sitting)

56. A man spends 15% of his income. If his expenditure is Rs. 75, his income (in rupees) is :

(1) 400 (2) 300

(3) 750 (4) 500

(SSC CGL Tier-I (CBE)

Exam. 09.09.2016 (IIIrd Sitting)

57. If A's salary is 30% more than that of B, then by how much per cent is B's salary less than that of A ?

(1) 13.01% (2) 13.07%

(3) 23.07% (4) 23.01%

(SSC CGL Tier-I (CBE)

Exam. 27.10.2016 (Ist Sitting)

58. The average monthly salary of all the employees in a factory is Rs. 8840. If the average salary of all the officers is Rs. 15000 and that of the remaining employees is Rs. 8000, then what is the percentage of the officers among the employees?

(1) 10% (2) 12%

(3) $8\frac{1}{3}\%$ (4) 11%

(SSC CGL Tier-II (CBE)

Exam. 12.01.2017)

59. The monthly salary of Mr. Sachdev gets increased by 5%, thereby his salary becomes ₹ 15,120 per annum. His earlier monthly salary (before the increase) was

(1) ₹ 1,320 (2) ₹ 1,200

(3) ₹ 1,240 (4) ₹ 1,440

(SSC Multi-Tasking Staff

Exam. 30.04.2017)

TYPE-IV

1. If A exceeds B by 40%, B is less than C by 20%, then A : C is :

(1) 28 : 25 (2) 26 : 25

(3) 3 : 2 (4) 3 : 1

(SSC CGL Prelim Exam. 04.07.1999

(Ist Sitting) & (SSC Section

Officer Exam. 16.11.2003)

2. If 10% of m is the same as 20% of n, then m : n is equal to :

(1) 2 : 1 (2) 1 : 2

(3) 1 : 10 (4) 1 : 20

(SSC CGL Prelim Exam. 27.02.2000

(First Sitting)

3. The ratio 5 : 4 expressed as a per cent equals :

(1) 125% (2) 80%

(3) 40% (4) 12.5%

(SSC CGL Prelim Exam. 27.02.2000

(First Sitting)

4. The ratio of the number of boys and girls in a college is 3 : 2. If 20% of boys and 25% of girls are adults, the percentage of those students who are not adults, is

(1) 58% (2) 67.5%

(3) 78% (4) 82.5%

(SSC CGL Prelim Exam. 24.02.2002

(Middle Zone) & (SSC DEO

Exam. 02.08.2009)

5. The ratio of the number of boys to that of girls in a school is 4 : 1. If 75% of boys and 70% of the girls are scholarship-holders, then the percentage of students who do not get scholarship is

(1) 50% (2) 28%

(3) 75% (4) 26%

(SSC CGL Prelim Exam. 11.05.2003

(Second Sitting)

6. Two numbers are in the ratio 2 : 3. If 20% of the smaller number added to 20 is equal to the sum of 10% of the larger number and 25, then the smaller number is

(1) 100 (2) 160

(3) 180 (4) 200

(SSC Section Officer (Commercial Audit)

Exam. 16.11.2003)

7. Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is

(1) 2 : 5 (2) 3 : 5

(3) 4 : 5 (4) 6 : 7

(SSC Section Officer (Commercial

Audit) Exam. 16.11.2003 & CPO SI

Exam. 26.05.2005) & (SSC CGL

Exam. 13.11.2005 (First Sitting)

8. The difference of two numbers is 45% of their sum. The ratio of the larger number to the smaller number is

(1) 20 : 9 (2) 9 : 20

(3) 29 : 11 (4) 11 : 29

(SSC CGL Prelim Exam. 08.02.2004

(Second Sitting) & (SSC CGL Exam.

27.07.2008 (IInd Sitting) & (SSC

HSL DEO & LDC Exam. 27.11.2010) &

(SSC CGL Tier-I Exam. 26.06.2011

(Ist Sitting) & (SSC MTS

Exam. 10.03.2013 (Patna)

9. If 30% of A = 0.25 of B = $\frac{1}{5}$ of C, then A : B : C is equal to :

(1) 5 : 6 : 4 (2) 5 : 24 : 5

(3) 6 : 5 : 4 (4) 10 : 12 : 15

(SSC CGL Prelim Exam. 08.02.2004

(First Sitting)

10. In a class, the number of girls is 20% more than that of the boys. The strength of the class is 66. If 4 more girls are admitted to the class, the ratio of the number of boys to that of the girls is

(1) 1 : 2 (2) 3 : 4

(3) 1 : 4 (4) 3 : 5

(SSC CGL Prelim Exam. 13.11.2005

(Second Sitting)

11. The ratio of the number of boys and girls in a school is 3 : 2. If 20% of the boys and 30% of the girls are scholarship holders, then the percentage of students, who do not get scholarship, is

(1) 50% (2) 72%

(3) 75% (4) 76%

(SSC CGL Prelim Exam. 04.02.2007

(First Sitting)

12. The expenses on rice, fish and oil of a family are in the ratio 12 : 17 : 3. The prices of these articles are increased by 20%, 30% and 50% respectively. The total expenses of family on these articles are increased by

(1) $14\frac{1}{8}\%$ (2) $7\frac{1}{8}\%$

(3) $56\frac{1}{8}\%$ (4) $28\frac{1}{8}\%$

(SSC CGL Prelim Exam. 04.02.2007

(First Sitting)

13. If 20% of A = 30% of B = $\frac{1}{6}$ of C,

then A : B : C is

(1) 2 : 3 : 16

(2) 3 : 2 : 16

(3) 10 : 15 : 18

(4) 15 : 10 : 18

(SSC CGL Prelim Exam. 04.02.2007

(First Sitting)

14. The bus fare and train fare of a place from Kolkata were ₹ 20 and ₹ 30 respectively. Train fare has been increased by 20% and the bus fare has been increased by 10%. The ratio of new train fare to new bus fare is

(1) 11 : 18 (2) 18 : 11

(3) 5 : 3 (4) 3 : 5

(SSC CGL Prelim Exam. 04.02.2007

(First Sitting)

15. The difference of two numbers is 15% of their sum. The ratio of the larger number to the smaller number is

(1) 23 : 17 (2) 11 : 9

(3) 17 : 11 (4) 23 : 11

(SSC CGL Prelim Exam. 04.02.2007

(Second Sitting)



PERCENTAGE

- 16.** The price of sugar is increased by 20%. If the expenditure on sugar has to be kept the same as earlier, the ratio between the reduction in consumption and the original consumption is
 (1) 1 : 3 (2) 1 : 4
 (3) 1 : 6 (4) 1 : 5
 (SSC CGL Prelim Exam. 04.02.2007 (Second Sitting))
- 17.** Rama's expenditures and savings are in the ratio 5 : 3. If her income increases by 12% and expenditure by 15%, then by how much per cent do her savings increase ?
 (1) 12% (2) 7%
 (3) 8% (4) 13%
 (SSC CGL Prelim Exam. 27.07.2008 (First Sitting))
- 18.** The ratio of two numbers is 4:5 when the first is increased by 20% and the second is decreased by 20%, the ratio of the resulting numbers is
 (1) 4 : 5 (2) 5 : 4
 (3) 5 : 6 (4) 6 : 5
 (SSC CPO S.I. Exam. 09.11.2008)
- 19.** If 60% of A = $\frac{3}{4}$ of B, then A : B is
 (1) 9 : 20 (2) 20 : 9
 (3) 4 : 5 (4) 5 : 4
 (SSC CGL Tier-I Exam. 16.05.2010 (First Sitting))
- 20.** If A exceeds B by 60% and B is less than C by 20%, then A : C is
 (1) 32 : 25 (2) 25 : 32
 (3) 8 : 5 (4) 4 : 5
 (SSC CISF ASI Exam. 29.08.2010 (Paper-1))
- 21.** If 30% of (B - A) = 18% of (B + A), then the ratio A : B is equal to
 (1) 4 : 1 (2) 1 : 4
 (3) 5 : 4 (4) 5 : 9
 (SSC CPO S.I. Exam. 12.12.2010 (Paper-I))
- 22.** The ratio of the number of boys and girls in a school is 3 : 2. If 20% of the boys and 25% of the girls are scholarship holders, then the percentage of the students, who do not get the scholarship, is :
 (1) 78% (2) 75%
 (3) 60% (4) 55%
 (SSC CHSL DEO & LDC Exam. 27.11.2010)
- 23.** When 60% of a number is subtracted from another number, the second number reduces to its 52%; the ratio of the first number to the second number is :
 (1) 6 : 5 (2) 5 : 3
 (3) 5 : 4 (4) 4 : 5
 (SSC CHSL DEO & LDC Exam. 11.12.2011 (IInd Sitting (Delhi Zone)))
- 24.** The population of a town is 3,11,250. The ratio between women and men is 43 : 40. If there are 24% literate among men and 8% literate among women, the total number of literate persons in the town is
 (1) 41,800 (2) 48,900
 (3) 56,800 (4) 99,600
 (SSC Graduate Level Tier-II Exam. 16.09.2012)
- 25.** The prices of a school bag and a shoe are in the ratio 7 : 5. The price of a school bag is ₹ 200 more than the price of a shoe. Then the price of a shoe is
 (1) ₹ 200 (2) ₹ 700
 (3) ₹ 500 (4) ₹ 1,200
 (SSC Graduate Level Tier-I Exam. 19.05.2013 1st Sitting)
- 26.** If 15% of x is same as 20 % of y then x : y is
 (1) 4 : 3 (2) 5 : 4
 (3) 6 : 5 (4) 3 : 4
 (SSC CGL Tier-I Re-Exam. (2013) 27.04.2014)
- 27.** The ratio of the number of boys and girls in a school is 2 : 3. If 25% of the boys and 30% of the girls are scholarship holders, the percentage of the school students who are not scholarship holders is
 (1) 72 (2) 36
 (3) 54 (4) 60
 (SSC CGL Tier-I Re-Exam. (2013) 20.07.2014 (IInd Sitting))
- 28.** Two numbers A and B are such that the sum of 5% of A and 4% of B is $\frac{2}{3}$ rd of the sum of 6% of A and 8% of B. The ratio A : B is
 (1) 4 : 3 (2) 3 : 4
 (3) 1 : 1 (4) 2 : 3
 (SSC CGL Tier-I Exam. 19.10.2014)
- 29.** In what ratio must 25% hydrochloric acid be mixed with 60% hydrochloric acid to get a mixture of 40% hydrochloric acid ?
 (1) 5 : 12 (2) 4 : 3
 (3) 3 : 4 (4) 12 : 5
 (SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014 , 1st Sitting TF No. 333 LO 2)
- 30.** If 50% of x = 30% y, then x : y is
 (1) 2 : 3 (2) 5 : 3
 (3) 3 : 2 (4) 3 : 5
 (SSC CGL Tier-II Exam. 12.04.2015 TF No. 567 TL 9)
- 31.** The ratio of the number of boys to that of girls in a village is 3 : 2. If 30% of boys and 70% of girls appeared in an examination, the ratio of the number of villagers, appeared in the examination to that not appeared in the same examination is
 (1) 9 : 14 (2) 23 : 27
 (3) 1 : 1 (4) 27 : 23
 (SSC CAPFs SI, CISF ASI & Delhi Police SI Exam, 21.06.2015 IInd Sitting)
- 32.** A milkman mixed some water with milk to gain 25% by selling the mixture at the cost price. The ratio of water and milk is respectively
 (1) 5 : 4 (2) 4 : 5
 (3) 1 : 5 (4) 1 : 4
 (SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 15.11.2015 (1st Sitting) TF No. 6636838)
- 33.** The ratio of syrup and water in a mixture is 3 : 1, then the percentage of syrup in this mixture is :
 (1) 75% (2) 25%
 (3) $66\frac{2}{3}\%$ (4) $33\frac{1}{3}\%$
 (SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 15.11.2015 (IInd Sitting) TF No. 7203752)
- 34.** There is a ratio of 5: 4 between two numbers. If 40 % of the first number is 12, then what would be 50 % of the second number?
 (1) 12 (2) 24
 (3) 18
 (4) Data Inadequate
 (SSC CPO SI, ASI Online Exam.05.06.2016) (IInd Sitting)
- 35.** If 10% of x is 3 times 15% of y, then find x : y.
 (1) 7 : 2 (2) 9 : 2
 (3) 8 : 3 (4) 11 : 4
 (SSC CGL Tier-I (CBE) Exam. 27.08.2016) (IInd Sitting)
- 36.** The ratio between Ram's age and Rahim's age is 10:11. What is the age of Rahim in percentage of Ram's age ?
 (1) $109\frac{1}{11}\%$ (2) 110%
 (3) $111\frac{1}{9}\%$ (4) 111%
 (SSC CGL Tier-I (CBE) Exam. 01.09.2016) (1st Sitting)



PERCENTAGE

- 37.** The ratio of the number of boys and girls in a school is 3:2. If 20% of the boys and 25% of the girls are scholarship holders, the percentage of the school students who are not scholarship holders is

(1) 56 (2) 78
(3) 70 (4) 80

(SSC CGL Tier-II (CBE)
Exam. 30.11.2016)

- 38.** If 35% of A's income is equal to 25% of B's income, then the ratio of A's income to B's income is

(1) 7 : 5 (2) 5 : 7
(3) 4 : 7 (4) 4 : 3

(SSC CGL Tier-I (CBE)
Exam. 09.09.2016 (IInd Sitting))

TYPE-V

- 1.** A sample of 50 litres of glycerine is found to be adulterated to the extent of 20%. How much pure glycerine should be added to it so as to bring down the percentage of impurity to 5% ?

(1) 155 litres (2) 150 litres
(3) 150.4 litres (4) 149 litres

(SSC CGL Prelim Exam. 08.02.2004
(Second Sitting))

- 2.** 1 litre of water is added to 5 litres of alcohol-water solution containing 40% alcohol strength. The strength of alcohol in the new solution will be

(1) 30% (2) 33%

(3) $33\frac{2}{3}\%$ (4) $33\frac{1}{3}\%$

(SSC CGL Prelim Exam. 04.02.2007
(First Sitting))

- 3.** If 4 litres of water is evaporated on boiling from 12 litres of salt solution containing 7 percentage salt, the percentage of salt in the remaining solution is

(1) 10.5% (2) 11.5%
(3) 12% (4) 13%

(SSC CPO S.I. Exam. 06.09.2009)

- 4.** A vessel has 60 litres of solution of acid and water having 80% acid. How much water be added to make it a solution in which acid forms 60% ?

(1) 48 litres (2) 20 litres
(3) 36 litres
(4) None of these

(SSC CHSL DEO & LDC Exam.
04.12.2011 (1st Sitting (North Zone))

- 5.** 75 gm of sugar solution has 30% sugar in it. Then the quantity of sugar that should be added to the solution to make the quantity of the sugar 70% in the solution, is

(1) 125 gm (2) 100 gm
(3) 120 gm (4) 130 gm

(SSC CHSL DEO & LDC
Exam. 04.12.2011
(IInd Sitting (East Zone))

- 6.** A litre of pure alcohol is added to 6 litres of 30% alcohol solution. The percentage of water in the solution is

(1) 50% (2) 65%
(3) 60% (4) 40%

(SSC CHSL DEO & LDC Exam. 11.12.2011
(1st Sitting (Delhi Zone))

- 7.** An ore contains 25% of an alloy that has 90% iron. Other than this, in the remaining 75% of the ore, there is no iron. To obtain 60 kg of pure iron, the quantity of the ore needed (in kgs) is approximately :

(1) 250.57 (2) 266.67
(3) 275.23 (4) 300

(SSC CHSL DEO & LDC
Exam. 11.12.2011
(IInd Sitting (Delhi Zone))

- 8.** How much water must be added to 100 ml of 80 per cent solution of boric acid to reduce it to a 50 per cent solution ?

(1) 30 ml (2) 40 ml
(3) 50 ml (4) 60 ml

(SSC CHSL DEO & LDC
Exam. 11.12.2011
(1st Sitting (East Zone))

- 9.** In one litre of a mixture of alcohol and water, water is 30%. The amount of alcohol that must be added to the mixture so that the part of water in the mixture becomes 15% is :

(1) 1000 ml (2) 700 ml
(3) 300 ml (4) 900 ml

(SSC CHSL DEO & LDC
Exam. 11.12.2011
(IInd Sitting (East Zone))

- 10.** One type of liquid contains 20% water and the second type of liquid contains 35% of water. A glass is filled with 10 parts of first liquid and 4 parts of second liquid. The water in the new mixture in the glass is

(1) 37% (2) 46%

(3) $12\frac{1}{7}\%$ (4) $24\frac{2}{7}\%$

(SSC CHSL DEO & LDC Exam.
10.11.2013, IInd Sitting)

- 11.** 40 litres of a mixture of milk and water contains 10% of water, the water to be added, to make the water content 20% in the new mixture is :

(1) 6 litres (2) 6.5 litres
(3) 5.5 litres (4) 5 litres

(SSC CGL Prelim Exam. 11.05.2003
(1st Sitting) & (HSL DEO LDC
Exam. 28.11.2010)

- 12.** How much pure alcohol has to be added to 400 ml of a solution containing 15% of alcohol to change the concentration of alcohol in the mixture to 32% ?

(1) 60 ml (2) 100 ml
(3) 128 ml (4) 68 ml

(SSC CGL Prelim Exam.
11.05.2003 (Second Sitting))

- 13.** In 50 gm alloy of gold and silver, the gold is 80% by weight. How much gold should be mixed to this alloy so that the weight of gold would become 95% ?

(1) 200 gm (2) 150 gm
(3) 50 gm (4) 10 gm

(SSC Section Officer (Commercial
Audit) Exam. 25.09.2005)

- 14.** 200 litres of a mixture contains 15% water and the rest is milk. The amount of milk that must be added so that the resulting mixture contains 87.5% milk is

(1) 30 litres (2) 35 litres
(3) 40 litres (4) 45 litres

(SSC Section Officer (Commercial
Audit) Exam. 30.09.2007
(Second Sitting))

- 15.** In what ratio must a mixture of 30% alcohol strength be mixed with that of 50% alcohol strength so as to get a mixture of 45% alcohol strength ?

(1) 1 : 2 (2) 1 : 3
(3) 2 : 1 (4) 3 : 1

(SSC CGL Prelim Exam.
27.07.2008 (First Sitting))

- 16.** The ratio in which two sugar solutions of the concentrations 15% and 40% are to be mixed to get a solution of concentration 30% is

(1) 2 : 3 (2) 3 : 2
(3) 8 : 9 (4) 9 : 8

(SSC CGL Prelim Exam.
27.07.2008 (Second Sitting))

- 17.** 15 litres of a mixture contains alcohol and water in the ratio 1 : 4. If 3 litres of Water is mixed in it, the percentage of alcohol in the new mixture will be

(1) 15% (2) $16\frac{2}{3}\%$

(3) 17% (4) $18\frac{1}{2}\%$

(SSC Graduate Level Tier-I
Exam. 21.04.2013)



PERCENTAGE

- 18.** In an alloy there is 12% of copper. To get 69 kg of copper, how much alloy will be required ?

(1) 424 kg (2) 575 kg
 (3) 828 kg (4) $1736\frac{2}{3}$ kg

(SSC CGL Prelim Exam.
24.02.2002 (Middle Zone))

- 19.** In what ratio must 25% of alcohol be mixed with 50% of alcohol to get a mixture of 40% strength alcohol ?

(1) 1 : 2 (2) 2 : 1
 (3) 2 : 3 (4) 3 : 2

(SSC CGL Tier-I Re-Exam. (2013)
20.07.2014 (1st Sitting))

- 20.** 20 litres of a mixture contains 20% alcohol and the rest water. If 4 litres of water be mixed in it, the percentage of alcohol in the new mixture will be

(1) $33\frac{1}{3}\%$ (2) $16\frac{2}{3}\%$
 (3) 25% (4) $12\frac{1}{2}\%$

(SSC CGL Tier-II Exam. 21.09.2014)

- 21.** 300 grams of sugar solution has 40% of sugar in it. How much sugar should be added to make it 50% in the solution?

(1) 40 gram (2) 10 gram
 (3) 60 gram (4) 80 gram

(SSC CGL Tier-II Exam,
25.10.2015, TF No. 1099685)

- 22.** A sugar solution of 3 litre contain 60% sugar. One liter of water is added to this solution. Then the percentage of sugar in the new solution is:

(1) 30 (2) 45
 (3) 50 (4) 60

(SSC CPO SI, ASI Online
Exam.05.06.2016) (IInd Sitting))

- 23.** 8 litres of water is added to 32 litres of a solution containing 20% of alcohol in water. What is the approximate concentration of alcohol in the solution now ?

(1) 24% (2) 16%
 (3) 8% (4) 12%

(SSC CPO SI & ASI, Online
Exam. 06.06.2016) (IInd Sitting))

TYPE-VI

- 1.** Price of sugar rises by 20%. By how much percent should the consumption of sugar be reduced so that the expenditure does not change?

(1) 20% (2) 10%

(3) $16\frac{2}{3}\%$ (4) 15%

(SSC CGL Prelim Exam. 04.07.1999
(1st Sitting) & (SSC CGL Tier-I
Exam. 19.06.2011 (1st Sitting))

- 2.** If food prices go up by 10%, by how much should a man reduce his consumption so as not to increase his expenditure?

(1) $9\frac{1}{11}\%$ (2) 10%

(3) $11\frac{1}{9}\%$

(4) The data is not sufficient

(SSC CGL Prelim Exam. 27.02.2000
(Second Sitting))

- 3.** In the new budget, the price of kerosene oil rose by 25%. By how much per cent must a person reduce his consumption of kerosene oil so that his expenditure on it does not increase ?

(1) 20% (2) 25%
 (3) 50% (4) 40%

(SSC CGL Prelim Exam. 24.02.2002
(IInd Sitting) & (SSC CGL
Exam. 13.11.2005 (IInd Sitting))

- 4.** If the price of tea is increased by 20%, by how much per cent the consumption of tea be reduced so that there is no increase in the expenditure on it ?

(1) $83\frac{1}{3}\%$ (2) 20%

(3) $16\frac{2}{3}\%$ (4) $8\frac{1}{3}\%$

(SSC CPO S.I. Exam. 05.09.2004)

- 5.** If the price of a commodity is decreased by 20% and its consumption is increased by 20%, what will be the increase or decrease in the expenditure on the commodity ?

(1) 4% increase (2) 4% decrease
 (3) 8% decrease (4) 8% increase

(SSC CPO S.I. Exam. 16.12.2007)

- 6.** The price of a certain item is increased by 15%. If a consumer wants to keep his expenditure on the item the same as before, how much per cent must he reduce

his consumption of that item ?

(1) 15% (2) $13\frac{1}{23}\%$

(3) $16\frac{2}{3}\%$ (4) $10\frac{20}{23}\%$

(SSC CGL Prelim Exam. 04.02.2007
(First Sitting))

- 7.** If the price of a commodity is increased by 50%, by what fraction must its consumption be reduced so as to keep the same expenditure on its consumption ?

(1) $\frac{1}{4}$ (2) $\frac{1}{3}$

(3) $\frac{1}{2}$ (4) $\frac{2}{3}$

(SSC CGL Prelim Exam. 27.07.2008
(First Sitting))

- 8.** If the price of rice be raised by 25%, the percent by which a house-holder must reduce his consumption of rice so as not to increase his expenditure on rice is

(1) 22.5% (2) 25.75%
 (3) 25% (4) 20%

(SSC Multi-Tasking Staff
Exam. 17.03.2013, 1st Sitting)

- 9.** If the duty on an article is reduced by 40% of its present rate, by how much per cent must its consumption increase in order that the revenue remains unaltered ?

(1) 60% (2) $62\frac{1}{3}\%$

(3) 72% (4) $66\frac{2}{3}\%$

(SSC CPO S.I. Exam. 09.11.2008)

- 10.** Price of milk has increased by 20%. To keep the expenditure unchanged, the present consumption is to be reduced by :

(1) 20% (2) 18%

(3) 10% (4) $16\frac{2}{3}\%$

(SSC Multi-Tasking Staff
Exam. 10.03.2013)

- 11.** The price of a commodity rises from ₹ 6 per kg to ₹ 7.50 per kg. If the expenditure cannot increase, the percentage of reduction in consumption is

(1) 15% (2) 20%
 (3) 25% (4) 30%

(SSC CGL Tier-1 Exam 19.06.2011
(Second Sitting))



PERCENTAGE

12. Water tax is increased by 20% but its consumption is decreased by 20%. Then the increase or decrease in the expenditure of the money is

(1) 5% decrease (2) 4% decrease
(3) No change (4) 4% increase

(SSC CGL Tier-II Exam, 25.10.2015, TF No. 1099685)

13. Price of a commodity has increased by 60%. By what per cent must a consumer reduce the consumption of the commodity so as not to increase the expenditure ?

(1) 37% (2) 37.5%
(3) 40.5% (4) 60%

(SSC CGL Tier-1 Exam 26.06.2011 (Second Sitting))

14. The price of petrol is increased by 25%. By how much per cent a car owner should reduce his consumption of petrol so that the expenditure on petrol would not be increased ?

(1) 25% (2) 30%
(3) 50% (4) 20%

(SSC Section Officer (Commercial Audit) Exam. 25.09.2005)

15. If the price of petrol be raised by 20%, then the percentage by which a car owner must reduce his consumption so as not to increase his expenditure on petrol is

(1) $16\frac{1}{3}\%$ (2) $16\frac{2}{3}\%$

(3) $15\frac{2}{3}\%$ (4) $15\frac{1}{3}\%$

(SSC Section Officer (Commercial Audit) Exam. 30.09.2007 (Second Sitting))

TYPE-VII

1. In an examination, there were 1000 boys and 800 girls. 60% of the boys and 50% of the girls passed. Find the percent of the candidates failed ?

(1) 46.4% (2) 48.4%
(3) 44.4% (4) 49.6%

(SSC CGL Prelim Exam. 04.07.1999 (First Sitting))

2. In an examination, a student who gets 20% of the maximum marks fails by 5 marks. Another student who scores 30% of the maximum marks gets 20 marks more than the pass marks. The necessary percentage required for passing is :

(1) 32% (2) 23%
(3) 22% (4) 20%

(SSC CGL Prelim Exam. 27.02.2000 (First Sitting))

3. In an examination a candidate must secure 40% marks to pass. A candidate, who gets 220 marks, fails by 20 marks. What are the maximum marks for the examination?

(1) 1200 (2) 800
(3) 600 (4) 450

(SSC CGL Prelim Exam. 27.02.2000 (Second Sitting))

4. A student has to obtain 33% of total marks to pass. He got 25% of total marks and failed by 40 marks. The number of total marks is

(1) 800 (2) 300
(3) 500 (4) 1000

(SSC CPO S.I. Exam. 12.01.2003)

5. Two students appeared at an examination. One of them secured 9 marks more than the other and his marks were 56% of the sum of their marks. The marks obtained by them are :

(1) 42, 33 (2) 43, 34
(3) 41, 32 (4) 39, 30

(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting))

6. In the annual examination Mahuya got 10% less marks than Supriyo in Mathematics. Mahuya got 81 marks. The marks of Supriyo are

(1) 90 (2) 87
(3) 88 (4) 89

(SSC CHSL DEO & LDC Exam. 20.10.2013)

7. A student has to secure 40% marks to pass. He gets 90 marks and fails by 10 marks. Maximum marks are :

(1) 200 (2) 225
(3) 250 (4) 275

(SSC CPO S.I. Exam. 26.05.2005)

8. In an examination, 65% of the students passed in Mathematics, 48% passed in Physics and 30% passed in both. How much per cent of students failed in both the subjects ?

(1) 17% (2) 43%
(3) 13% (4) 47%

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting))

9. 72% of the students of a certain class took Biology and 44% took Mathematics. If each student took at least one subject from Biology or Mathematics and 40 took both, then the total number of students in the class is :

(1) 200 (2) 240
(3) 250 (4) 320

(SSC CPO S.I. Exam. 16.12.2007)

10. In an examination, a student had to obtain 33% of the maximum marks to pass. He got 125 marks and failed by 40 marks. The maximum marks were

(1) 500 (2) 600
(3) 800 (4) 1000

(SSC CPO S.I.

Exam 12.12.2010 (Paper-I))

11. For an examination it is required to get 36 % of maximum marks to pass. A student got 113 marks and failed by 85 marks. The maximum marks for the examination are :

(1) 500 (2) 550
(3) 565 (4) 620

(SSC CHSL DEO & LDC

Exam. 28.11.2010 (1st Sitting))

12. A student scored 32% marks in science subjects out of 300. How much should he score in language papers out of 200 if he is to get overall 46% marks ?

(1) 72% (2) 67%
(3) 66% (4) 60%

(SSC CHSL DEO & LDC

Exam. 28.11.2010 (IInd Sitting))

13. In an examination in which full marks were 500, A got 10% less than B. B got 25% more than C. C got 20% less than D. If A got 360 marks, what percentage of full marks was obtained by D ?

(1) 90% (2) 80%
(3) 50% (4) 60%

(SSC CHSL DEO & LDC Exam.

04.12.2011 (IInd Sitting (East Zone))

14. In an examination, 1100 boys and 900 girls appeared. 50% of the boys and 40% of the girls passed the examination. The percentage of candidates who failed

(1) 45% (2) 45.5%
(3) 50% (4) 54.5%

(SSC Multi-Tasking (Non-Technical)

Staff Exam. 22.02.2011)

15. In an examination 80% of the boys passed in English and 85% passed in Mathematics, while 75% passed in both. If 45 boys failed in both, the number of boys who sat for the examination was

(1) 400 (2) 450
(3) 200 (4) 150

(SSC CPO SI Exam. 09.11.2008)

& (SSC Constable (GD)

Exam. 12.05.2013)



PERCENTAGE

- 16.** In a class 60% of the student pass in Hindi and 45% pass in Sanskrit. If 25% of them pass in atleast one subject, what percentage of the students fail in both the subjects ?

(1) 80% (2) 75%
(3) 20% (4) 25%

(SSC CGL Prelim Exam. 27.02.2000
(First Sitting)

- 17.** In an examination 60% of the students pass in English, 70% pass in Hindi and 40% pass in both. What percent of students fail in both English and Hindi?

(1) 10% (2) 20%
(3) 25% (4) 30%

(SSC CGL Prelim Exam. 27.02.2000
(Second Sitting)

- 18.** In an examination 70% of the candidates passed in English. 80% passed in Mathematics. 10% failed in both the subjects. If 144 candidates passed in both, the total number of candidates were :

(1) 125 (2) 200
(3) 240 (4) 375

(SSC CGL Prelim Exam. 11.05.2003
(First Sitting)

- 19.** A candidate who gets 20% marks in an examination fails by 30 marks but another candidate who gets 32% gets 42 marks more than the passing marks. Then the percentage of pass marks is :

(1) 52% (2) 50%
(3) 33% (4) 25%

(SSC CGL Prelim Exam. 11.05.2003
(First Sitting)

- 20.** In an examination there were 640 boys and 360 girls. 60% of boys and 80% of girls were successful. The percentage of failure was :

(1) 20% (2) 60%
(3) 30.5% (4) 32.8%

(SSC CGL Prelim Exam. 11.05.2003
(First Sitting)

- 21.** In an examination 34% failed in Mathematics and 42% failed in English. If 20% failed in both the subjects, the percentage of students who passed in both subjects was

(1) 54% (2) 50%
(3) 44% (4) 56%

(SSC CGL Prelim Exam. 11.05.2003
(Second Sitting)

- 22.** A candidate secured 30% marks in an examination and failed by 6 marks. Another secured 40% marks and got 6 marks more than the bare minimum to pass. The maximum marks are

(1) 150 (2) 120
(3) 100 (4) 180

(SSC CGL Prelim Exam. 11.05.2003
(Second Sitting)

- 23.** In an examination, 52% students failed in Hindi and 42% in English. If 17% failed in both the subjects, what percentage of students passed in both the subjects ?

(1) 38% (2) 33%
(3) 23% (4) 18%

(SSC CGL Prelim Exam. 08.02.2004
(1st Sitting) & (SSC SAS Exam.
26.06.2010 (Paper-I) & (SSC GL
Tier-II Exam. 16.09.2012)

- 24.** In a group of students, 70% can speak English and 65% can speak Hindi. If 27% of the students can speak none of the two languages, then what per cent of the group can speak both the languages ?

(1) 38% (2) 62%
(3) 28% (4) 23%

(SSC CGL Prelim Exam. 08.02.2004
(Second Sitting)

- 25.** 25% of the candidates who appeared in an examination failed to qualify and only 450 candidates qualified. The number of candidates, who appeared in the examination, was

(1) 700 (2) 600
(3) 550 (4) 500

(SSC CPO S.I. Exam. 05.09.2004)

- 26.** In two successive years 100 and 75 students of a school appeared at the final examination. Respectively, 75% and 60% of them passed. The average rate of pass is

(1) $68\frac{4}{7}\%$ (2) 78%

(3) $80\frac{1}{2}\%$ (4) 80%

(SSC CPO S.I. Exam. 03.09.2006)

- 27.** A student has to secure minimum 35% marks to pass in an examination. If he gets 200 marks and fails by 10 marks, then the maximum marks are

(1) 300 (2) 400
(3) 500 (4) 600

(SSC CPO S.I. Exam. 03.09.2006)

- 28.** A candidate who scores 30 per cent fails by 5 marks, while another candidate who scores 40 per cent marks gets 10 more than minimum pass marks. The minimum marks required to pass are

(1) 50 (2) 70
(3) 100 (4) 150

(SSC Section Officer (Commercial Audit)
Exam. 26.11.2006 (Second
Sitting)

- 29.** In an examination, 60% of the candidates passed in English and 70% of the candidates passed in Mathematics, but 20% failed in both of these subjects. If 2500 candidates passed in both the subjects, the number of candidates who appeared at the examination was

(1) 3000 (2) 3500
(3) 4000 (4) 5000

(SSC CGL Prelim Exam. 04.02.2007
(First Sitting)

- 30.** In a test a student got 30% marks and failed by 25 marks. In the same test another student got 40% marks and secured 25 marks more than the essential minimum pass marks. The maximum marks for the test were

(1) 400 (2) 480
(3) 500 (4) 580

(SSC Section Officer (Commercial Audit)
Exam. 30.09.2007 (Second
Sitting)

- 31.** In an examination 80% candidates passed in English and 85% candidates passed in Mathematics. If 73% candidates passed in both these subjects, then what per cent of candidates failed in both the subjects ?

(1) 8% (2) 15%
(3) 27% (4) 35%

(SSC CGL Prelim Exam. 27.07.2008
(First Sitting)

- 32.** In an examination, 35% of the candidates failed in Mathematics and 25% in English. If 10% failed in both Mathematics and English, then how much percent of candidates passed in both the subjects ?

(1) 50% (2) 55%
(3) 57% (4) 60%

(SSC CGL Prelim Exam. 27.07.2008
(Second Sitting)

PERCENTAGE

- 33.** In an examination, 93% of students passed and 259 failed. The total number of students appearing at the examination was

(1) 3700 (2) 3850
(3) 3950 (4) 4200

(SSC CISF ASI Exam. 29.08.2010
(Paper-1))

- 34.** 90% of the students in a school passed in English, 85% passed in Mathematics and 150 students passed in both the subjects. If no student failed in both the subjects, find the total number of students.

(1) 120 (2) 220
(3) 200 (4) 300

(SSC Graduate Level Tier-I
Exam. 11.11.2012 (1st Sitting))

- 35.** Three sets of 40, 50 and 60 students appeared for an examination and the pass percentage was 100, 90 and 80 respectively. The pass percentage of the whole set is

(1) $88\frac{2}{3}\%$ (2) $84\frac{2}{3}\%$

(3) $88\frac{1}{3}\%$ (4) $84\frac{1}{3}\%$

(SSC Graduate Level Tier-II
Exam. 29.09.2013)

- 36.** In an examination A got 25% marks more than B, B got 10% less than C and C got 25% more than D. If D got 320 marks out of 500, the marks obtained by A were

(1) 405 (2) 450
(3) 360 (4) 400

(SSC Graduate Level Tier-II
Exam. 29.09.2013)

- 37.** In two successive years, 80 and 60 students of a school appeared at the final examination of which 60% and 80% passed respectively. The average rate of students passed (in percent) is

(1) 68% (2) $68\frac{4}{7}\%$

(3) 70% (4) $72\frac{3}{7}\%$

(SSC CGL Tier-I Exam.
19.10.2014 (1st Sitting))

- 38.** In an examination, 19% students fail in Mathematics and 10% students fail in English. If 7% of all students fail in both subjects, then the number of students passed in both subjects is

- (1) 36 % of all students
(2) 64% of all students
(3) 71% of all students
(4) 78% of all students

(SSC CHSL DEO & LDC Exam.
02.11.2014 (IInd Sitting))

- 39.** A class has two sections, which contain 20 and 30 students. The pass percentage of these sections are 80% and 60% respectively. The pass percentage of whole class is

(1) 60 (2) 68
(3) 70 (4) 78

(SSC CHSL DEO Exam. 02.11.2014
(1st Sitting))

- 40.** In an examination 75% candidates passed in English and 60% passed in Mathematics. 25% failed in both and 240 passed the examination. Find the total number of candidates.

(1) 492 (2) 300
(3) 500 (4) 400

(SSC CAPFs SI, CISF ASI & Delhi
Police SI Exam. 22.06.2014
TF No. 999 KP0)

- 41.** In a quarterly examination a student secured 30% marks and failed by 12 marks. In the same examination another student secured 40% marks and got 28 marks more than minimum marks to pass. The maximum marks in the examination is

(1) 300 (2) 500
(3) 700 (4) 400

(SSC CHSL (10+2) DEO & LDC
Exam. 16.11.2014, IInd Sitting
TF No. 545 QP 6)

- 42.** In an examination there are three subjects of 100 marks each. A student scores 60% in the first subject and 80% in the second subject. He scored 70% in aggregate. His percentage of marks in the third subject is

(1) 80 (2) 60
(3) 65 (4) 70

(SSC CAPFs SI, CISF ASI & Delhi
Police SI Exam, 21.06.2015
IInd Sitting)

- 43.** In an examination, a student must get 36% marks to pass. A student who gets 190 marks failed by 35 marks. The total marks in that examination is

(1) 450 (2) 810
(3) 500 (4) 625

(SSC CGL Tier-I Exam, 16.08.2015
(1st Sitting) TF No. 3196279)

- 44.** A candidate who gets 20% marks in an examination, fails by 30 marks. But if he gets 32% marks, he gets 42 marks more than the minimum pass marks. Find the pass percentage of marks.

(1) 52% (2) 20%
(3) 25% (4) 12%

(SSC CHSL (10+2) LDC, DEO
& PA/SA Exam, 15.11.2015
(IInd Sitting) TF No. 7203752)

- 45.** In an examination 73% of the candidates passed in quantitative aptitude test, 70% passed in General awareness and 64% passed in both. If 6300 failed in both subjects the total number of examinees was

(1) 60000 (2) 50000
(3) 30000 (4) 25000

(SSC CGL Tier-II Online
Exam.01.12.2016)

- 46.** In a certain school, 10% of the students have less than 75% attendance and are not allowed to sit in the exam, but 20% of the students who have less than 75% attendance are allowed to sit in the exam. What percent of the students in the school have less than 75% attendance ?

(1) 30% (2) 12.5%
(3) 15% (4) 10.5%

(SSC CPO Exam. 06.06.2016)
(1st Sitting)

- 47.** There are 1400 students in a school, 25% of them wear spectacles and $\frac{2}{7}$ of them wearing

spectacles are boys. How many girls in the school do wear spectacles ?

(1) 250 (2) 100
(3) 200 (4) 300

(SSC CGL Tier-I (CBE)
Exam. 27.08.2016) (1st Sitting)

- 48.** If 60% of the students in a school are boys and the number of girls is 812, how many boys are there in the school?

(1) 1128 (2) 1218
(3) 1821 (4) 1281

(SSC CGL Tier-I (CBE)
Exam. 02.09.2016) (1st Sitting)

- 49.** A scored 72% in a paper with a maximum marks of 900 and 80% in another paper with a maximum marks of 700. If the result is based on the combined percentage of two papers, the combined percentage is

(1) 75.5% (2) 76%
(3) 76.5% (4) 77%

(SSC CGL Tier-II (CBE)
Exam. 30.11.2016)



PERCENTAGE

- 50.** In an examination, 35% of total students failed in Hindi, 45% failed in English and 20% failed in both. Find the percentage of those students who passed in both the subjects ?

(1) 45% (2) 35%
(3) 20% (4) 40%

(SSC CGL Tier-I (CBE)

Exam. 31.08.2016 (IIIrd Sitting)

- 51.** The average marks obtained in a class of 50 students is 70%. The average of first 25 is 60% and that of 24 is 80%. What is the marks obtained by the last student?

(1) 90% (2) 60%
(3) 80% (4) 70%

(SSC CGL Tier-I (CBE)

Exam. 09.09.2016 (IIIrd Sitting)

- 52.** Two students appeared for an examination. One of them secured 9 marks more than the other and his marks were 56% of the sum of their marks. The marks obtained by them are

(1) 40 and 31 (2) 72 and 63
(3) 42 and 33 (4) 68 and 59

(SSC CHSL (10+2) Tier-I (CBE)

Exam. 15.01.2017 (IIInd Sitting)

- 53.** An engineering student has to secure 25% marks to pass. He gets 47 and fails by 43 marks. What are the maximum marks of the examination ?

(1) 385 marks (2) 410 marks
(3) 360 marks (4) 435 marks

(SSC CHSL (10+2) Tier-I (CBE)

Exam. 16.01.2017 (IIInd Sitting)

- 54.** An examinee has to secure 40% marks to pass an examination. He secures 180 marks and fails by an equal number of marks. The total number of marks in the examination is

(1) 900 (2) 1000
(3) 1050 (4) 800

(SSC Multi-Tasking Staff

Exam. 30.04.2017)

TYPE-VIII

- 1.** Salary of a person is first increased by 20%, then it is decreased by 20%. Percentage change in his salary is :

(1) 4% decreased
(2) 4% increased
(3) 8% decreased
(4) 20% increased

(SSC CGL Prelim Exam. 24.02.2002

(First Sitting)

- 2.** A number is increased by 20% and then it is decreased by 10%. Find the net increase or decrease per cent.

(1) 10% increase
(2) 10% decrease
(3) 8% increase
(4) 8% decrease

(SSC CGL Prelim Exam. 24.02.2002

(Second Sitting)

- 3.** The tax imposed on an article is decreased by 10% and its consumption increases by 10%. Find the percentage change in revenue from it.

(1) 10% increase (2) 2% decrease
(3) 1% decrease (4) 11% increase

(SSC CGL Prelim Exam. 24.02.2002

(Middle Zone)

- 4.** The price of an article was decreased by 10% and again reduced by 10%. By what per cent should the price have been reduced once, in order to produce the same effect as these two successive reductions ?

(1) 15% (2) 19%
(3) 20% (4) 25%

(SSC CPO S.I. Exam. 12.01.2003

- 5.** If price of a book is first decreased by 25% and then increased by 20%, the net change in the price of the book will be

(1) 10% decrease
(2) 5% decrease
(3) no change
(4) 5% increase

(SSC CGL Prelim Exam. 11.05.2003

(Second Sitting)

- 6.** The price of an article is reduced by 25% but the daily sale of the article is increased by 30%. The net effect on the daily sale receipts is

(1) $2\frac{1}{2}\%$ increase

(2) $2\frac{1}{2}\%$ decrease

(3) 2 % increase

(4) 2% decrease

(SSC CGL Prelim Exam. 27.07.2008

(Second Sitting)

- 7.** Two successive price increases of 10% and 10% of an article are equivalent to a single price increase of

(1) 19% (2) 20%
(3) 21% (4) 22%

(SSC CGL Tier-I Exam. 16.05.2010

(First Sitting)

- 8.** The price of an article was first increased by 10% and then again by 20%. If the last increased price be ₹ 33, the original price was

(1) ₹ 30 (2) ₹ 27.50

(3) ₹ 26.50 (4) ₹ 25

(SSC CGL Tier-I Exam. 16.05.2010

(Second Sitting)

- 9.** If a number is increased by 20% and the resulting number is again increased by 20%, what per cent is the total increase ?

(1) 48% (2) 44%
(3) 41% (4) 40%

(SSC SAS Exam 26.06.2010 (Paper-

1)

- 10.** A number is increased by 10% and then it is decreased by 10%. The net change in the number is

(1) no increase or decrease

(2) 2% decrease

(3) 1% increase

(4) 1% decrease

(SSC CGL Prelim Exam. 11.05.2003

(Ist Sitting) & (SSC (South Zone)

Investigator Exam. 12.09.2010) &

CHSL DEO & LDC Exam. 04.11.2012)

- 11.** A number is first increased by 10% and then it is further increased by 20%. The original number is increased altogether by

(1) 30% (2) 15%

(3) 32% (4) 36%

(SSC CGL Exam. 04.02.2007

(Ist Sitting) & (FCI Assistant Grade-III

Exam. 25.02.2012 (Paper-I)

North Zone (Ist Sitting)

- 12.** When the price of an article was reduced by 20% its sale increased by 80%. What was the net effect on the sale?

(1) 44% increase

(2) 44% decrease

(3) 66% increase

(4) 75% increase

(SSC CGL Tier-I Exam 19.06.2011

(First Sitting)

- 13.** The length of a rectangle is increased by 10% and breadth decreased by 10% Then the area of the new rectangle is

(1) neither decreased nor increased

(2) increased by 1%

(3) decreased by 1%

(4) decreased by 10%

(SSC CGL Prelim Exam. 04.02.2007

(First Sitting)

- 14.** When the price of cloth was reduced by 25%, the quantity of cloth sold increased by 20%. What was the effect on gross receipt of the shop?

(1) 5% increase (2) 5% decrease

(3) 10% increase (4) 10% decrease

(SSC Multi-Tasking (Non-Technical)

Staff Exam. 20.02.2011)



PERCENTAGE

- 15.** The cost of an article worth ₹ 100 is increased by 10% first and again increased by 10%. The total increase in rupees is
 (1) 20 (2) 21
 (3) 110 (4) 121

(SSC Multi-Tasking (Non-Technical) Staff Exam. 27.02.2011)

- 16.** The numerator of a fraction is increased by 20% and denominator is decreased by 20%. The value of the fraction becomes $\frac{4}{5}$.

The original fraction is

- (1) $\frac{2}{3}$ (2) $\frac{8}{15}$
 (3) $\frac{7}{11}$ (4) $\frac{4}{5}$

(SSC Delhi Police S.I. (SI) Exam. 19.08.2012)

- 17.** If the numerator of a fraction is increased by 20% and the denominator is decreased by 5%, the value of the new fraction becomes $\frac{5}{2}$. The original fraction is

- (1) $\frac{24}{19}$ (2) $\frac{3}{18}$
 (3) $\frac{95}{48}$ (4) $\frac{48}{95}$

(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting))

- 18.** If a number is increased by 25% and the resulting number is decreased by 25%, then the percentage increase or decrease finally is
 (1) no change

(2) decreased by $6\frac{1}{4}\%$

(3) increased by $6\frac{1}{4}\%$

(4) increased by 6%

(SSC CHSL DEO & LDC Exam. 10.11.2013, 1st Sitting)

- 19.** The sum of two numbers is 520. If the bigger number is decreased by 4% and the smaller number is increased by 12%, then the numbers obtained are equal. The smaller number is
 (1) 280 (2) 210
 (3) 240 (4) 300

(SSC CHSL DEO & LDC Exam. 27.10.2013 IIInd Sitting)

- 20.** The price of an article is first decreased by 20% and then increased by 30%. If the resulting price is ₹ 416, the original price of the article is

- (1) ₹ 350 (2) ₹ 405
 (3) ₹ 400 (4) ₹ 450

(SSC Graduate Level Tier-I Exam. 19.05.2013)

- 21.** A number increased by $22\frac{1}{2}\%$ gives 98. The number is

- (1) 45 (2) 18
 (3) 80 (4) 81

(SSC Graduate Level Tier-II Exam. 29.09.2013)

- 22.** The price of an article is decreased by 10%. To restore its former value the new price must be increased by :

- (1) 10% (2) 11%
 (3) $9\frac{1}{11}\%$ (4) $11\frac{1}{9}\%$

(SSC CGL Prelim Exam. 27.02.2000 (First Sitting))

- 23.** A number reduced by 25% becomes 225. What per cent should it be increased so that it becomes 375?

- (1) 25% (2) 30%
 (3) 35% (4) 75%

(SSC CPO S.I. Exam. 05.09.2004)

- 24.** A number is increased by 20% and then again by 20%. By what per cent should the increased number be reduced so as to get back the original number ?

- (1) $30\frac{5}{9}\%$ (2) $19\frac{11}{31}\%$

- (3) 40% (4) 44%

(SSC CGL Prelim Exam. 08.02.2004) (First Sitting)

- 25.** The number of employees working in a farm is increased by 25% and the wages per head are decreased by 25%. If it results in x % decrease in total wages, then the value of x is

- (1) 0% (2) 25%

- (3) 20% (4) $\frac{25}{4}\%$

(SSC CGL Prelim Exam. 08.02.2004) (Second Sitting)

- 26.** A number is first decreased by 10% and then increased by 10%. The number so obtained is 50 less than the original number. The original number is

- (1) 5900 (2) 5000
 (3) 5500 (4) 5050

(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting))

- 27.** If the income tax is increased by 19%, the net income is reduced by 1%. The rate of income tax is
 (1) 6% (2) 4%
 (3) 5% (4) 7.2%

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting))

- 28.** A man spends 75% of his income. His income increases by 20% and his expenditure also increases by 10%. The percentage of increase in his savings is

- (1) 40% (2) 30%
 (3) 50% (4) 25%

(SSC CGL Tier-I Exam. 19.10.2014)

- 29.** If each side of a cube is increased by 10% the volume of the cube will increase by

- (1) 30% (2) 10%
 (3) 33.1% (4) 25%

(SSC CGL Tier-II Exam. 21.09.2014)

- 30.** The strength of a school increases and decreases in every alternate year by 10%. It started with increase in 2000. Then the strength of the school in 2003 as compared to that in 2000 was

- (1) increased by 8.9%
 (2) decreased by 8.9%
 (3) increased by 9.8%
 (4) decreased by 9.8%

(SSC CGL Tier-II Exam. 21.09.2014)

- 31.** The difference between the value of the number increased by 20% and the value of the number decreased by 25% is 36. Find the number.

- (1) 7.2 (2) 0.8
 (3) 720 (4) 80

(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 22.06.2014)

- 32.** A number is first decreased by 20%. The decreased number is then increased by 20%. The resulting number is less than the original number by 20. Then the original number is

- (1) 200 (2) 400
 (3) 500 (4) 600

(SSC CHSL DEO Exam. 02.11.2014 (1st Sitting))



PERCENTAGE

33. A number is increased by $x\%$; to get back to the original number, it is to be reduced by

(1) $x\%$ (2) $\frac{100x}{100+x}\%$

(3) $\frac{10x}{100+x}\%$ (4) $\frac{x}{100+x}\%$

(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam, 21.06.2015 (1st Sitting) (TF No. 8037731))

34. A number is decreased by 10% and the resulting number is again decreased by 20%. What is the final percentage of decrease?

- (1) 25% (2) 26%
(3) 27% (4) 28%

(SSC CGL Tier-I (CBE)

Exam.11.09.2016) (1st Sitting)

35. The price of an edible oil is increased by 25%. To maintain the budget, Sushma reduces the consumption of this oil by 20%. The increase in expenditure due to this edible oil is:

- (1) 0 (2) 1
(3) 2 (4) 3

(SSC CPO SI, ASI Online Exam.05.06.2016) (IInd Sitting)

TYPE-IX

1. 8% of the voters in an election did not cast their votes. In this election, there were only two candidates. The winner by obtaining 48% of the total votes defeated his contestant by 1100 votes. The total number of voters in the election was :

- (1) 21000 (2) 23500
(3) 22000 (4) 27500

(SSC CGL Prelim Exam. 11.05.2003 (First Sitting))

2. In an election between two candidates, 75% of the voters cast their votes, out of which 2% votes were declared invalid. A candidate got 9261 votes which were 75% of the valid votes. The total number of voters enrolled in that election was

- (1) 16000 (2) 16400
(3) 16800 (4) 18000

(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting))

3. In an election between two candidates, the candidate getting 60% of the votes polled, is elected by a majority of 14,000 votes. The number of votes polled by the winning candidate is

- (1) 28,000 (2) 32,000
(3) 42,000 (4) 46,000

(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting))

4. In an office 40% of the staff is female, 40% of the females and 60% of the males voted for me. The percentage of votes I got was

- (1) 24% (2) 42%
(3) 50% (4) 52%

(SSC Multi-Tasking (Non-Technical)

Staff Exam. 27.02.2011)

5. In an election there were only two candidates. One of the candidates secured 40% of votes and is defeated by the other candidate by 298 votes. The total number of votes polled is

- (1) 745 (2) 1460
(3) 1490 (4) 1500

(SSC Graduate Level Tier-II

Exam.16.09.2012)

6. In an assembly election, a candidate got 55% of the total valid votes. 2% of the total votes were declared invalid. If the total number of voters is 104000, then the number of valid votes polled in favour of the candidate is:

- (1) 56506 (2) 56650
(3) 56560 (4) 56056

(SSC CHSL DEO & LDC Exam.

21.10.2012 (IInd Sitting))

7. Two candidates contested in an election. One got 60% of the votes and won by 1600 votes. What is the number of votes polled ?

- (1) 9000 (2) 8000
(3) 10000 (4) 7500

(SSC CHSL DEO & LDC Exam.

21.10.2012 (IInd Sitting))

8. In an election, three candidates contested. The first candidate got 40% votes and the second got 36% votes. If total number of votes polled were 36000, find the number of votes got by the 3rd candidate.

- (1) 8040 (2) 8640
(3) 9360 (4) 9640

(SSC Constable (GD)

Exam. 12.05.2013 1st Sitting)

9. Two persons contested an election of Parliament. The winning candidate secured 57% of the total votes polled and won by a majority of 42,000 votes. The number of total votes polled is

- (1) 5,00,000 (2) 6,00,000
(3) 3,00,000 (4) 4,00,000

(SSC Multi-Tasking Staff

Exam. 17.03.2013, IInd Sitting)

10. In an election, a candidate who gets 84 % of the votes is elected by a majority of 476 votes. What is the total number of votes polled ?

- (1) 900 (2) 810

- (3) 600 (4) 700

(SSC CGL Tier-I Exam. 26.10.2014)

11. At an election there were two candidates. A candidate got 38% of votes and lost by 7200 number of votes. The total number of valid votes were

- (1) 13000 (2) 13800

- (3) 16200 (4) 30000

(SSC CHSL DEO Exam. 16.11.2014

(1st Sitting))

12. In a college election a candidate secured 62% of the votes and is elected by a margin of 144 votes. The total number of votes polled is :

- (1) 925 (2) 600

- (3) 1200 (4) 800

(SSC Constable (GD)

Exam, 04.10.2015, 1st Sitting)

13. In an election 10% of the voters on the voters' list did not cast their votes and 60 voters cast their ballot papers blank. There were only two candidates. The winner was supported by 47% of all the voters in the list and he got 308 votes more than his rival. The number of voters on the list was

- (1) 3600 (2) 6200

- (3) 4575 (4) 6028

(SSC CPO SI, ASI Online

Exam.05.06.2016) (IInd Sitting))

14. In an election, a candidate secures 40% of the votes but is defeated by the only other candidate by a majority of 298 votes. Find the total number of votes recorded.

- (1) 1580 (2) 1490

- (3) 1470 (4) 1530

(SSC CGL Tier-I (CBE)

Exam. 02.09.2016) (IInd Sitting))



PERCENTAGE

TYPE-X

1. The present population of a city is 180000. If it increases at the rate of 10% per annum, its population after 2 years will be :
(1) 207800 (2) 227800
(3) 217800 (4) 237800
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting))

2. The value of an equipment depreciates by 20% each year. How much less will the value of the equipment be after 3 years ?
(1) 48.8% (2) 51.2%
(3) 54% (4) 60%
(SSC CISF ASI Exam. 29.08.2010 (Paper-1))

3. A district has 64000 inhabitants. If the population increases at the rate of $2\frac{1}{2}\%$ per annum, the number of inhabitants at the end of 3 years will be
(1) 70000 (2) 69200
(3) 68921 (4) 68911
(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting))

4. The value of a property depreciates every year by 10% of its value at the beginning of the year. The present value of the property is ₹ 8100. What was its value 2 years ago ?
(1) ₹ 10,000
(2) ₹ $\left(\frac{90}{100}\right)^2 \times 8100$
(3) ₹ $\left(\frac{100}{110}\right)^2 \times 8100$
(4) ₹ 9801
(SSC CPO S.I. Exam. 07.09.2003)

5. The population of a town 2 years ago was 62,500. Due to migration to big cities, it decreases every year at the rate of 4%. The present population of the town is:
(1) 57,600 (2) 56,700
(3) 76,000 (4) 75,000
(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting))

6. The population of a town increases every year by 4%. If its present population is 50,000, then after 2 years it will be
(1) 53,900 (2) 54,000
(3) 54,080 (4) 54,900
(SSC CGL Prelim Exam. 27.07.2008 (First Sitting))

7. A man received ₹ 8,80,000 as his annual salary of the year 2007 which was 10% more than his annual salary in 2006. His annual salary in the year 2006 was
(1) ₹ 4,80,000 (2) ₹ 8,00,000
(3) ₹ 4,00,000 (4) ₹ 8,40,000
(SSC Data Entry Operator Exam. 02.08.2009)

8. Present population of a village is 67600. It has been increasing annually at the rate of 4%. What was the population of the village two years ago ?
(1) 62500 (2) 63000
(3) 64756 (4) 65200
(SSC CHSL DEO & LDC Exam. 27.11.2010)

9. The value of a machine depreciates by 5% every year. If its present value is ₹ 2,00,000, its value after 2 years will be
(1) ₹ 1,80,500 (2) ₹ 1,99,000
(3) ₹ 1,80,000 (4) ₹ 2,10,000
(SSC Constable (GD) & Rifleman (GD) Exam. 22.04.2012 (1st Sitting))

10. The value of a property decreases every year at the rate of 5%. If its present value is ₹ 4,11,540, what was its value 3 years ago ?
(1) ₹ 4,50,000 (2) ₹ 4,60,000
(3) ₹ 4,75,000 (4) ₹ 4,80,000
(SSC CHSL DEO & LDC Exam. 28.11.2010 (IInd Sitting))

11. If the population of a town is 64000 and its annual increase is 10%, then its correct population at the end of 3 years will be :
(1) 80000 (2) 85184
(3) 85000 (4) 85100
(SSC CHSL DEO & LDC Exam. 21.10.2012 (IInd Sitting))

12. The population of a village decreases at the rate of 20% per annum. If its population 2 years ago was 10,000, the present population is
(1) 4600 (2) 6400
(3) 7600 (4) 6000
(SSC CHSL DEO & LDC Exam. 04.11.2012 (IInd Sitting))

13. If a man receives on one-fourth of his capital 3% interest, on two third 5% and on the remainder 11%, the percentage he receives on the whole is
(1) 4.5 (2) 5
(3) 5.5 (4) 5.2
(SSC CHSL DEO & LDC Exam. 04.11.2012, IInd Sitting)

14. The value of a machine is ₹ 6,250. It decreases by 10% during the first year, 20% during the second year and 30% during the third year. What will be the value of the machine after 3 years?
(1) ₹ 2,650 (2) ₹ 3,050
(3) ₹ 3,150 (4) ₹ 3,510
(SSC Multi-Tasking Staff Exam. 24.03.2013, 1st Sitting)

15. The value of a machine depreciates every year by 10%. If its present value is ₹ 50,000 then the value of the machine after 2 years is _____.
(1) ₹ 40,050 (2) ₹ 45,000
(3) ₹ 40,005 (4) ₹ 40,500
(SSC Graduate Level Tier-I Exam. 21.04.2013, 1st Sitting)

16. The value of a machine depreciates every year at the rate of 10% on its value at the beginning of that year. If the current value of the machine is ₹ 729, its worth 3 years ago was:
(1) ₹ 1000 (2) ₹ 750.87
(3) ₹ 947.10 (4) ₹ 800
(SSC Graduate Level Tier-I Exam. 21.04.2013)

17. Raman's salary is increased by 5% this year. If his present salary is ₹ 1,806, the last year's salary was
(1) ₹ 1720 (2) ₹ 1620
(3) ₹ 1520 (4) ₹ 1801
(SSC Constable (GD) Exam. 12.05.2013)

18. In a town, the population was 8000. In one year, male population increased by 10% and female population increased by 8% but the total population increased by 9%. The number of males in the town was :
(1) 4000 (2) 4500
(3) 5000 (4) 6000
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting))

19. The population of a village was 9800. In a year, with the increase in population of males by 8% and that of females by 5%, the population of the village became 10458. What was the number of males in the village before increase ?
(1) 4200 (2) 4410
(3) 5600 (4) 6048
(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting))



PERCENTAGE

- 20.** The population of a village has increased annually at the rate of 25%. If at the end of 3 years it is 10,000, the population in the beginning of the first year was
 (1) 5120 (2) 5000
 (3) 4900 (4) 4500
 (SSC CPO S.I. Exam. 07.09.2003)
- 21.** If population of women in a village is 90% of population of men, what is the population of men as a percentage of population of women?
 (1) 100% (2) 105%
 (3) 108% (4) 111%
 (SSC CISF Constable (GD) Exam. 05.06.2011)
- 22.** The population of a town increases each year by 4% of its total at the beginning of the year. If the population on 1st January 2001 was 500000, what was it on 1st January, 2004?
 (1) 562432 (2) 652432
 (3) 465223 (4) 564232
 (SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 22.06.2014)
- 23.** The population of a village increases by 5% annually. If its present population is 4410, then its population 2 years ago was
 (1) 4500 (2) 4000
 (3) 3800 (4) 3500
 (SSC CHSL DEO & LDC Exam. 9.11.2014)
- 24.** A TV was bought at a price of ₹ 21,000. After one year the value of TV was depreciated by 5%. Find the value of the TV after one year.
 (1) ₹ 19,950 (2) ₹ 20,950
 (3) ₹ 18,950 (4) ₹ 17,950
 (SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014, IInd Sitting TF No. 545 QP 6)
- 25.** From 1980-1990, the population of a country increased by 20%. From 1990-2000, the population of the country increased by 20%. From 2000-2010, the population of the country increased by 20%. Then the overall increased population (in percentage) of the country from 1980-2010 was
 (1) 72.2 % (2) 60 %
 (3) 72.8 % (4) 62.8 %
 (SSC CGL Tier-II Exam. 12.04.2015 TF No. 567 TL 9)

- 26.** Of the 1000 inhabitants in a town 60% are males of whom 20% are literate. If of all the inhabitants, 25% are literate, then what percentage of the females of the town are illiterate?
 (1) 27.5 (2) 32.5
 (3) 37.5 (4) 22.5
 (SSC CGL Tier-II Exam, 2014 12.04.2015 (Kolkata Region) TF No. 789 TH 7)
- 27.** In a factory, the production of cycles rose to 48, 400 from 40,000 in 2 years. The rate of growth per annum is
 (1) 9% (2) 8%
 (3) 10.5% (4) 10%
 (SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 21.06.2015 (Ist Sitting) TF No. 8037731)
- 28.** The present price of a scooter is Rs. 7,290. If its value decreases every year by 10%, then its value 3 years back was
 (1) Rs. 10, 500 (2) Rs. 8,000
 (3) Rs. 10,000 (4) Rs. 11,500
 (SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 21.06.2015 IInd Sitting)
- 29.** The population of a town increases by 5% every year. If the present population is 9261, the population 3 years ago was
 (1) 8000 (2) 5700
 (3) 6000 (4) 7500
 (SSC CGL Tier-I Exam, 09.08.2015 (Ist Sitting) TF No. 1443088)
- 30.** An epidemic broke out in a village in which 5% of the population died. Of the remaining, 20% fled out of panic. If the present population is 4655, then the population of the village originally was
 (1) 6000 (2) 6125
 (3) 5955 (4) 5995
 (SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 01.11.2015, IInd Sitting)
- 31.** The population of a town is 9000. If the number of females increases by 5% and the males by 7.5%, what will be the total population after increase. The number of females currently is 3000.
 (1) 9600 (2) 9200
 (3) 10500 (4) 9540
 (SSC CAPFs (CPO) SI & ASI, Delhi Police Exam. 05.06.2016 (Ist Sitting))

- 32.** In a city, 40% of the people are illiterate and 60% are poor. Among the rich, 10% are illiterate. The percentage of the illiterate poor population is
 (1) 36 (2) 60
 (3) 40 (4) 50
 (SSC CGL Tier-I (CBE) Exam. 31.08.2016) (Ist Sitting)
- 33.** The population of a city is 20000. It increases by 20% during the first year and 30% during the second year. The population after two years will be:
 (1) 32000 (2) 40000
 (3) 31200 (4) 30000
 (SSC CGL Tier-I (CBE) Exam. 02.09.2016) (IInd Sitting)
- 34.** In a village panchayat society 574 names are enlisted as 'below poverty level'. If 14% of the villagers are below poverty level, the total number of villagers is
 (1) 4100 (2) 4200
 (3) 4000 (4) 3800
 (SSC CGL Tier-I (CBE) Exam. 01.09.2016 (IInd Sitting))

TYPE-XI

- 1.** The Government reduced the price of sugar by 10 per cent. By this a consumer can buy 6.2 kg more sugar for ₹ 837. The reduced price per kg of sugar is
 (1) ₹ 12.50 (2) ₹ 13.00
 (3) ₹ 13.50 (4) ₹ 14.00
 (SSC Section Officer (Commercial Audit) Exam. 26.11.2006 (Second Sitting))
- 2.** The price of sugar is reduced by 20%. Now a person can buy 500g more sugar for ₹ 36. The original price of the sugar per kilogram was
 (1) ₹ 14.40 (2) ₹ 18
 (3) ₹ 15.60 (4) ₹ 16.50
 (SSC CGL Prelim Exam. 27.07.2008 (First Sitting))
- 3.** A reduction of 10% in the price of sugar enables a housewife to buy 6.2 kg more for ₹ 1116. The reduced price per kg is
 (1) ₹ 12 (2) ₹ 14
 (3) ₹ 16 (4) ₹ 18
 (SSC CPO S.I. Exam. 06.09.2009)
- 4.** When the price of sugar decreases by 10%, a man could buy 1 kg more for ₹ 270. Then the original price of sugar per kg is
 (1) ₹ 25 (2) ₹ 30
 (3) ₹ 27 (4) ₹ 32
 (SSC CGL Tier-1 Exam 26.06.2011 (First Sitting))



PERCENTAGE

5. A reduction of 20% in the price of an apple enables a man to buy 10 apples more for ₹ 54. The reduced price of apples per dozen is

(1) ₹ 4.32 (2) ₹ 12.96
(3) ₹ 10.80 (4) ₹ 14.40

(SSC CGL Tier-I Exam 26.06.2011
(Second Sitting))

6. Due to an increase of 50% in the price of eggs, 4 eggs less are available for ₹ 24. The present rate of eggs per dozen is :

(1) ₹ 24 (2) ₹ 27
(3) ₹ 36 (4) ₹ 42

(SSC CHSL DEO & LDC
Exam. 27.11.2010)

7. A reduction of 20% in the price of wheat enables Lalita to buy 5 kg more wheat for ₹ 320. The original rate (in rupees per kg) of wheat was

(1) 16 (2) 18
(3) 20 (4) 21

(SSC CHSL DEO & LDC
Exam. 28.11.2010 (IInd Sitting))

8. Due to an increase of 20% in the price of eggs, 2 eggs less are available for ₹ 24. The present rate of eggs per dozen is :

(1) ₹ 25.00 (2) ₹ 26.20
(3) ₹ 27.80 (4) ₹ 28.80

(SSC CHSL DEO & LDC
Exam. 28.11.2010 (1st Sitting))

9. A reduction of 25% in the price of rice enables a person to buy 10 kg more rice for ₹ 600. The reduced per kg price of rice is

(1) ₹ 30 (2) ₹ 25
(3) ₹ 20 (4) ₹ 15

(SSC CHSL DEO & LDC
Exam. 28.11.2010 (IInd Sitting))

10. A reduction in the price of apples enables a person to purchase 3 apples for ₹ 1 instead of ₹ 1.25. What is the % of reduction in price (approximately) ?

(1) 20% (2) 25%

(3) 30% (4) $33\frac{1}{3}\%$

(SSC Graduate Level Tier-I
Exam. 21.04.2013)

11. A number, on subtracting 15 from it, reduces to its 80%. What is 40% of the number?

(1) 75 (2) 60
(3) 30 (4) 90

(SSC Constable (GD) & Rifleman
(GD) Exam. 22.04.2012 (IInd Sitting))

12. A reduction of 21% in the price of an item enables a person to buy 3 kg more for ₹ 100. The reduced price of item per kg is

(1) ₹ 5.50 (2) ₹ 7.50
(3) ₹ 10.50 (4) ₹ 7.00

(SSC CGL Tier-II Exam. 21.09.2014)

13. A reduction of 20% in the price of sugar enables a purchaser to obtain 8 kg more for Rs. 160. Then the price per kg before reduction was

(1) Rs. 5 (2) Rs. 6
(3) Rs. 10 (4) Rs. 4

(SSC CGL Tier-II Exam, 2014 12.04.2015
(Kolkata Region)
TF No. 789 TH 7)

14. The price of an item was increased by 10%. This reduced the monthly total sales by 20%. The overall effect on the value of monthly sales is a

(1) 10% increase
(2) 10% decrease
(3) 12% increase
(4) 12% decrease

(SSC CGL Tier-I

Re-Exam. 30.08.2015)

15. The price of rice has increased by 60%. In order to restore the original price, the new price must be reduced by

(1) $33\frac{1}{3}\%$ (2) $37\frac{1}{2}\%$
(3) 40% (4) 45%

(SSC CGL Tier-I (CBE) Exam. 10.09.2016)

16. If the price of sugar increases by 20%, one can buy 2 kg less for Rs. 50. What is the amount of sugar that could be bought before price hike?

(1) 10 kg. (2) 12 kg.
(3) 14 kg. (4) 16 kg.

(SSC CGL Tier-I (CBE)

Exam. 27.08.2016 (IInd Sitting))

17. The price of an article is decreased by 10%. To restore it to its former value, the new price must be increased by :

(1) $9\frac{1}{11}\%$ (2) 10%

(3) 11% (4) $11\frac{1}{9}\%$

(SSC CGL Tier-I (CBE)

Exam. 29.08.2016 (IInd Sitting))

18. The salary of a person is reduced by 20%. To restore the previous salary, his present salary is to be increased by

(1) 20% (2) 25%
(3) 17.5% (4) 22.5%

(SSC CGL Tier-I (CBE)

Exam. 31.08.2016 (IInd Sitting))

19. Due to a price hike of 20%, 4 kg. less sugar is available for Rs. 120. What is the initial price per kg of sugar ?

(1) Rs. 5 per kg.
(2) Rs. 4 per kg.
(3) Rs. 6 per kg.
(4) Rs. 5.5 per kg.

(SSC CGL Tier-I (CBE)

Exam. 04.09.2016 (IInd Sitting))

20. In 2001, the price of a building was 80% of its original price. In 2002, the price was 60% of its original price. By what percent did the price decrease ?

(1) 15% (2) 20%
(3) 25% (4) 30%

(SSC CGL Tier-I (CBE)

Exam. 27.10.2016 (1st Sitting))

TYPE-XII

1. In a school 70% of the students are girls. The number of boys are 510. Then the total number of students in the school is :

(1) 850 (2) 1700
(3) 1830 (4) 1900

(SSC CGL Prelim Exam. 04.07.1999
(First Sitting))

2. If 60% of the students in a school are boys and the number of girls is 972, how many boys are there in the school ?

(1) 1258 (2) 1458
(3) 1324 (4) 1624

(SSC CGL Prelim Exam. 04.07.1999
(Second Sitting))

3. If 70% of the students in a school are boys and the number of girls be 504, the number of boys is :

(1) 1176 (2) 1008
(3) 1208 (4) 3024

(SSC CGL Prelim Exam. 24.02.2002
(Second Sitting))

4. If the sales tax on a television set

increases from $7\frac{1}{2}\%$ to 8%,

what more amount will have to be paid for the television whose price (excluding sales taxes) is ₹ 19000 ?

(1) ₹ 190 (2) ₹ 95
(3) ₹ 180 (4) ₹ 90

(SSC CGL Prelim Exam. 24.02.2002
(Middle Zone))



PERCENTAGE

5. A spider climbed $62\frac{1}{2}\%$ of the height of the pole in one hour and in the next hour it covered

$12\frac{1}{2}\%$ of the remaining height.

If pole's height is 192 m, then distance climbed in second hour is

- (1) 3 m (2) 5 m
(3) 7 m (4) 9 m

(SSC Section Officer (Commercial Audit) Exam. 16.11.2003)

6. Fresh fruit contains 68% water and dry fruit contains 20% water. How much dry fruit can be obtained from 100 kgs of fresh fruits?

- (1) 32 kgs. (2) 40 kgs.
(3) 52 kgs. (4) 80 kgs.

(SSC CGL Prelim Exam. 08.02.2004 (First Sitting))

7. An individual pays 30% income tax. On this tax he has to pay a surcharge of 10%. Thus, the net tax rate, he has to pay, is

- (1) 45% (2) 40%
(3) 33% (4) 27%

(SSC CPO S.I. Exam. 05.09.2004)

8. X has twice as much money as that of Y and Y has 50% more money than that of Z. If the average money of all of them is ₹ 110, then the money, which X has, is

- (1) ₹ 55 (2) ₹ 60
(3) ₹ 90 (4) ₹ 180

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting))

9. p is six times as large as q . The per cent that q is less than p , is

- (1) $83\frac{1}{3}\%$ (2) 70%

- (3) $63\frac{1}{3}\%$ (4) 50%

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting))

10. In the expression xy^2 , the values of both variables x and y are decreased by 20%. By this, the value of the expression is decreased by

- (1) 40% (2) 80%
(3) 48.8% (4) 51.2%

(SSC CPO S.I. Exam. 16.12.2007)

11. Two numbers are respectively 10% and 25% more than a third number. What per cent is the first of the second?

- (1) 88% (2) 65%
(3) 75% (4) 80%

(SSC CPO S.I. Exam. 06.09.2009)

12. A boy who was asked to find

$3\frac{1}{2}\%$ of a sum of money misread the question and found

$5\frac{1}{2}\%$ of it. His answer was

₹ 220. What would have been the correct answer?

- (1) ₹ 120 (2) ₹ 140
(3) ₹ 160 (4) ₹ 150

(SSC CPO S.I. Exam. 06.09.2009)

13. In a factory 60% of the workers are above 30 years and of these 75% are males and the rest are females. If there are 1350 male workers above 30 years, the total number of workers in the factory is

- (1) 3000 (2) 2000
(3) 1800 (4) 1500

(SSC CGL Tier-1 Exam 19.06.2011 (First Sitting))

14. First and second numbers are less than a third number by 30% and 37% respectively. The second number is less than the first by

- (1) 7% (2) 4%
(3) 3% (4) 10%

(SSC CGL Tier-1 Exam 19.06.2011 (Second Sitting))

15. Rani's weight is 25% that of Meena's and 40% that of Tara's. What percentage of Tara's weight is equal to Meena's weight?

- (1) 160% (2) 140%
(3) 120% (4) 100%

(SSC CPO (SI, ASI & Intelligence Officer) Exam 28.08.2011 (Paper-I))

16. Out of 2500 people, only 60% have the saving habit. If 30% save with bank, 32% with post office and the rest with shares, the number of shareholders are

- (1) 450 (2) 570
(3) 950 (4) 1250

(SSC CPO (SI, ASI & Intelligence Officer) Exam 28.08.2011 (Paper-I))

17. The value of a commodity depreciates 10% annually. If it was purchased 3 years ago and its present value is ₹ 5,832, what was its purchase price?

- (1) ₹ 7200 (2) ₹ 7862
(3) ₹ 8000 (4) ₹ 8500

(SSC CPO S.I. Exam. 09.11.2008)

18. A and B are two fixed points 5 cm apart and C is a point on AB such that AC is 3 cm. If the length of AC is increased by 6%, the length of CB is decreased by

- (1) 6% (2) 7%
(3) 8% (4) 9%

(SSC CGL Prelim Exam. 04.02.2007 (First Sitting))

19. If 24-carat gold is considered to be hundred per cent pure gold, then the percentage of pure gold in 22-carat gold is:

- (1) $91\frac{3}{4}\%$ (2) $91\frac{2}{3}\%$

- (3) $91\frac{1}{3}\%$ (4) $90\frac{2}{3}\%$

(SSC CHSL DEO & LDC Exam. 27.11.2010)

20. In a class, the average score of girls in an examination is 73 and that of boys is 71. The average score for the whole class is 71.8. Find the percentage of girls.

- (1) 40% (2) 50%
(3) 55% (4) 60%

(SSC Multi-Tasking (Non-Technical) Staff Exam. 27.02.2011)

21. Shelf A has $\frac{4}{5}$ of the number of

books that shelf B has. If 25% of the books in A are transferred to B and then 25% of the books from B are transferred to A, then the percentage of the total number of books that A will have is

- (1) 25% (2) 50%
(3) 75% (4) 100%

(SSC CHSL DEO & LDC Exam. 04.12.2011 (1st Sitting (North Zone)))

22. Tickets for all but 100 seats in a 10,000 seat stadium were sold. Of the tickets sold, 20% were sold at half price and the remaining tickets were sold at the full price of ₹ 20. The total revenue from the ticket sales, in ₹ was

- (1) 158400 (2) 178200
(3) 180000 (4) 198000

(SSC CHSL DEO & LDC Exam. 11.12.2011 (1st Sitting (East Zone)))



PERCENTAGE

23. Neha's weight is 140% of Tina's weight. Mina's weight is 90% of Lina's weight. Lina weighs twice as much as Tina. If Neha's weight is $x\%$ of Mina's weight, then x is equal to :

- (1) $64\frac{2}{9}$ (2) $77\frac{7}{9}$
(3) 90 (4) $128\frac{4}{7}$

(SSC CHSL DEO & LDC
Exam. 11.12.2011
IInd Sitting (East Zone))

24. The number of seats in a cinema hall is increased by 25%. The cost of each ticket is also increased by 10%. The effect of these changes on the revenue collection will be an increase of
- (1) 37.5% (2) 45.5%
(3) 47.5% (4) 49.5%

(SSC Data Entry Operator
Exam. 31.08.2008)

25. A man had a certain amount with him. He spent 20% of that to buy an article and 5% of the remaining on transport. Then he gifted ₹ 120. If he is left with ₹ 1,400, the amount he spent on transport is

- (1) ₹ 76 (2) ₹ 61
(3) ₹ 95 (4) ₹ 80

(SSC Graduate Level Tier-II
Exam. 16.09.2012)

26. 31% of employees pay tax in the year 2008. Non-tax paying employees are 20,700. The total number of employees are :

- (1) 31,160 (2) 64,750
(3) 30,000 (4) 66,775

(SSC CHSL DEO & LDC
Exam. 21.10.2012 (IInd Sitting))

27. A fruit seller had some apples. He sells 40% apples and still has 420 apples. Originally, he had :
- (1) 588 apples (2) 600 apples
(3) 672 apples (4) 700 apples

(SSC CGL Prelim Exam. 24.02.2002
(First Sitting))

28. Two numbers are more than the third number by 20% and 50% respectively. First number is what per cent of the second number ?

- (1) 100% (2) 150%
(3) 80% (4) 120%

(SSC CGL Prelim Exam. 24.02.2002
(Middle Zone) & (SSC Data Entry
Operator Exam. 02.08.2009))

29. A batsman scored 110 runs which included 3 boundaries and 8 sixes. What per cent of his total score, did he make by running between the wickets ?

- (1) 45% (2) $45\frac{5}{11}\%$
(3) $54\frac{6}{11}\%$ (4) 55%

(SSC CGL Prelim Exam. 08.02.2004
(First Sitting))

30. The price of an article was increased by $r\%$. Later the new price was decreased by $r\%$. If the latest price was ₹ 1, then the original price was :

- (1) ₹ 1 (2) ₹ $\frac{1-r^2}{100}$
(3) ₹ $\frac{\sqrt{1-r^2}}{100}$ (4) ₹ $\left(\frac{10000}{10000-r^2}\right)$

(SSC CGL Prelim Exam. 08.02.2004
(First Sitting))

31. If a number x is 10% less than another number y and y is 10% more than 125, then x is equal to
- (1) 150 (2) 143
(3) 140.55 (4) 123.75

(SSC CGL Prelim Exam. 13.11.2005
(First Sitting))

32. An interval of 3 hours 40 minutes is wrongly estimated as 3 hours 45.5 minutes. The error percentage is

- (1) 5.5% (2) 5.2%
(3) 5% (4) 2.5%

(SSC Section Officer (Commercial Audit)
Exam. 26.11.2006 (Second Sitting))

33. In a village, each of the 60% of families has a cow; each of the 30% of families has a buffalo and each of the 15% of families has both a cow and buffalo. In all there are 96 families in the village. How many families do not have a cow or a buffalo ?

- (1) 20 (2) 24
(3) 26 (4) 28

(SSC CGL Prelim Exam. 04.02.2007
(Second Sitting))

34. A man invests a part of ₹ 10,000 at 5% and the remainder at 6%. The 5% investment yields annually ₹ 76.50 more than the 6% investment. The amount invested at 6% is

- (1) ₹ 3,600 (2) ₹ 3,550
(3) ₹ 3,850 (4) ₹ 4,000

(SSC CPO S.I. Exam. 09.11.2008)

35. For every set of 19 kites sold, a vendor gives 1 kite extra, free of cost. In order to give a discount of 10%, the number of extra kites he should give in a sale of 27 kites to the nearest integer is

- (1) 3 (2) 6
(3) 7 (4) 8

(SSC Graduate Level Tier-I
Exam. 21.04.2013 IInd Sitting)

36. A number is divided into two parts in such a way that 80% of 1st part is 3 more than 60% of 2nd part and 80% of 2nd part is 6 more than 90% of the 1st part. Then the number is

- (1) 125 (2) 130
(3) 135 (4) 145

(SSC CHSL DEO & LDC

Exam. 28.10.2012 (1st Sitting))

37. A man invested ₹ 27,000 in $12\frac{1}{2}\%$ stock at 108, then his yield percentage is

- (1) $18\frac{3}{4}\%$ (2) $11\frac{31}{54}\%$

- (3) 15% (4) $8\frac{1}{2}\%$

(SSC CGL Tier-I Re-Exam. (2013)
20.07.2014 (1st Sitting))

38. The percentage of metals in a mine of lead ore is 60%. Now the

percentage of silver is $\frac{3}{4}\%$ of

metals and the rest is lead. If the mass of ore extracted from this mine is 8000 kg, the mass (in kg.) of lead is :

- (1) 4763 (2) 4762
(3) 4764 (4) 4761

(SSC CGL Tier-I Exam, 16.08.2015
(IInd Sitting) TF No. 2176783)

39. The sum of two positive numbers is 20% of the sum of their squares and 25% of the difference of their squares. If the num-

bers are x and y then, $\frac{x+y}{x^2}$ is

equal to

- (1) $\frac{1}{4}$ (2) $\frac{3}{8}$

- (3) $\frac{1}{3}$ (4) $\frac{2}{9}$

(SSC Constable (GD)

Exam, 04.10.2015, IInd Sitting)

40. A man bought some eggs of which 10% are rotten. He gives 80% of the remainder to his neighbours. Now he is left out with 36 eggs. How many eggs he bought ?

- (1) 40 (2) 100
(3) 200 (4) 72

(SSC CHSL (10+2) LDC, DEO
& PA/SA Exam, 15.11.2015
(1st Sitting) TF No. 6636838)



PERCENTAGE

41. A man gives 50% of his money to his son and 30% to his daughter. 80% of the rest is donated to a trust. If he is left with Rs. 16,000 now, how much money did he have in the beginning?

(1) Rs. 40,000 (2) Rs. 8,00,000
(3) Rs. 80,000 (4) Rs. 4,00,000

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 20.12.2015
(1st Sitting) TF No. 9692918)

42. A businessman's earning increases by 25% in one year but decreases by 4% in the next year. Going by this pattern, after 5 years, his total earnings would be Rs. 72,000. What is his present earning?

(1) Rs. 10000 (2) Rs. 80000
(3) Rs. 40000 (4) Rs. 54000

(SSC CGL Tier-II Online Exam, 01.12.2016)

43. The red blood cells in a blood sample grows by 10% per hour in first two hours, decreases by 10% in next one hour, remains constant in next one hour and again increases by 5% per hour in next two hours. If the original count of the red blood cells in the sample is 40000, find the **approximate** red blood cell count at the end of 6 hours.

(1) 40000 (2) 45025
(3) 48025 (4) 50025

(SSC CAPFs (CPO) SI & ASI, Delhi Police Exam, 05.06.2016
(1st Sitting))

44. A factory's yearly budget for the purchase of employees' protection shoes increased by 60% this year over last year. If the price of the shoes increased by 20% this year, then the number of shoes it can purchase this year is what percent greater than the number of shoes it purchased last year?

(1) 40% (2) $33\frac{1}{3}\%$

(3) 42% (4) 48%

(SSC CPO SI & ASI, Online Exam, 06.06.2016) (IInd Sitting)

45. A Set A consists of integers 27, 28, 30, 32, and 33. If integer k is included in the average of set A will increase by 30%. What is the value of integer K?

(1) 68 (2) 79
(3) 84 (4) 92

(SSC CPO SI & ASI, Online Exam, 06.06.2016) (IInd Sitting)

46. A person loses 75% of his money in the first bet, 75% of the remaining in the second and 75% of the remaining in the third bet and returns home with Rs. 2 only. His initial money was

(1) Rs. 64 (2) Rs. 128
(3) Rs. 256 (4) Rs. 512

(SSC CGL Tier-I (CBE) Exam, 28.08.2016) (IInd Sitting)

47. An army lost 10% of its men in war, 10% of the remaining died due to disease and 10% of the rest were declared disabled. Thus the strength of the army was reduced to 7,29,000 active men. The original strength of the army was

(1) 1500000 (2) 1000000
(3) 1200000 (4) 1100000

(SSC CGL Tier-II (CBE) Exam, 30.11.2016)

48. If the value of a company stock drops from Rs. 25 per share to Rs. 21 per share, the percentage decrease per share is:

(1) 4 (2) 8
(3) 12 (4) 16

(SSC CGL Tier-I (CBE)

Exam, 03.09.2016 (IInd Sitting))

49. Starting with 8000 workers, the company increases the number of workers by 5%, 10% and 20% at the end of first, second and third year respectively. The number of workers in the fourth year was

(1) 10188 (2) 11088
(3) 11008 (4) 11808

(SSC CGL Tier-I (CBE)

Exam, 04.09.2016 (IInd Sitting))

50. If "basis points" are defined so that 1 per cent is equal to 100 basis points, then by how many basis points is 82.5 per cent greater than 62.5 per cent?

(1) 0.2 (2) 20
(3) 200 (4) 2000

(SSC CGL Tier-I (CBE)

Exam, 10.09.2016 (IInd Sitting))

51. In the last financial year, a car company sold 41,800 cars. In this year, the target is to sell 51,300 cars. By what per cent must the sale be increased?

(1) $11\frac{9}{22}\%$ (2) $8\frac{9}{22}\%$

(3) $8\frac{11}{23}\%$ (4) $22\frac{8}{11}\%$

(SSC CGL Tier-I (CBE)

Exam, 10.09.2016 (IInd Sitting))

52. In a motor of 120 machine parts, 5% parts were defective. In another motor of 80 machine parts, 10% parts were defective. For the two motors considered together, the percentage of defective machine parts was

(1) 7 (2) 6.5
(3) 7.5 (4) 8

(SSC CGL Tier-I (CBE)

Exam, 11.09.2016 (IInd Sitting))

53. A line of length 1.5 metres was measured as 1.55 metres by mistake. What will be the value of error per cent?

(1) 0.05% (2) $3\frac{7}{31}\%$

(3) $3\frac{1}{3}\%$ (4) 0.5%

(SSC CGL Tier-II (CBE)

Exam, 12.01.2017)

54. A businessman imported Laptops, worth Rs. 210,000, Mobile phones worth Rs. 1,00,000 and Television sets worth Rs. 1,50,000. He had to pay 10% duty on laptops, 8% on Phones and 5% on Television sets as a special case. How much total duty (in Rupees) he had to pay on all items as per above details?

(1) 36500 (2) 37000
(3) 37250 (4) 37500

(SSC CGL Tier-II (CBE)

Exam, 12.01.2017)

55. A man spends $7\frac{1}{2}\%$ of his money

and after spending 75% of the remaining he had Rs. 370 left. How much money did he have?

(1) Rs. 1200 (2) Rs. 1600
(3) Rs. 1500 (4) Rs. 1400

(SSC CGL Tier-II (CBE)

Exam, 12.01.2017)

56. On a certain date, Pakistan has a success rate of 60% against India in all the ODIs played between the two countries. They lost the next 30 ODIs in a row to India and their success rate comes down to 30%. The total number of ODIs played between the two countries is

(1) 50 (2) 45
(3) 60 (4) 30

(SSC CGL Tier-II (CBE)

Exam, 12.01.2017)

SHORT ANSWERS

TYPE-I

1. (3)	2. (4)	3. (1)	4. (4)
5. (3)	6. (3)	7. (4)	8. (1)
9. (2)	10. (4)	11. (4)	12. (2)
13. (1)	14. (3)	15. (2)	16. (4)
17. (2)	18. (1)	19. (1)	20. (3)
21. (2)	22. (3)	23. (4)	24. (2)
25. (4)	26. (4)	27. (1)	28. (4)
29. (4)	30. (4)	31. (1)	32. (1)



PERCENTAGE

33. (2)	34. (1)	35. (4)	36. (3)
37. (3)	38. (1)	39. (3)	40. (4)
41. (2)	42. (2)	43. (4)	44. (3)
45. (3)	46. (3)	47. (2)	48. (1)
49. (2)	50. (3)	51. (3)	52. (4)
53. (2)	54. (3)	55. (4)	56. (4)
57. (4)	58. (1)	59. (2)	60. (3)
61. (1)	62. (1)	63. (1)	64. (1)
65. (2)	66. (1)	67. (2)	68. (1)
69. (2)	70. (3)	71. (1)	72. (2)
73. (4)	74. (3)	75. (4)	76. (1)
77. (3)	78. (2)	79. (4)	80. (1)
81. (3)	82. (2)	83. (2)	84. (2)
85. (3)	86. (3)	87. (2)	88. (3)
89. (3)	90. (1)	91. (2)	92. (3)
93. (3)	94. (4)		

TYPE-II

1. (1)	2. (1)	3. (4)	4. (2)
5. (3)	6. (1)	7. (4)	8. (4)
9. (2)	10. (1)	11. (2)	12. (3)
13. (1)	14. (2)	15. (3)	16. (2)
17. (3)			

TYPE-III

1. (2)	2. (2)	3. (3)	4. (2)
5. (1)	6. (1)	7. (3)	8. (4)
9. (2)	10. (3)	11. (2)	12. (4)
13. (1)	14. (3)	15. (2)	16. (3)
17. (3)	18. (2)	19. (1)	20. (2)
21. (2)	22. (2)	23. (3)	24. (2)
25. (3)	26. (2)	27. (1)	28. (3)
29. (3)	30. (2)	31. (1)	32. (2)
33. (4)	34. (4)	35. (4)	36. (3)
37. (1)	38. (2)	39. (4)	40. (2)
41. (1)	42. (3)	43. (1)	44. (2)
45. (2)	46. (3)	47. (2)	48. (1)
49. (2)	50. (*)	51. (3)	52. (1)
53. (1)	54. (2)	55. (1)	56. (4)
57. (3)	58. (2)	59. (2)	

TYPE-IV

1. (1)	2. (1)	3. (1)	4. (3)
5. (4)	6. (1)	7. (3)	8. (3)
9. (4)	10. (2)	11. (4)	12. (4)
13. (4)	14. (2)	15. (1)	16. (3)
17. (2)	18. (4)	19. (4)	20. (1)

21. (2)	22. (1)	23. (4)	24. (2)
25. (3)	26. (1)	27. (1)	28. (1)
29. (3)	30. (4)	31. (2)	32. (4)
33. (1)	34. (1)	35. (2)	36. (2)
37. (2)	38. (2)		

TYPE-V

1. (2)	2. (4)	3. (1)	4. (2)
5. (2)	6. (3)	7. (2)	8. (4)
9. (1)	10. (4)	11. (4)	12. (2)
13. (2)	14. (3)	15. (2)	16. (1)
17. (2)	18. (2)	19. (3)	20. (2)
21. (3)	22. (2)	23. (2)	

TYPE-VI

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

TYPE-VII

1. (3)	2. (3)	3. (3)	4. (3)
5. (1)	6. (1)	7. (3)	8. (1)
9. (3)	10. (1)	11. (2)	12. (2)
13. (2)	14. (4)	15. (2)	16. (2)
17. (1)	18. (3)	19. (4)	20. (4)
21. (3)	22. (2)	23. (3)	24. (2)
25. (2)	26. (1)	27. (4)	28. (1)
29. (4)	30. (3)	31. (1)	32. (1)
33. (1)	34. (3)	35. (1)	36. (2)
37. (2)	38. (4)	39. (2)	40. (4)
41. (4)	42. (4)	43. (4)	44. (3)
45. (3)	46. (2)	47. (1)	48. (2)
49. (1)	50. (4)	51. (3)	52. (3)
53. (3)	54. (1)		

TYPE-VIII

1. (1)	2. (3)	3. (3)	4. (2)
5. (1)	6. (2)	7. (3)	8. (4)
9. (2)	10. (4)	11. (3)	12. (1)
13. (3)	14. (4)	15. (2)	16. (2)
17. (3)	18. (2)	19. (3)	20. (3)
21. (3)	22. (4)	23. (1)	24. (1)
25. (4)	26. (2)	27. (3)	28. (3)
29. (3)	30. (1)	31. (4)	32. (3)
33. (2)	34. (4)	35. (1)	

TYPE-IX

1. (4)	2. (3)	3. (3)	4. (4)
5. (3)	6. (4)	7. (2)	8. (2)
9. (3)	10. (4)	11. (4)	12. (2)
13. (2)	14. (2)		

TYPE-X

1. (3)	2. (1)	3. (3)	4. (1)
5. (1)	6. (3)	7. (2)	8. (1)
9. (1)	10. (4)	11. (2)	12. (2)
13. (2)	14. (3)	15. (4)	16. (1)
17. (1)	18. (1)	19. (3)	20. (1)
21. (4)	22. (1)	23. (2)	24. (1)
25. (3)	26. (2)	27. (4)	28. (3)
29. (1)	30. (2)	31. (1)	32. (2)
33. (3)	34. (1)		

TYPE-XI

1. (3)	2. (2)	3. (4)	4. (2)
5. (2)	6. (3)	7. (1)	8. (4)
9. (4)	10. (1)	11. (3)	12. (4)
13. (1)	14. (4)	15. (2)	16. (2)
17. (4)	18. (2)	19. (1)	20. (3)

TYPE-XII

1. (2)	2. (2)	3. (1)	4. (2)
5. (4)	6. (3)	7. (3)	8. (4)
9. (1)	10. (3)	11. (1)	12. (2)
13. (1)	14. (4)	15. (1)	16. (2)
17. (3)	18. (4)	19. (2)	20. (1)
21. (2)	22. (2)	23. (2)	24. (1)
25. (4)	26. (3)	27. (4)	28. (3)
29. (2)	30. (4)	31. (4)	32. (4)
33. (2)	34. (3)	35. (1)	36. (3)
37. (2)	38. (3)	39. (4)	40. (3)
41. (4)	42. (3)	43. (3)	44. (2)
45. (3)	46. (2)	47. (2)	48. (4)
49. (2)	50. (4)	51. (4)	52. (1)
53. (3)	54. (1)	55. (2)	56. (3)



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EXPLANATIONS

TYPE-I

1. (3) According to question,

$$A \times \frac{80}{100} = B \times \frac{50}{100}$$

$$\therefore B = \frac{A \times 80}{50} = 1.6A$$

$$\therefore B = 160\% \text{ of } A$$

$$\therefore x = 160$$

2. (4) According to question,

$$y = \frac{100 \times 100}{80} \text{ of } x$$

$$\therefore y = 125\% \text{ of } x$$

3. (1) $\frac{8x}{100} = \frac{4y}{100}$

$$\Rightarrow y = 2x$$

$$\therefore 20\% \text{ of } x = 10\% \text{ of } y.$$

4. (4) Let x be the multiplicand.

$$\therefore \text{Error} = \frac{5}{3}x - \frac{3}{5}x$$

$$= \frac{25x - 9x}{15} = \frac{16x}{15}$$

$$\therefore \text{Percentage error}$$

$$= \frac{\frac{16x}{15}}{\frac{16x}{15}} \times 100 = \frac{15}{5} \times 100$$

$$= \frac{16x}{15} \times \frac{3}{5x} \times 100 = 64\%$$

5. (3) $p\%$ of $p = 36$

$$\Rightarrow \frac{p}{100} \times p = 36$$

$$\Rightarrow p^2 = 3600$$

$$\Rightarrow p = 60$$

6. (3) Let 2 be $x\%$ of 50

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

$$\Rightarrow \frac{x}{100} \times 50 = 2 \Rightarrow \frac{x}{2} = 2$$

$$\therefore x = 4$$

7. (4) Let $x\%$ of $\frac{1}{3} = \frac{2}{3}$

$$\Rightarrow x\% = \frac{2 \times 3}{3} = 2 \Rightarrow x = 200\%$$

8. (1) 0.15% of $33\frac{1}{3}\%$ of ₹ 10000

$$= \frac{0.15}{100} \times \frac{100}{300} \times 10000 = ₹5$$

9. (2) 30% of $x = 72$

$$\therefore x = \frac{72 \times 100}{30} = 240$$

10. (4) 15% of $(A + B)$
 $= 25\%$ of $(A - B)$

$$\Rightarrow \frac{15}{100}(A + B) = \frac{25}{100}(A - B)$$

$$\Rightarrow 15(A + B) = 25(A - B)$$

$$\Rightarrow 15A + 15B = 25A - 25B$$

$$\Rightarrow 10A = 40B$$

$$\Rightarrow A = 4B$$

Now, let $x\%$ of B is equal to A

$$\therefore \frac{x}{100} \times B = A \Rightarrow \frac{x}{100} \times B = 4B$$

$$\therefore x = 400\%$$

11. (4) 20% of 25% of 300

$$= \frac{20}{100} \times \frac{25}{100} \times 300$$

$$= \frac{1}{5} \times \frac{1}{4} \times 300 = 15$$

12. (2) $x\%$ of $\frac{25}{2} = 150$

$$\Rightarrow \frac{x}{100} \times \frac{25}{2} = 150$$

$$\Rightarrow \frac{x}{8} = 150$$

$$\Rightarrow x = 150 \times 8 = 1200$$

13. (1) 50% of $(x - y)$
 $= 30\%$ of $(x + y)$

$$\Rightarrow \frac{1}{2}(x - y) = \frac{3}{10}(x + y)$$

$$\Rightarrow \frac{x}{2} - \frac{3x}{10} = \frac{3}{10}y + \frac{y}{2}$$

$$\Rightarrow \frac{5x - 3x}{10} = \frac{3y + 5y}{10}$$

$$\Rightarrow \frac{x}{5} = \frac{4y}{5}$$

$$\therefore x = 4y$$

$$\Rightarrow y = \frac{x}{4} \text{ or } \frac{x}{4} \times 100\% = 25x\%$$

Obviously, y is 25% of x

14. (3) $P \times \frac{50}{100} = Q \times \frac{25}{100}$

$$\Rightarrow P \times 50 = Q \times 25$$

$$\Rightarrow P = \frac{Q \times 25}{50} \Rightarrow P = \frac{Q}{2}$$

$$P = Q \times x\%$$

$$\therefore Q \times \frac{x}{100} = \frac{Q}{2}$$

$$\Rightarrow x = \frac{100}{2} = 50$$

15. (2) 20% of $A = 50\%$ of B

$$\Rightarrow 2A = 5B \Rightarrow A = \frac{5B}{2}$$

Let B is $x\%$ of A .

$$\therefore \frac{5B}{2} \times \frac{x}{100} = B$$

$$\Rightarrow x = \frac{200}{5} = 40\%$$

16. (4) Since 18% of the students neither play football nor cricket. It means 82% of the students either play football or cricket or both.

Using set theory

$$\therefore n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$$\Rightarrow 82 = 40 + 50 - n(A \cap B)$$

$$\Rightarrow n(A \cap B) = 90 - 82 = 8$$

$$\therefore 8\% \text{ students play both games.}$$

17. (2) $\frac{20(P + Q)}{100} = \frac{50}{100}(P - Q)$

$$\Rightarrow \frac{P + Q}{P - Q} = \frac{5}{2}$$

$$\Rightarrow \frac{2P}{2Q} = \frac{5 + 2}{5 - 2}$$

[By componendo & dividendo]

$$\Rightarrow \frac{P}{Q} = \frac{7}{3} \text{ or } 7 : 3$$

18. (1) Let $x\% \times 0.1 = 0.01$

$$\Rightarrow \frac{x}{100} \times 0.1 = 0.01$$

$$\Rightarrow x = \frac{0.01 \times 100}{0.1} = 10$$

19. (1) Required percentage

$$= \frac{65}{2000} \times 100 = \frac{13}{4}$$

$$[\because 2\text{kg} = 2000\text{g}]$$

20. (3) $1\% = \frac{1}{100}$

$$\therefore \frac{1}{100} \times \frac{1}{2} = \frac{1}{200} = 0.005$$

21. (2) 1 hour 45 minutes

$$= 1\frac{3}{4} \text{ hours} = \frac{7}{4} \text{ hours}$$

$$1 \text{ day} = 24 \text{ hours}$$

$$\therefore \text{Required per cent}$$

$$\frac{7}{24} \times 100$$

$$= \frac{7}{4 \times 24} \times 100$$

$$= 7.292\%$$



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22. (3) Required percentage

$$= \frac{1.14}{1.9} \times 100 = 60\%$$

23. (4) Required percentage

$$= \frac{32}{80} \times 100 = 40\%$$

$$24. (2) A \times \frac{90}{100} = \frac{B \times 30}{100}$$

$$\Rightarrow A \times 3 = B$$

$$\Rightarrow A \times x\% = A \times 3$$

$$\Rightarrow \frac{x}{100} = 3 \Rightarrow x = 300$$

$$25. (4) \frac{A \times 90}{100} = \frac{B \times 30}{100}$$

$$\Rightarrow 3A = B$$

$$\Rightarrow 3A = A \times \frac{2x}{100}$$

$$\Rightarrow 300 = 2x \Rightarrow x = 150$$

$$26. (4) A \times \frac{30}{100} + \frac{B \times 40}{100} = \frac{B \times 80}{100}$$

$$\Rightarrow A \times 30 = B \times 40$$

$$\Rightarrow \frac{A}{B} = \frac{40}{30} = \frac{4}{3}$$

$$\Rightarrow \frac{B}{A} = \frac{3}{4}$$

$$\Rightarrow \frac{B}{A} \times 100 = \frac{3}{4} \times 100 = 75\%$$

$$27. (1) (A + B) \times \frac{40}{100}$$

$$= (A - B) \times \frac{60}{100}$$

$$\Rightarrow 2(A + B) = 3(A - B)$$

$$\Rightarrow 2A + 2B = 3A - 3B$$

$$\Rightarrow A = 5B$$

$$\therefore \frac{2A - 3B}{A + B} = \frac{10B - 3B}{5B + B}$$

$$= \frac{7B}{6B} = \frac{7}{6}$$

$$28. (4) 0.1\% = \frac{0.1}{100} = 0.001$$

29. (4) Required percentage

$$= \frac{70}{3.5 \times 1000} \times 100 = 2\%$$

$$30. (4) \frac{1}{3} \text{ of } 1206 = 1206 \times \frac{1}{3} = 402$$

\therefore Required percent

$$= \frac{402}{134} \times 100 = 300\%$$

$$31. (1) a \times \frac{120}{100} = b \times \frac{80}{100}$$

$$\Rightarrow \frac{b}{a} = \frac{120}{80} = \frac{3}{2}$$

$$\therefore \frac{b+a}{b-a} = \frac{\frac{b}{a}+1}{\frac{b}{a}-1} = \frac{\frac{3}{2}+1}{\frac{3}{2}-1} = \frac{\frac{5}{2}}{\frac{1}{2}} = 5$$

$$32. (1) (A + B) \times \frac{20}{100} = B \times \frac{50}{100}$$

$$\Rightarrow \frac{A+B}{5} = \frac{B}{2}$$

$$\Rightarrow 2A + 2B = 5B$$

$$\Rightarrow 2A = 3B$$

$$\Rightarrow \frac{2A}{B} = 3 \text{ or } 2A = 3B$$

$$\therefore \frac{2A-B}{2A+B} = \frac{\frac{2A}{B}-1}{\frac{2A}{B}+1} = \frac{3-1}{3+1}$$

$$= \frac{2}{4} = \frac{1}{2} = \frac{3B-B}{3B+B} = \frac{2B}{4B}$$

$$33. (2) \frac{ax}{100} = \frac{by}{100}$$

$$\Rightarrow b = \frac{ax}{y}$$

$$\therefore z\% \text{ of } b = \frac{ax}{y} \times \frac{z}{100}$$

$$= \frac{xz}{y}\% \text{ of } a$$

$$34. (1) 60 \times 60 \times \frac{y}{100}$$

$$= 1 \text{ minute } 12 \text{ seconds}$$

$$\Rightarrow 36y = 72 \Rightarrow y = 2$$

35. (4) Required percentage

$$= \frac{72}{3.6 \times 1000} \times 100 = 2\%$$

36. (3) Let the total number of employees be x .

$$\therefore x \times \frac{69}{100} = 20700$$

$$\Rightarrow x = \frac{20700 \times 100}{69} = 30000$$

37. (3) Required percentage

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

$$38. (1) x \times \frac{125}{100} = 100$$

$$\Rightarrow x = \frac{100 \times 100}{125} = 80$$

$$39. (3) x \times \frac{83}{100} = 498$$

$$\Rightarrow x = \frac{498 \times 100}{83} = 600$$

40. (4) Let $C = 100$

Then, $A = 150$

$B = 125$

\therefore Required percentage

$$= \frac{150 - 125}{125} \times 100 = 20\%$$

41. (2) If the number of trees in the garden be x , then

$$x \times \frac{60}{100} \times \frac{25}{100} \times \frac{20}{100} = 1500$$

$$\Rightarrow x \times \frac{3}{5} \times \frac{1}{4} \times \frac{1}{5} = 1500$$

$$\Rightarrow x = \frac{1500 \times 5 \times 4 \times 5}{3}$$

$$= 50000$$

$$42. (2) \text{ Males} = 25000 \times \frac{4}{5} = 20000$$

Females = 5000

Educated males

$$= 20000 \times \frac{95}{100} = 19000$$

Educated females

$$= \frac{5000 \times 60}{100} = 3000$$

Total educated persons

$$= 22000$$

\therefore Required per cent

$$= \frac{22000}{25000} \times 100 = 88\%$$

43. (4) Required number

$$= \frac{240 \times 25}{100} - \frac{160 \times 15}{100}$$

$$= 60 - 24 = 36$$



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44. (3) First part = ₹ x and second part = ₹ y .

$$\therefore \frac{x \times 80}{100} = \frac{y \times 60}{100} + 3$$

$$\Rightarrow \frac{4x}{5} = \frac{3y}{5} + 3$$

$$\Rightarrow 4x - 3y = 15 \quad \dots(i)$$

Again,

$$\frac{4y}{5} = \frac{9x}{10} + 6$$

$$\Rightarrow 8y = 9x + 60$$

$$\Rightarrow 8y - 9x = 60 \quad \dots(ii)$$

By equation (i) $\times 8$ + (ii) $\times 3$,

$$32x - 24y = 120$$

$$24y - 27x = 180$$

$$5x = 300 \Rightarrow x = 60$$

From equation (i)

$$4 \times 60 - 3y = 15$$

$$\Rightarrow 3y = 240 - 15 = 225$$

$$\Rightarrow y = \frac{225}{3} = 75$$

$$\therefore x + y = 60 + 75 = 135$$

45. (3) Group A = 40%

$$\text{Group B} = \frac{60 \times 75}{100} = 45\%$$

Group C = 15%

If the total number of students be x , then

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

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

46. (3) After taking away respective balls,

Number of balls in the box

$$= 75 + 25 + 50 = 150$$

\therefore Percentage of black balls

$$= \frac{50}{150} \times 100$$

$$= \frac{100}{3} = 33\frac{1}{3}\%$$

47. (2) \therefore S.P. of a dozen pairs of socks

$$= \frac{180 \times 80}{100} = ₹ 144$$

\therefore S.P. of 1 pair of socks

$$= \frac{144}{12} = ₹ 12$$

\therefore No of pairs available for

$$₹ 48 = \frac{48}{12} = 4$$

48. (1) Let the number be x .

$$\therefore \frac{3}{5} \times \frac{60}{100} \times x = 36$$

$$\Rightarrow x = \frac{36 \times 5 \times 5}{3 \times 3} = 100$$

49. (2) $\frac{P - Q}{2} = (P + Q) \times \frac{30}{100}$

$$\Rightarrow 5(P - Q) = (P + Q) \times 3$$

$$\Rightarrow 5P - 3P = 5Q + 3Q$$

$$\Rightarrow 2P = 8Q$$

$$\Rightarrow P = 4Q = 4 \times \frac{P \times x}{100}$$

$$\Rightarrow \frac{4x}{100} = 1 \Rightarrow x = 25$$

50. (3) Let greater number be x .

\therefore Smaller number = $150 - x$

According to the question,

$$\frac{40 \times x}{100} = \frac{60(150 - x)}{100}$$

$$\Rightarrow 2x = 3 \times 150 - 3x$$

$$\Rightarrow 5x = 3 \times 150$$

$$\Rightarrow x = 90$$

51. (3) Let the number be x . According to the question

$$80\% \text{ of } x + 80 = x$$

$$\Rightarrow \frac{80x}{100} + 80 = x$$

$$\Rightarrow \frac{4x}{5} + 80 = x$$

$$\Rightarrow \frac{x}{5} = 80 \Rightarrow x = 400$$

52. (4) Suppose number be x

$$20\% \text{ of } x = 120$$

$$x \times \frac{20}{100} = 120$$

$$x = \frac{120 \times 100}{20} = 600$$

$$600 \times 120\% = 600 \times \frac{120}{100} = 720$$

53. (2) Let the number be x . Then

$$x - 60\% \text{ of } x = 60$$

$$\Rightarrow x - 0.60x = 60$$

$$\Rightarrow 0.4x = 60$$

$$\Rightarrow x = \frac{60}{0.4} \Rightarrow x = \frac{600}{4}$$

$$x = 150$$

\therefore The number is 150

54. (3) Let number be x .

\therefore According to question,

$$75\% \text{ of } x + 75 = x$$

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

$$x = 75 \times 4 = 300$$

55. (4) Let the third number be x ,

According to the question;

$$\text{First number} = \frac{20}{100} \times x = \frac{x}{5}$$

$$\text{Second number} = \frac{50}{100} \times x = \frac{x}{2}$$

\therefore Required percentage

$$= \frac{\frac{x}{5} \times 100}{\frac{x}{2}} = \frac{x}{5} \times \frac{2}{x} \times 100 = 40\%$$

56. (4) **Rule :** If two numbers are respectively $x\%$ and $y\%$ less than the third number, first number as a percentage of

$$\text{second is } \frac{100 - x}{100 - y} \times 100\%$$

\therefore Required percentage

$$= \frac{100 - 25}{100 - 20} \times 100\%$$

$$= \frac{75}{80} \times 100\% = 93.75\%$$

57. (4) According to question

$$x + \frac{x \times 150}{100} = 150$$

$$\Rightarrow x + \frac{3}{2}x = 150$$

$$\Rightarrow 2x + 3x = 2 \times 150 = 300$$

$$\Rightarrow 5x = 300 \Rightarrow x = 60$$

58. (1) Let the number be x .

According to the question,

$$x \times \frac{18}{100} = 75 \times \frac{12}{100}$$

$$\Rightarrow x = \frac{75 \times 12}{18} = 50$$

59. (2) Let the numbers be x and y and $x > y$.

According to the question,

$$6\frac{1}{2}\% \text{ of } x = 8\frac{1}{2}\% \text{ of } y$$

$$\text{or } \frac{13}{2}\% \text{ of } x = \frac{17}{2}\% \text{ of } y$$

$$\text{or } 13x = 17y$$

$$\text{or } x = \frac{17}{13}y$$

$$\therefore \frac{17}{13}y - y = 1660$$



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$$\text{or } \frac{17y - 13y}{13} = 1660$$

$$\text{or } 4y = 1660 \times 13$$

$$\text{or } y = \frac{1660 \times 13}{4} = 5395$$

60. (3) If the number be x , then

$$x \times \frac{75}{100} + 75 = x$$

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

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

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

$$\Rightarrow x = 4 \times 75 = 300$$

$$\therefore 40\% \text{ of } 300$$

$$= \frac{300 \times 40}{100} = 120$$

61. (1) Number to be added = x (let)

$$\therefore \frac{320 \times 10}{100} + x = \frac{230 \times 30}{100}$$

$$\Rightarrow 32 + x = 69$$

$$\Rightarrow x = 69 - 32 = 37$$

62. (1) X is 20% less than Y .

$$\text{If } Y = 100, X = 80$$

$$\therefore \frac{Y - X}{Y} = \frac{100 - 80}{100}$$

$$= \frac{20}{100} = \frac{1}{5}$$

$$\frac{X}{X - Y} = \frac{80}{80 - 100}$$

$$= \frac{80}{-20} = -4$$

63. (1) 1% of 1% of 25% of 1000

$$= 1000 \times \frac{25}{100} \times \frac{1}{100} \times \frac{1}{100}$$

$$= 0.025$$

$$64. (1) \frac{120 \times 25}{100} + \frac{380 \times 40}{100}$$

$$= 637 \times ?$$

$$\Rightarrow 30 + 152 = 637 \times ?$$

$$\Rightarrow 182 = 637 \times ?$$

$$\Rightarrow ? = \frac{182}{637} = \frac{2}{7}$$

65. (2) Population of the illiterate in the village

$$= (100 - 30)\% \text{ of } 6600$$

$$= \frac{6600 \times 70}{100} = 4620$$

66. (1) 8% of $x = 4\%$ of y

$$\Rightarrow x \times \frac{8}{100} = \frac{y \times 4}{100}$$

$$\Rightarrow x = \frac{4}{8} y = \frac{y}{2}$$

$$\therefore 20\% \text{ of } x = \frac{20}{100} \text{ of } \frac{y}{2}$$

$$= \frac{10}{100} \text{ of } y$$

$$= 10\% \text{ of } y$$

67. (2) Let the number be x .

$$\therefore x \times \frac{3}{4} \times \frac{4}{5} \times \frac{40}{100} = 48$$

$$\Rightarrow x \times \frac{3}{5} \times \frac{2}{5} = 48$$

$$\Rightarrow x = \frac{48 \times 5 \times 5}{3 \times 2} = 200$$

$$\therefore 1\% \text{ of } 200$$

$$= 200 \times \frac{1}{100} = 2$$

68. (1) Required sum

$$= \frac{24.2 \times 16}{100} + \frac{2.42 \times 10}{100}$$

$$= 3.872 + 0.242$$

$$= 4.114$$

69. (2) $x\%$ of 15 hours = 18 seconds

$$\Rightarrow x\% \text{ of } 15 \times 60 \times 60 \text{ seconds} = 18 \text{ seconds}$$

$$\Rightarrow \frac{15 \times 60 \times 60 \times x}{100} = 18$$

$$\Rightarrow x = \frac{18}{15 \times 6 \times 6} = \frac{1}{30} \%$$

70. (3) $80 \times \frac{y}{100} \times \frac{x}{100}$

$$= \frac{900 \times 25}{100}$$

$$\Rightarrow \frac{xy \times 80}{10000} = 9 \times 25$$

$$\Rightarrow xy = \frac{9 \times 25 \times 10000}{80}$$

$$= 28125$$

71. (1) Required time = $\frac{35 \times 100}{140}$

$$= 25 \text{ days}$$

72. (2) According to the question,

$$\frac{60A}{100} = \frac{30B}{100}$$

$$\Rightarrow \frac{3A}{5} = \frac{3B}{10} = \frac{3}{10} \times \frac{40}{100} C$$

$$\Rightarrow \frac{3A}{5} = \frac{3C}{25} = \frac{3}{25} \times A \times \frac{x}{100}$$

$$\Rightarrow \frac{3}{5} = \frac{3x}{2500}$$

$$\Rightarrow 5x = 2500$$

$$\Rightarrow x = \frac{2500}{5} = 500$$

73. (4) Total staff strength in the office = 100 (let)

$$\text{Females} = 40$$

$$\text{Males} = 60$$

$$\text{Married females} = \frac{40 \times 70}{100} = 28$$

$$\text{Unmarried females} = 40 - 28 = 12$$

$$\text{Unmarried males} = 30$$

$$\therefore \text{Unmarried staff}$$

$$= 30 + 12 = 42$$

$$\text{i.e. } 42\%$$

74. (3) Let the number be x .

According to the question,

$$\frac{x \times 50}{100} + 50 = x$$

$$\Rightarrow \frac{x}{2} + 50 = x$$

$$\Rightarrow x - \frac{x}{2} = 50$$

$$\Rightarrow \frac{x}{2} = 50$$

$$\Rightarrow x = 100$$

75. (4) Let the required amount be Rs. x .

According to the question,

$$90 \times 83\frac{1}{3}\% = x \times 60\%$$

$$\Rightarrow 90 \times \frac{250}{3} = x \times 60$$

$$\Rightarrow x = \frac{30 \times 250}{60} = \text{Rs. } 125$$

76. (1) Let the whole number be x .

According to the question,

$$51\% \text{ of } x = 714$$

$$\Rightarrow \frac{x \times 51}{100} = 714$$

$$\Rightarrow x = \frac{714 \times 100}{51} = 1400$$

$$\therefore 25\% \text{ of } 1400$$

$$= \frac{1400 \times 25}{100} = 350$$



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77. (3) Initial price of eggs = Rs. x per dozen (let).

$$\text{New price} = \text{Rs. } \frac{3x}{4} \text{ per dozen}$$

According to the question,

$$\frac{162}{\frac{3x}{4}} - \frac{162}{x} = 2$$

$$\Rightarrow \frac{162 \times 4}{3x} - \frac{162}{x} = 2$$

$$\Rightarrow \frac{216}{x} - \frac{162}{x} = 2$$

$$\Rightarrow \frac{54}{x} = 2$$

$$\Rightarrow 2x = 54$$

$$\Rightarrow x = \text{Rs. } 27 \text{ per dozen}$$

78. (2) Required per cent

$$= \frac{30}{24 \times 60} \times 100 \approx 2.083$$

79. (4) Initial number of mangoes = 300

$$\text{Number of remaining mangoes} = 300 - 75 = 225$$

Required per cent

$$= \frac{225}{300} \times 100 = 75\%$$

80. (1) Required per cent

$$= \left(\frac{3.5}{7.5} \times 100 \right)$$

$$= \frac{3500}{75} = \frac{140}{3}$$

$$= 46\frac{2}{3}\%$$

81. (3) Discount percent

$$= \frac{1}{5} \times 100 = 20\%$$

82. (2) B's income = Rs. 100

$$\therefore \text{A's income} = \text{Rs. } 125$$

\therefore Required percent

$$= \frac{125 - 100}{125} \times 100$$

$$= \frac{2500}{125} = 20\%$$

83. (2) 1 day = 24 hours

$$= (24 \times 60) \text{ minutes}$$

\therefore Required per cent

$$= \frac{36}{24 \times 60} \times 100 = 2.5\%$$

84. (2) Let the larger number be x .

\therefore Smaller number

$$= \frac{25x}{100} = \frac{x}{4}$$

According to the question,

$$x - \frac{x}{4} = 12$$

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

$$\Rightarrow 3x = 12 \times 4$$

$$\Rightarrow x = \frac{12 \times 4}{3} = 16$$

85. (3) Initial number of students in the class = x

According to the question,

$$x \times \frac{120}{100} = 66$$

$$\Rightarrow x = \frac{66 \times 100}{120} = 55$$

86. (3) Required per cent

$$= \left(\frac{20}{100 + 20} \right) \times 100$$

$$= \frac{2000}{120} = \frac{50}{3} = 16\frac{2}{3}\%$$

87. (2) Number of goats before flood = x (let)

According to the question,

$$x \times \frac{88}{100} \times \frac{95}{100} = 8360$$

$$\Rightarrow x = \frac{8360 \times 100 \times 100}{88 \times 95}$$

$$= 10000$$

88. (3) Let, C = 100

$$\therefore B = 100 \times \frac{25}{100} = 25$$

$$\therefore A = \frac{20}{100} \times 25 = 5$$

$$\therefore x\% \text{ of } C = 5$$

$$\Rightarrow \frac{x}{100} \times 100 = 5$$

$$\Rightarrow x = 5$$

89. (3) Number of boys in the school

$$= \frac{1500 \times 56}{100} = 840$$

$$\text{Number of girls} = (1500 - 840) = 660$$

$$\text{Monthly fee of each boy}$$

$$= \text{Rs. } 540$$

$$\text{Monthly fee of each girl}$$

$$= \text{Rs. } \left(\frac{540 \times 75}{100} \right) = \text{Rs. } 405$$

$$\therefore \text{Total monthly fee of boys and girls}$$

$$= \text{Rs. } (840 \times 540 + 660 \times 405)$$

$$= \text{Rs. } (453600 + 267300)$$

$$= \text{Rs. } 720900$$

90. (1) Percentage of children

$$= (100 - 54 - 32)\%$$

$$= 14\%$$

According to the question,

$$\therefore 14\% = 196$$

$$\therefore 1\% = \frac{196}{14} = 14$$

$$\therefore 54\% = 54 \times 14 = 756 \text{ men}$$

91. (2) Expression

$$= \frac{25}{4}\% \text{ of } 1600 + \frac{25}{2}\% \text{ of } 800$$

$$= \frac{1600 \times 25}{400} + \frac{800 \times 25}{200}$$

$$= 100 + 100 = 200$$

92. (3) Required percent

$$= \frac{25}{100} \times 100 = 25\%$$

93. (3) Required per cent

$$= \frac{40}{80} \times 100 = 50$$

94. (4) Correct answer

$$= 1 - \left(\frac{1}{4} + \frac{1}{5} \right)$$

$$= 1 - \left(\frac{5+4}{20} \right)$$

$$= 1 - \frac{9}{20} = \frac{11}{20}$$

$$\text{Incorrect answer} = 0.45 = \frac{45}{100}$$

$$= \frac{9}{20}$$

$$\text{Error} = \frac{11}{20} - \frac{9}{20} = \frac{2}{20} = \frac{1}{10}$$

$$\text{Percentage error} = \left(\frac{\frac{1}{10}}{\frac{11}{20}} \right) \times 100$$

$$= \frac{1}{10} \times \frac{20}{11} \times 100 = \frac{200}{11}\%$$

TYPE-II

1. (1) Let y be 100.

$$\therefore x = 75$$

\therefore Required percentage

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

Aliter : Using Rule 9,

Required percentage

$$= \frac{25}{(100 - 25)} \times 100\%$$

$$= \frac{25}{75} \times 100\%$$

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



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2. (1) Using Rule 8,
Required per cent decrease

$$= \frac{10}{100 + 10} \times 100$$

$$= \frac{10}{110} \times 100 = 9\frac{1}{11}\%$$

3. (4) Using Rule 8,
If the first value is $r\%$ more than the second value, then second

is $\left[\frac{r}{100+r} \times 100\right]\%$ less than the first value.

Here $r = 10\%$.

\therefore Required percentage

$$= \frac{10}{110} \times 100 = \frac{100}{11} = 9\frac{1}{11}\%$$

4. (2) Using Rule 9,
Required percentage

$$= \frac{20}{100 - 20} \times 100 = 25\%$$

5. (3) Using Rule 8,
Required percentage

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

6. (1) Let the larger number be x
 \Rightarrow According to question,
 $x - 20 = 20\%$ of x

$$\text{or, } x - 20 = \frac{x}{5}$$

$$\text{or, } x - \frac{x}{5} = 20$$

$$\text{or, } 5x - x = 20 \times 5$$

$$\text{or, } 4x = 20 \times 5$$

$$\Rightarrow x = 5 \times 5 = 25$$

7. (4) y is 10% more than 125

$$= 125 \times \frac{110}{100} = 137.5 = y$$

and x is 10% less than y

$$x = \frac{90}{100} \times y = \frac{90}{100} \times 137.5$$

$$= 123.75$$

8. (4) If the third number is 100, then the numbers are

$$100 + \frac{25}{2} = \frac{225}{2} \text{ and } 125 \text{ respectively.}$$

\therefore First number as a percentage of the second

$$= \frac{225}{2 \times 125} \times 100 = 90$$

Rule : If two numbers are respectively $x\%$ and $y\%$ more than a third number the first as a per cent of second is

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

9. (2) Required number

$$= 60\% \text{ of } 90 = \frac{90 \times 60}{100} = 54$$

10. (1) Third number = 100

First number = 70

Second number = 63

\therefore Required percentage

$$= \frac{7}{70} \times 100 = 10$$

11. (2) Let the number be x

$$\text{then, } x \times \frac{90}{100} = 30$$

$$\Rightarrow x = \frac{3000}{90} = \frac{100}{3} = 33\frac{1}{3}$$

12. (3) According to the question,
Required difference

$$= \text{Rs. } \left(312 \times \frac{200}{3}\% - 200\right)$$

$$= \text{Rs. } \left(312 \times \frac{200}{300} - 200\right)$$

$$= \text{Rs. } (208 - 200) = \text{Rs. } 8$$

13. (1) Let B's income be Rs. 100.

\therefore A's income = Rs. 125

\therefore Required per cent

$$= \left(\frac{100}{125} \times 100\right) = 80\%$$

14. (2) Required per cent

$$= \left(\frac{r}{100+r} \times 100\right)\%$$

$$= \frac{50}{100+50} \times 100$$

$$= \frac{100}{3} = 33\frac{1}{3}\%$$

15. (3) Required per cent

$$= \frac{40}{100-40} \times 100$$

$$= \frac{40 \times 100}{60} = \frac{200}{3} = 66\frac{2}{3}\%$$

16. (2) Required per cent

$$= \left(-\frac{x^2}{100}\right)\%$$

$$= -\frac{10 \times 10}{100} = -1\%$$

Negative sign shows decrease.

17. (3) Length of Y = 1 foot

\therefore Length of X = 5 feet

Required per cent

$$= \left(\frac{5-1}{5}\right) \times 100 = 80\%$$

TYPE-III

1. (2) Savings = $100\% - 66\frac{2}{3}\%$

$$= 33\frac{1}{3}\% \therefore 33\frac{1}{3}\% \equiv ₹ 1200$$

$$\therefore 100\% \equiv \frac{1200}{100} \times 3 \times 100$$

$$= ₹ 3600$$

$$\therefore \text{Expenses} = 3600 - 1200$$

$$= ₹ 2400$$

Alter : Using Rule 20,

Here, $R = ₹ 1200$

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

Monthly income

$$= \frac{100}{100 - 66\frac{2}{3}} \times 1200$$

$$= \frac{100}{100 - \frac{200}{3}} \times 1200$$

$$= \frac{300}{100} \times 1200 = ₹ 3600$$

Expenses = Income - savings

$$= 3600 - 1200 = 2400$$

2. (2) Suppose income of A = ₹ 100

\therefore Income of B = ₹ 125

Income of C = ₹ 150

\therefore Required percentage

$$= \frac{50 \times 100}{100} = 50\%$$

3. (3) Using Rule 9,

Required percentage

$$= \frac{x}{100-x} \times 100$$

$$= \frac{40}{60} \times 100 = \frac{200}{3}$$

$$= 66.66\%$$

4. (2) Using Rule 8,

Tricky approach

Required answer

$$= \left(\frac{20}{100+20} \times 100\right)\%$$

$$= \left(\frac{20}{120} \times 100\right)\% = \frac{50}{3}\% = 16\frac{2}{3}\%$$

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5. (1) Using Rule 8,

Tricky approach

$$x = \left(\frac{10}{100+10} \times 100 \right) \%$$

$$= \left(\frac{1000}{110} \right) \% = \left(\frac{100}{11} \right) \% = 9\frac{1}{11} \%$$

Note : If A is $r\%$ more than B, then B is

$$\left(\frac{r}{100+r} \times 100 \right) \% \text{ less than A.}$$

6. (1) Using Rule 8,

Tricky approach

$$\text{Required \%} = \frac{R \times 100}{100 \pm R}$$

$$\therefore \text{Required \%} = \frac{12.5 \times 100}{100 + 12.5}$$

$$= \frac{1250}{112.5} = \frac{100}{9} = 11\frac{1}{9}$$

7. (3) Let A's income = ₹ a

and B's income = ₹ b

$$a \times 60\% = b \times 75\%$$

$$\Rightarrow a \times 4 = 5 \times b$$

$$\Rightarrow \frac{b}{a} = \frac{4}{5}$$

$$\text{Now, } b = a \times x\%$$

$$\Rightarrow \frac{b}{a} = \frac{x}{100} \Rightarrow \frac{x}{100} = \frac{4}{5}$$

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

8. (4) Let income be ₹ 100

$$\therefore \text{Sum given to elder son}$$

$$= 20\% \text{ of ₹ } 100 = ₹ 20$$

$$\text{Remaining Sum} = \text{Rs. } 80$$

$$\text{Sum given to younger son}$$

$$= 30\% \text{ of ₹ } 80 = ₹ 24$$

$$\text{Remaining sum}$$

$$= \text{Rs. } (80 - 24) = \text{Rs. } 56$$

$$\text{Sum given to the trust}$$

$$= 10\% \text{ of ₹ } 56 = ₹ 5.6$$

$$\therefore \text{Remaining sum}$$

$$= ₹ (56 - 5.6) = ₹ 50.4$$

$$\therefore \text{When ₹ } 50.4 \text{ remains, total income} = ₹ 100$$

$$\therefore \text{When ₹ } 10080 \text{ remains, total income}$$

$$= \frac{100 \times 10080}{50.4} = ₹ 20000$$

Aliter : Using Rule 20,

$$\text{Here, } R = ₹ 10080$$

$$x = 20\%,$$

$$y = 30\%$$

$$\text{and } z = 10\%$$

$$\text{Monthly income}$$

$$= \frac{100}{100 - (20 + 24 + 5.6)} \times 10080$$

$$= \frac{1008000}{100 - 49.6}$$

$$= \frac{1008000}{50.4} = 20,000$$

9. (2) Radha's total percentage expenditure

$$= (40 + 20 + 10 + 10)\% = 80\%$$

$$\text{Percentage savings}$$

$$= 100 - 80 = 20\%$$

$$\text{Now, } 20\% \text{ of her total salary}$$

$$= 1500$$

$$\text{Her total salary} = \frac{1500 \times 100}{20}$$

$$= ₹ 7500$$

Aliter : Using Rule 20,

$$\text{Here,}$$

$$\text{Monthly income}$$

$$= \frac{100}{100 - (40 + 20 + 10 + 10)} \times 1500$$

$$= \frac{150000}{100 - 80}$$

$$= \frac{150000}{20} = ₹ 7500$$

10. (3) Suppose monthly income

$$= ₹ x$$

$$\text{Then, } \frac{8}{3} \% \text{ of } x = 72$$

$$\Rightarrow x \times \frac{8}{300} = 72$$

$$\Rightarrow \frac{72 \times 300}{8} = ₹ 2700$$

11. (2) Let the required income be ₹ x

$$\text{Average monthly income}$$

$$= ₹ \left(\frac{80800}{16} \right) = ₹ 5050$$

$$\therefore x = 120\% \text{ of } 5050$$

$$= ₹ \left(\frac{120}{100} \times 5050 \right) = ₹ 6060$$

12. (4) Using Rule 8,

$$\text{Required percentage}$$

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

13. (1) Let man's salary be ₹ x .

$$\therefore \text{His expenditure on items of daily use}$$

$$= \frac{25}{2} \% \text{ of } x$$

$$= \frac{25 \times x}{200} = \frac{x}{8}$$

$$\text{So, remaining amount}$$

$$= x - \frac{x}{8} = ₹ \frac{7x}{8}$$

$$\text{Expenditure on house rent}$$

$$= 30\% \text{ of ₹ } \frac{7x}{8}$$

$$= \frac{30}{100} \times \frac{7x}{8} = ₹ \frac{21x}{80}$$

$$\text{Now, remaining amount}$$

$$= \frac{7x}{8} - \frac{21x}{80}$$

$$= \frac{70x - 21x}{80} = ₹ \frac{49x}{80}$$

$$\text{According to the question,}$$

$$\therefore \frac{49x}{80} = 2940$$

$$\Rightarrow x = \frac{2940 \times 80}{49}$$

$$= ₹ 4800$$

Aliter : Using Rule 20,

$$\text{His salary}$$

$$= \frac{100 \times 2940}{100 - \left(\frac{25}{2} + 26.25 \right)}$$

$$= \frac{100 \times 2940}{100 - (12.5 + 26.25)}$$

$$= \frac{294000}{61.25} = ₹ 4800$$

14. (3) Original savings

$$= ₹ (13500 - 9000)$$

$$= ₹ 4500$$

$$\text{New income} = 114\% \text{ of ₹ } 13500$$

$$= ₹ (114 \times 135)$$

$$= ₹ 15390$$

$$\text{New expenditure}$$

$$= 107\% \text{ of ₹ } 9000$$

$$= ₹ (107 \times 90)$$



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$$= ₹ 9630$$

New savings

$$= ₹ (15390 - 9630)$$

$$= ₹ 5760$$

∴ Percentage increase in savings

$$= \frac{5760 - 4500}{4500} \times 100$$

$$= \frac{1260}{45} = 28\%$$

15. (2) Using Rule 9,
Required percentage of increase

$$= \frac{r}{100 - r} \times 100$$

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

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

16. (3) 10% of A = 15% of B
= 20% of C

$$\Rightarrow 10A = 15B = 20C$$

$$\Rightarrow \frac{10A}{60} = \frac{15B}{60} = \frac{20C}{60}$$

$$\Rightarrow \frac{A}{6} = \frac{B}{4} = \frac{C}{3}$$

$$\therefore A : B : C = 6 : 4 : 3$$

$$\therefore 6x + 4x + 3x = 7800$$

$$\Rightarrow 13x = 7800$$

$$\Rightarrow x = \frac{7800}{13} = 600$$

$$\therefore B's \text{ income} = 4x$$

$$= 600 \times 4 = ₹ 2400$$

17. (3) Using Rule 9,

Tricky approach

Required percentage

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

18. (2) Using Rule 8,

Tricky approach

Required percentage

$$= \left(\frac{50}{100 + 50} \times 100 \right) \%$$

$$= \frac{50}{150} \times 100$$

$$= \frac{100}{3} = 33\frac{1}{3}\%$$

19. (1) Let Tulsiram's salary be ₹ x.

$$\therefore \frac{x \times 4}{100} = 720$$

$$\Rightarrow x = \frac{720 \times 100}{4}$$

$$= ₹ 18000$$

∴ Kashyap's salary

$$= ₹ \left(\frac{100}{120} \times 18000 \right) = ₹ 15000$$

20. (2) Let B's salary = ₹ 100

∴ C's salary = ₹ 400

and A's salary = ₹ 40

∴ Required percentage

$$= \frac{40}{400} \times 100 = 10\%$$

21. (2) Using Rule 9,

Tricky approach

Required percentage

$$= \frac{50}{100 - 50} \times 100 = 100\%$$

Otherwise \Rightarrow Let's B income

= ₹ 100 & A income = ₹ 50.

$$\text{Required } \% = \frac{100 - 50}{50} \times 100$$

$$= 100\%$$

22. (2) Using Rule 8,

∴ Required percentage

$$= \frac{20}{100 + 20} \times 100$$

$$= \frac{50}{3} = 16\frac{2}{3}\%$$

23. (3) Basic pay of the employee

$$= 11925 \times \frac{100}{265} = ₹ 4500$$

24. (2) Using Rule 8,

Required percentage

$$= \frac{25}{100 + 25} \times 100 = \frac{25}{125} \times 100$$

$$= 20\%$$

25. (3) Effective change

$$= (-25 + 25 - \frac{25 \times 25}{100}) \%$$

$$= -6.25\%$$

The negative sign shows decrease.

Aliter : Using Rule 3,

Percentage decrease

$$= \frac{a^2}{100} \% = \frac{(25)^2}{100}$$

$$= \frac{625}{100} = 6.25\%$$

26. (2) If Shyam's salary be ₹ x, then

$$\frac{22 \times x}{100} = 1540$$

$$\Rightarrow x = \frac{1540 \times 100}{22} = ₹ 7000$$

∴ Ram's savings

$$= \frac{14 \times 7000}{100} = ₹ 980$$

27. (1) Using Rule 8,
Required percentage

$$= \frac{25}{125} \times 100 = 20\%$$

28. (3) Let man's income = ₹ 100
Savings = 100 - 75 = ₹ 25
New income = ₹ 120
Savings

$$= 120 - \frac{75 \times 115}{100} = 120 - \frac{345}{4}$$

$$= \frac{480 - 345}{4} = ₹ \frac{135}{4}$$

Increase in savings

$$= \frac{135}{4} - 25 = ₹ \frac{35}{4}$$

∴ Percentage increase

$$= \frac{35}{25} \times 100 = 35\%$$

29. (3) Let Nitin's initial salary be 100
After 10% reduction,
New salary = 90% of 100 = ₹ 90
Again after 10% increase

$$\text{New salary} = \frac{90 \times 110}{100} = ₹ 99$$

∴ Percentage decrease = 1 %

30. (2) Suppose monthly income of the man is Rs. x.

Expenditure on food

$$= 40\% \text{ of } x = ₹ \frac{2x}{5}$$

$$\text{Remaining amount} = x - \frac{2x}{5}$$

$$= ₹ \frac{3x}{5}$$

Expenditure on transport

$$= \frac{1}{3} \times \frac{3x}{5} = ₹ \frac{x}{5}$$

Remaining amount

$$= \frac{3x}{5} - \frac{x}{5} = \frac{2x}{5}$$

According to question

$$\frac{1}{2} \times \frac{2x}{5} = 4500$$

$$\therefore x = 4500 \times 5 = ₹ 22,500$$

31. (1) If the monthly income of A is ₹ x, then

$$\frac{x \times 80}{100} = 6000$$

$$\Rightarrow x = \frac{6000 \times 100}{80} = ₹ 7500$$

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- \therefore Savings = 7500 - 6000
= ₹ 1500
- 32.** (2) Using Rule 3,
Change in salary
 $= -\frac{10 \times 10}{100} = -1\%$
Negative sign shows decrease.
- 33.** (4) If the total salary of Kishan be ₹ x , then
 $x \times \frac{33}{100} = 2310$
 $\Rightarrow x = \frac{2310 \times 100}{33} = ₹ 7000$
- 34.** (4) Salary of clerk in 1974
 $= \frac{3660 \times 100}{100 + 20} = ₹ 3050$
- 35.** (4) Total percentage of expenditure
 $= \left(20 + \frac{80 \times 70}{100}\right)\% = 76\%$
If total income be ₹ x , then
 $x \times \frac{24}{100} = 1800$
 $\Rightarrow x = \frac{1800 \times 100}{24} = ₹ 7500$
Aliter : Using Rule 20,
His monthly income
 $= \frac{1800}{100 - (20 + 56)} \times 100$
 $= \frac{180000}{100 - 76}$
 $= \frac{180000}{24} = ₹ 7500$
- 36.** (3) Arbind's income = ₹ 100
Expenditure = ₹ 75
Savings = ₹ 25
New income = ₹ 120
Expenditure = 75 + 7.5 = ₹ 82.5
Savings = 120 - 82.5 = ₹ 37.5
Required percentage
 $= \frac{37.5 - 25}{25} \times 100 = 50\%$
- 37.** (1) Man's previous salary
 $= 24000 \times \frac{100}{120} = ₹ 20000$
- 38.** (2) Using Rule 9,
Required per cent increase
 $= \left(\frac{r}{100 - r} \times 100\right)\%$
 $= \frac{10}{100 - 10} \times 100 = \frac{100}{9}$
 $= 11\frac{1}{9}\%$

- 39.** (4) Using Rule 8,
Required percentage
 $= \frac{R}{100 + R} \times 100$
 $= \frac{50}{100 + 50} \times 100$
 $= \frac{50}{150} \times 100$
 $= \frac{100}{3} = 33\frac{1}{3}\%$
- 40.** (2) Percentage of expenditure on food and education
 $= 35 + 5 = 40\%$
If the monthly salary of X be Rs. x , then
 $\frac{x \times 40}{100} = 17600$
 $\Rightarrow x \times 40 = 17600 \times 100$
 $\Rightarrow x = \frac{1760000}{40} = ₹ 44000$
- 41.** (1) A's monthly salary = Rs. x
 \therefore B's monthly salary
= Rs. (40000 - x)
A spends 85% of his income.
 \therefore A's savings = $\frac{15x}{100} = \text{Rs. } \frac{3x}{20}$
B's savings = (40000 - x) $\times \frac{5}{100}$
 $= \text{Rs. } \left(\frac{40000 - x}{20}\right)$
 $\therefore \frac{3x}{20} = \frac{40000 - x}{20}$
 $\Rightarrow 3x = 40000 - x$
 $\Rightarrow 4x = 40000$
 $\Rightarrow x = \frac{40000}{4} = \text{Rs. } 10000$
- 42.** (3) C's monthly salary
 $= \frac{600000}{12} = \text{Rs. } 50000$
B's monthly salary
 $= \frac{50000 \times 40}{100}$
 $= \text{Rs. } 20000$
 $\frac{1}{4}$ of A's monthly salary
 $= \frac{20000 \times 80}{100}$
 \Rightarrow A's monthly salary
= Rs. (16000 \times 4)
= Rs. 64000

- 43.** (1) Let the third number be 100.
 \therefore First number = 70
Second number = 63
Required percent
 $= \frac{70 - 63}{70} \times 100$
 $= \frac{7}{70} \times 100 = 10\%$
- 44.** (2) Man's income = Rs. 100 (let).
 \therefore Expenditure = Rs. 75
Savings = Rs. 25
New income = Rs. 120
Expenditure = $\frac{75 \times 110}{100}$
= Rs. 82.5
Savings = Rs. (120 - 82.5)
= Rs. 37.5
 \therefore Required percentage
 $= \left(\frac{37.5 - 25}{25}\right) \times 100$
 $= \frac{12.5 \times 100}{25} = 50\%$
- 45.** (2) Let Ram Babu's salary be Rs. x .
Remaining amount after donations to charity
= Rs. $\frac{97x}{100}$
After depositing money in the bank,
Remaining amount
 $= \frac{97x}{100} \times \frac{88}{100}$
 $\therefore \frac{97x \times 88}{10000} = 12804$
 $\Rightarrow x = \frac{12804 \times 10000}{97 \times 88}$
= Rs. 15000
- 46.** (3) Amount with Soham
= Rs. x (let).
 \therefore Amount with Mukesh
= Rs. $2x$
Amount with Pankaj = $\frac{100x}{150}$
= Rs. $\frac{2x}{3}$
 \therefore Soham : Mukesh : Pankaj = x
 $: 2x : \frac{2x}{3} = 3 : 6 : 2$
Sum of the terms of ratio
= 3 + 6 + 2 = 11



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- \therefore Amount with Mukesh
 $= \text{Rs. } \left(\frac{6}{11} \times 330 \right)$
 $= \text{Rs. } 180$
47. (2) Let man's income be Rs. 100.
 \therefore Expenditure = Rs. 75
 Savings = Rs. 25
Case-II,
 Man's income = Rs. 120
 Expenditure = $\left(\frac{75 \times 110}{100} \right)$
 $= \text{Rs. } 82.5$
 Savings = $120 - 82.5 = \text{Rs. } 37.5$
 \therefore Percentage increase
 $= \left(\frac{37.5 - 25}{25} \right) \times 100$
 $= \frac{12.5}{25} \times 100 = 50\%$
48. (1) Christy's income = Rs. x (let)
 Amount given to orphanage
 $= \text{Rs. } \frac{x}{10}$
 Remaining amount = Rs. $\frac{9x}{10}$
 Remaining amount after depositing in bank
 $= 80\% \text{ of } \frac{9x}{10}$
 $= \text{Rs. } \left(\frac{9x}{10} \times \frac{80}{100} \right)$
 $= \text{Rs. } \frac{18x}{25}$
 According to the question,
 $\frac{18x}{25} = 7200$
 $\Rightarrow 18x = 25 \times 7200$
 $\Rightarrow x = \frac{25 \times 7200}{18} = \text{Rs. } 10000$
49. (2) Let the number of male employees in the firm be x and that of female employees be y .
 According to the question,
 $\frac{5200 \times x + 4200 \times y}{x + y} = 5000$
 $\Rightarrow 52x + 42y = 50(x + y)$
 $\Rightarrow 52x + 42y = 50x + 50y$
 $\Rightarrow 52x - 50x = 50y - 42y$
 $\Rightarrow 2x = 8y$
 $\Rightarrow x = 4y$

- $\therefore x + y = 4y + y = 5y$
 \therefore Required percent
 $= \frac{y}{5y} \times 100$
 $= 20\%$
50. (*) $22 : 25 = \frac{22}{25} \times 100 = 88\%$
 \therefore Percentage effect
 $= \left(88 - \frac{80}{3} - \frac{88 \times 80}{300} \right) \%$
 $= \left(88 - \frac{80}{3} - \frac{704}{30} \right) \%$
 $= \left(\frac{2640 - 800 - 704}{30} \right) \%$
 $= \frac{1136}{30} = 37.86\% \text{ increase}$
51. (3) Mahesh's income = Rs. 100 (let).
 \therefore Mohan's income = Rs. 250
 Required per cent
 $= \left(\frac{250 - 100}{250} \right) \times 100\%$
 $= \left(\frac{1500}{25} \right) \% = 60\%$
52. (1) Let person's income be Rs. 100.
 Expenses = Rs. 60
 Savings = Rs. 40
 New income = Rs. 120
 Expenses = Rs. $\left(\frac{120 \times 70}{100} \right)$
 $= \text{Rs. } 84$
 Savings = Rs. $(120 - 84)$
 $= \text{Rs. } 36$
 \therefore Required percent decrease
 $= \frac{40 - 36}{40} \times 100 = \frac{400}{40} = 10\%$
53. (1) Q's salary = Rs. 100 (let).
 \therefore P's salary = 125
 \therefore Required per cent
 $= \left(\frac{125 - 100}{125} \right) \times 100$
 $= \frac{25 \times 100}{125} = 20\%$
54. (2) Required per cent
 $= \left(\frac{40}{100 - 40} \right) \times 100$
 $= \frac{4000}{60} = \frac{200}{3} = 66\frac{2}{3} \%$

55. (1) Effect on percentage
 $= - \frac{x^2}{100} \%$
 $= \left(\frac{-50 \times 50}{100} \right) \%$
 $= -25\%$
 Negative sign shows decrease.
56. (4) Let the man's income be Rs. x .
 According to the question,
 $x \times \frac{15}{100} = 75$
 $\Rightarrow x = \frac{75 \times 100}{15} = \text{Rs. } 500$
57. (3) B's salary = Rs. 100 (let)
 \therefore A's salary = Rs. 130
 \therefore Required percent = $\frac{30}{130} \times 100$
 $= \frac{300}{13} = 23.07\%$
58. (2) Number of officers = x .
 Number of remaining employees = y .
 According to the question,
 $8840(x + y) = 15000x + 8000y$
 $\Rightarrow 8840x + 8840y = 15000x + 8000y$
 $\Rightarrow 15000x - 8840x = 8840y - 8000y$
 $\Rightarrow 6160x = 840y$
 $\Rightarrow \frac{x}{y} = \frac{840}{6160} = \frac{84}{616} = \frac{3}{22}$
 \therefore Required per cent
 $= \frac{3}{25} \times 100 = 12\%$
59. (2) Let annual salary of Sachdev before increase be Rs. x .
 According to the question,
 $x \times \frac{105}{100} = 15120$
 $\Rightarrow x = \frac{15120 \times 100}{105}$
 $= \text{Rs. } 14400$
 \therefore Required monthly salary
 $= \text{Rs. } \left(\frac{14400}{12} \right) = \text{Rs. } 1200$

PERCENTAGE

TYPE-IV

1. (1) Let B = 100

∴ According to question,
A is 40% greater than B.

$$\therefore A = 140$$

∴ B is 20% less than C

$$\therefore 0.8C = 100$$

$$\therefore C = 125$$

$$\therefore A : C = 140 : 125 = 28 : 25$$

2. (1) 10% of m = 20% of n

$$\Rightarrow \frac{10}{100} \times m = \frac{20}{100} \times n$$

$$\Rightarrow \frac{m}{n} = \frac{10}{5} = \frac{2}{1}$$

$$\therefore m : n = 2 : 1$$

3. (1) 5 : 4 when expressed as per

$$\text{cent} = \frac{5}{4} \times 100 = 125\%$$

4. (3) Let the number of boys and girls in the college be $3x$ and $2x$ respectively. Number of minor boys

$$= 3x \times \frac{80}{100} = \frac{12x}{5}$$

Number of minor girls

$$= 2x \times \frac{75}{100} = \frac{3x}{2}$$

Total number of minor students

$$= \frac{12x}{5} + \frac{3x}{2} = \frac{24x + 15x}{10} = \frac{39x}{10}$$

Required percentage

$$= \frac{39x}{10 \times 5x} \times 100 = 78\%$$

(As total students = $3x + 2x$)

5. (4) Let the number of boys and girls be $4x$ and x respectively. Number of boys who hold scholarship.

$$= \frac{75}{100} \times 4x = 3x$$

and number of girls who hold scholarship

$$= \frac{70 \times x}{100} = \frac{7x}{10}$$

Number of students who do not hold scholarship

$$= 5x - 3x - \frac{7x}{10} = 2x - \frac{7x}{10}$$

$$= \frac{20x - 7x}{10} = \frac{13x}{10}$$

The required percentage

$$= \frac{13x}{10} \times 100$$

$$= \frac{13x}{10 \times 5x} \times 100 = 26\%$$

6. (1) Let the numbers be $2x$ and $3x$.

According to the question,

$$\left(\frac{20}{100} \times 2x \right) + 20$$

$$= \left(\frac{10}{100} \times 3x \right) + 25$$

$$\Rightarrow \frac{2x}{5} + 20 = \frac{3x}{10} + 25$$

$$\Rightarrow \frac{2x}{5} - \frac{3x}{10} = 25 - 20$$

$$\Rightarrow \frac{4x - 3x}{10} = 5 \Rightarrow x = 50$$

∴ The smaller number

$$= 2x = 100$$

7. (3) Let the third number be 100.

∴ First number = 120

Second number = 150

∴ Required ratio

$$= \frac{120}{150} = \frac{4}{5} \text{ or } 4 : 5$$

8. (3) Let the numbers be x and y and x is greater than y . Then

$$x - y = 45\% \text{ of } (x + y)$$

$$\Rightarrow x - y = \frac{45}{100}(x + y)$$

$$\Rightarrow x - y = \frac{9}{20}(x + y)$$

$$\Rightarrow 20x - 20y = 9x + 9y$$

$$\Rightarrow 20x - 9x = 20y + 9y$$

$$\Rightarrow 11x = 29y$$

$$\Rightarrow \frac{x}{y} = \frac{29}{11}$$

$$\text{or } 29 : 11$$

9. (4) 30% of A = 25% of B

$$\Rightarrow 30A = 25B$$

$$\Rightarrow A : B = 25 : 30 = 5 : 6$$

Again,

$$25\% \text{ of } B = 20\% \text{ of } C$$

$$\Rightarrow 25B = 20C$$

$$\Rightarrow 5B = 4C$$

$$\Rightarrow B : C = 4 : 5$$

$$\therefore A : B : C = 5 \times 4 : 4 \times 6 : 6 \times 5$$

$$= 20 : 24 : 30 = 10 : 12 : 15$$

10. (2) Let number of boys be x .

$$\text{Then, } x + \frac{120}{100}x = 66$$

$$\Rightarrow x + \frac{6x}{5} = 66$$

$$\Rightarrow \frac{5x + 6x}{5} = 66$$

$$\Rightarrow x = \frac{66 \times 5}{11} = 30$$

∴ Number of girls

$$= 66 - 30 = 36$$

$$\therefore \text{New ratio} = 30 : (36 + 4)$$

$$= 30 : 40 = 3 : 4$$

11. (4) Let the number of boys = $3x$ and that of girls = $2x$
Number of boys who do not hold scholarship = 80% of $3x$

$$= 3x \times \frac{80}{100} = \frac{12x}{5}$$

Number of girls who do not hold scholarship

$$= 2x \times \frac{70}{100} = \frac{14x}{10}$$

∴ Number of students who do not hold scholarship

$$= \frac{12x}{5} + \frac{14x}{10} = \frac{24x + 14x}{10}$$

$$= \frac{38x}{10}$$

∴ Required percentage

$$= \frac{38x}{10} \times 100$$

$$= \frac{38}{10 \times 5} \times 100 = 76\%$$

12. (4) Let the initial expenses on rice, fish and oil be ₹ $12x$, ₹ $17x$ and ₹ $3x$ respectively.

∴ Total expenditure

$$= ₹ (12x + 17x + 3x)$$

$$= ₹ 32x$$

After increase,

Expenditure on rice

$$= \frac{120}{100} \times 12x = ₹ 14.4x$$



PERCENTAGE

Expenditure on fish

$$= \frac{130}{100} \times 17x = ₹ 22.1x$$

Expenditure on oil

$$= \frac{150}{100} \times 3x = ₹ 4.5x$$

Total expenditure

$$= ₹ (14.4x + 22.1x + 4.5x)$$

$$= ₹ 41x$$

$$\text{Increase} = ₹ (41x - 32x)$$

$$= ₹ 9x$$

∴ Percentage increase

$$= \frac{9x}{32x} \times 100 = \frac{225}{8} = 28\frac{1}{8}\%$$

13. (4) 20 % of A = 30 % of B

$$= \frac{1}{6} \text{ of } C$$

$$\Rightarrow \frac{20A}{100} = \frac{30B}{100} = \frac{C}{6}$$

$$\Rightarrow \frac{A}{5} = \frac{B}{10} = \frac{C}{6} = k \text{ (let)}$$

$$\Rightarrow A = 5k, B = \frac{10}{3}k, C = 6k$$

$$\therefore A : B : C = 5k : \frac{10k}{3} : 6k$$

$$= 15 : 10 : 18$$

14. (2) Increased train fare

$$= ₹ \left(\frac{120}{100} \times 30 \right) = ₹ 36$$

Increased bus fare

$$= ₹ \left(\frac{110}{100} \times 20 \right) = ₹ 22$$

∴ Required ratio = 36 : 22

$$= 18 : 11$$

15. (1) Let the numbers be x and y where $x > y$. Then,

$$x - y = \frac{15}{100}(x + y)$$

$$\Rightarrow x - y = \frac{3}{20}(x + y)$$

$$\Rightarrow 20x - 20y = 3x + 3y$$

$$\Rightarrow 20x - 3x = 20y + 3y$$

$$\Rightarrow 17x = 23y \Rightarrow \frac{x}{y} = \frac{23}{17}$$

16. (3) The raised price = $\frac{120}{100}$ of the

former price

∴ The householder must now con-

sume $\frac{100}{120}$ of the original amount

∴ The reduction in consumption

$$= \left(1 - \frac{100}{120} \right) \text{ of the original con-}$$

sumption = $\frac{1}{6}$ of the original con-

sumption

i.e. 1 : 6

Aliter : Using Rule 8,

Required percentage

$$= \left(\frac{20}{100 + 20} \right) \times 100$$

$$= \frac{20}{120} \times 100$$

$$= \frac{100}{6}\%$$

Required ratio = 1 : 6

17. (2) Let Rama's expenditure

$$= 5x$$

$$\text{Savings} = 3x$$

$$\therefore \text{Rama's income} = 5x + 3x = 8x$$

After increase,

$$\text{Rama's income} = \frac{112}{100} \times 8x$$

$$= 8.96x$$

Rama's expenditure

$$= \frac{5x \times 115}{100} = 5.75x$$

Rama's savings

$$= (8.96x - 5.75x)$$

$$= 3.21x$$

∴ Rama's saving per cent

$$= \left(\frac{3.21x - 3x}{3x} \right) \times 100$$

$$= \frac{0.21}{3} \times 100 = 7$$

18. (4) Let the numbers be $4x$ and $5x$. After corresponding increase or decrease, Required ratio

$$= 4x \times \frac{120}{100} : 5x \times \frac{80}{100}$$

$$= 12x : 10x$$

$$= 6 : 5$$

$$19. (4) \frac{A \times 60}{100} = B \times \frac{3}{4}$$

$$\Rightarrow A \times \frac{3}{5} = B \times \frac{3}{4}$$

$$\Rightarrow \frac{A}{B} = \frac{3}{4} \times \frac{5}{3} = 5 : 4$$

20. (1) Let $C = 100$

$$\therefore B = 80$$

$$A = \frac{80 \times 160}{100} = 128$$

$$\therefore A : C = 128 : 100 = 32 : 25$$

$$21. (2) (B - A) \times \frac{30}{100} = (B + A) \times \frac{18}{100}$$

$$\therefore \frac{B - A}{B + A} = \frac{18}{30} = \frac{3}{5}$$

By componendo and dividendo,

$$\frac{2B}{-2A} = \frac{3+5}{3-5} = \frac{8}{-2} = \frac{4}{-1}$$

$$\Rightarrow \frac{B}{A} = \frac{4}{1}$$

$$\Rightarrow A : B = 1 : 4$$

22. (1) Boys = 30, Girls = 20 (let)

Boys getting no scholarship = 24

Girls getting no scholarship = 15

$$\text{Sum} = 24 + 15 = 39$$

∴ Required percentage

$$= \frac{39}{50} \times 100 = 78\%$$

23. (4) Let the first number be x and second number be y .

$$\therefore y - \frac{60x}{100} = \frac{52y}{100}$$

$$\Rightarrow 100y - 60x = 52y$$

$$\Rightarrow 48y = 60x$$

$$\therefore \frac{x}{y} = \frac{48}{60} = \frac{4}{5} \text{ or } 4 : 5$$

$$24. (2) \text{ Women} = \frac{43}{83} \times 311250$$

$$= 161250$$

$$\text{Men} = 311250 - 161250$$

$$= 150000$$

∴ Total number of literate persons

$$= \frac{161250 \times 8}{100} + 150000 \times \frac{24}{100}$$

$$= 12900 + 36000 = 48900$$

25. (3) $7x - 5x = 200$

$$\Rightarrow 2x = 200 \Rightarrow x = 100$$

∴ Price of a pair of shoes

$$= 5x = 5 \times 100 = ₹ 500$$



PERCENTAGE

26. (1) $x \times \frac{15}{100} = y \times \frac{20}{100}$

$$\Rightarrow x \times 15 = y \times 20$$

$$\Rightarrow \frac{x}{y} = \frac{20}{15} = \frac{4}{3} = 4 : 3$$

27. (1) Boys in school = $2x$

Girls = $3x$

Students who are not scholarship holders :

$$\text{Boys} \Rightarrow \frac{2x \times 75}{100} = \frac{6x}{4}$$

$$\text{Girls} \Rightarrow \frac{3x \times 70}{100} = \frac{21x}{10}$$

Total students who do not hold

$$\text{scholarship} = \frac{6x}{4} + \frac{21x}{10}$$

$$= \frac{30x + 42x}{20} = \frac{72x}{20} = \frac{18x}{5}$$

\therefore Required percentage

$$= \frac{18x}{5x} \times 100 = 72\%$$

28. (1) Numbers $\Rightarrow A$ and B

$$\therefore \frac{A \times 5}{100} + \frac{B \times 4}{100}$$

$$= \frac{2}{3} \left(\frac{A \times 6}{100} + \frac{B \times 8}{100} \right)$$

$$\Rightarrow 5A + 4B = \frac{12A + 16B}{3}$$

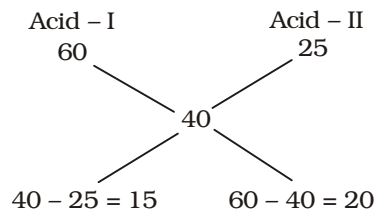
$$\Rightarrow 15A + 12B = 12A + 16B$$

$$\Rightarrow 15A - 12A = 16B - 12B$$

$$\Rightarrow 3A = 4B$$

$$\Rightarrow \frac{A}{B} = \frac{4}{3} = 4 : 3$$

29. (3) By alligation,



$$\therefore \text{Required ratio} = 15 : 20 = 3 : 4$$

30. (4) 50% of $x = 30\%$ of y

$$\Rightarrow \frac{x \times 50}{100} = \frac{y \times 30}{100}$$

$$\Rightarrow \frac{x}{y} = \frac{30}{50} = \frac{3}{5} = 3 : 5$$

31. (2) Boys in the village = $3x$

Girls in the village = $2x$

Villagers who appeared in the examination

$$= \frac{3x \times 30}{100} + \frac{2x \times 70}{100}$$

$$= \frac{9x}{10} + \frac{14x}{10} = \frac{23x}{10}$$

Villagers who did not appear in the examination

$$= \frac{3x \times 70}{100} + \frac{2x \times 30}{100}$$

$$= \frac{21x}{10} + \frac{6x}{10} = \frac{27x}{10}$$

$$\therefore \text{Required ratio} = \frac{23x}{10} : \frac{27x}{10}$$

$$= 23 : 27$$

32. (4) C.P. of 1 litre of milk = Rs. 100

\therefore Mixture sold for Rs. 125

$$= \frac{125}{100} = \frac{5}{4} \text{ litre}$$

$$\therefore \text{Quantity of water} = \frac{5}{4} - 1$$

$$= \frac{1}{4} \text{ litre}$$

$$\therefore \text{Required ratio} = \frac{1}{4} : 1$$

$$= 1 : 4$$

33. (1) Percentage of syrup

$$= \frac{3}{4} \times 100 = 75\%$$

34. (1) Let the numbers be $5x$ and $4x$ respectively

According to the question,

$$5x \times \frac{40}{100} = 12$$

$$\Rightarrow 2x = 12 \Rightarrow x = 6$$

$$\therefore 4x \text{ का } 50\% = 4 \times 6 \times \frac{1}{2} = 12$$

35. (2) According to the question,

$$x \times \frac{10}{100} = 3 \times y \times \frac{15}{100}$$

$$\Rightarrow 10x = 45y$$

$$\Rightarrow \frac{x}{y} = \frac{45}{10} = \frac{9}{2}$$

36. (2) Required per cent

$$= \frac{11}{10} \times 100 = 110\%$$

37. (2) Let the number of students in school be 100.

Boys $\Rightarrow 60$

Girls $\Rightarrow 40$

Students who do not hold scholarship :

$$\text{Boys} \Rightarrow \frac{60 \times 80}{100} = 48$$

$$\text{Girls} \Rightarrow \frac{40 \times 75}{100} = 30$$

$$\text{Required answer} = 48 + 30 = 78 \text{ i.e., } 78\%$$

38. (2) According to the question,

$$A \times 35\% = B \times 25\%$$

$$\Rightarrow \frac{A}{B} = \frac{25}{35} = \frac{5}{7}$$

TYPE-V

1. (2) Glycerine in mixture

= 40 litres

Water = 10 litres

Let x litres of pure glycerine is mixed with the mixture.

$$\therefore \frac{40 + x}{50 + x} = \frac{95}{100} = \frac{19}{20}$$

$$\Rightarrow 800 + 20x = 950 + 19x$$

$$\Rightarrow x = 950 - 800 = 150 \text{ litres.}$$

2. (4) Alcohol in original solution

$$= \frac{40}{100} \times 5 = 2 \text{ litres}$$

Water in original solution

= 3 litres

On adding 1 litre water, water becomes 4 litres.

Now, 6 litres of solution contains 2 litres of alcohol.

\therefore 100 litres of solution contains

$$= \frac{2}{6} \times 100$$

$$= \frac{100}{3} = 33\frac{1}{3} \% \text{ alcohol.}$$



PERCENTAGE

3. (1) In 12 litres salt solution,

$$\text{Salt} = \frac{7 \times 12}{100} = 0.84 \text{ units}$$

$$\text{Water} = \frac{93 \times 12}{100} = 11.16 \text{ units}$$

After evaporation,
Percentage of salt

$$= \frac{0.84}{8} \times 100 = 10.5\%$$

4. (2) In 60 litres of solution, Water

$$= \frac{60 \times 20}{100} = 12 \text{ litres}$$

On adding x litres of water,

$$\frac{12 + x}{60 + x} \times 100 = 40$$

$$\Rightarrow 60 + 5x = 120 + 2x$$

$$\Rightarrow 3x = 60$$

$$\Rightarrow x = 20 \text{ litres}$$

5. (2) Sugar in original solution

$$= \frac{75 \times 30}{100} = 22.5 \text{ gm}$$

Let x gm of sugar be mixed.

$$\therefore \frac{22.5 + x}{75 + x} \times 100 = 70$$

$$\Rightarrow 2250 + 100x = 75 \times 70 + 70x$$

$$\Rightarrow 2250 + 100x = 5250 + 70x$$

$$\Rightarrow 30x = 5250 - 2250 = 3000$$

$$\Rightarrow x = \frac{3000}{30} = 100 \text{ gm}$$

6. (3) In 30% alcohol solution,

$$\text{Alcohol} = \frac{30}{100} \times 6 = 1.8 \text{ litres}$$

Water = 4.2 litres

On mixing 1 litre of pure alcohol,
Percentage of water

$$= \frac{4.2}{7} \times 100 = 60\%$$

7. (2) In 4 kg of ore, iron = 0.9 kg.
 \therefore Quantity of ore for 60 kg of iron

$$= \frac{60 \times 4}{0.9}$$

$$= 266.67 \text{ kg}$$

8. (4) Let x ml of water be added.

$$\therefore \frac{20 + x}{100 + x} \times 100 = 50$$

$$\Rightarrow 40 + 2x = 100 + x$$

$$\Rightarrow x = 60 \text{ ml}$$

9. (1) In 1 litre i.e. 1000 ml of mixture,
Alcohol = 700 ml.
Water = 300 ml.
Let x ml of alcohol is mixed.

$$\therefore \frac{300}{1000 + x} \times 100 = 15$$

$$\Rightarrow 1000 + x = 2000$$

$$\Rightarrow x = 1000 \text{ ml.}$$

10. (4) In 10 litres of first type of liquid,

$$\text{Water} = \frac{1}{5} \times 10 = 2 \text{ litres}$$

In 4 litres of second type of liquid,

$$\text{Water} = 4 \times \frac{35}{100} = \frac{7}{5} \text{ litres}$$

Total amount of water

$$= 2 + \frac{7}{5} = \frac{17}{5} \text{ litres}$$

Required percentage

$$\frac{17}{5} \times 100 = \frac{340}{5} = 68\%$$

$$= \frac{170}{7} = 24 \frac{2}{7}\%$$

11. (4) Water content in 40 litres of

$$\text{mixture} = 40 \times \frac{10}{100}$$

$$= 4 \text{ litres}$$

$$\therefore \text{Milk content} = 40 - 4$$

$$= 36 \text{ litres}$$

Let x litres of water is mixed.

$$\text{Then, } \frac{4 + x}{40 + x} = \frac{20}{100}$$

$$\Rightarrow \frac{4 + x}{40 + x} = \frac{1}{5}$$

$$\Rightarrow 20 + 5x = 40 + x$$

$$\Rightarrow 4x = 20 \Rightarrow x = 5 \text{ litres}$$

12. (2) Alcohol = $\left(\frac{15}{100} \times 400\right)$ ml

$$= 60 \text{ ml.}$$

Water = 340 ml.

Let x ml of alcohol be added.

$$\text{Then, } \frac{60 + x}{400 + x} \times 100 = 32$$

$$\text{or } \frac{60 + x}{400 + x} = \frac{32}{100} = \frac{8}{25}$$

$$\text{or } 1500 + 25x = 3200 + 8x$$

$$\text{or } 17x = 1700$$

$$\text{or } x = 100 \text{ ml}$$

13. (2) Initial quantity of gold

$$= \frac{50 \times 80}{100} = 40 \text{ gm}$$

Let ' x ' gm be mixed.

$$(40 + x) = (50 + x) \times \frac{95}{100}$$

$$\Rightarrow 40 + x = (50 + x) \times \frac{19}{20}$$

$$\Rightarrow 800 + 20x = 950 + 19x$$

$$\Rightarrow x = 150 \text{ gm}$$

14. (3) In 200 litres of mixture,

$$\text{Quantity of milk} = \frac{85}{100} \times 200$$

$$= 170 \text{ litres}$$

Quantity of water = 30 litres

Let the quantity of additional milk added be x litres.

According to the question,

$$\frac{170 + x}{200 + x} \times 100 = 87.5$$

$$\Rightarrow (170 + x) \times 100$$

$$= 17500 + 87.5x$$

$$\Rightarrow 100x - 87.5x$$

$$= 17500 - 17000$$

$$\Rightarrow 12.5x = 500$$

$$\Rightarrow x = \frac{500}{12.5} = 40 \text{ litres}$$

15. (2) Let x litres of first mixture is mixed with y litres of the second mixture.

According to the question,

$$\frac{x \times \frac{30}{100} + y \times \frac{50}{100}}{x \times \frac{70}{100} + y \times \frac{50}{100}} = \frac{45}{55}$$

$$\Rightarrow \frac{0.3x + 0.5y}{0.7x + 0.5y} = \frac{9}{11}$$

$$\Rightarrow 6.3x + 4.5y = 3.3x + 5.5y$$

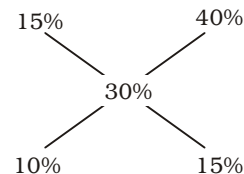
$$\Rightarrow 6.3x - 3.3x = 5.5y - 4.5y$$

$$\Rightarrow 3x = y$$

$$\Rightarrow \frac{x}{y} = 1:3$$

16. (1) Solution I

Solution II



\therefore Required ratio = 10 : 15 = 2 : 3

PERCENTAGE

17. (2) Alcohol = $15 \times \frac{1}{5} = 3$ litres

Water = $15 \times \frac{4}{5} = 12$ litres

∴ Required percentage

$$= \frac{3}{15+3} \times 100$$

$$= \frac{50}{3} = 16\frac{2}{3}\%$$

18. (2) ∴ 12 kg copper is contained in 100 kg of alloy
69 kg copper is contained in
∴ $\frac{100}{12} \times 69 = 575$ kg of alloy

19. (3)

Alcohol I $\frac{1}{4}$	Alcohol II $\frac{1}{2}$
Mean value $\frac{2}{5}$	
$\frac{1}{2} - \frac{2}{5} = \frac{5-4}{10}$ $= \frac{1}{10}$	$\frac{2}{5} - \frac{1}{4} = \frac{8-5}{20}$ $= \frac{3}{20}$

∴ Required ratio = $\frac{1}{10} : \frac{3}{20}$

= 2 : 3

20. (2) In 20 litres of mixture,

Alcohol $\Rightarrow \frac{20 \times 20}{100} = 4$ litres

Water $\Rightarrow 20 - 4 = 16$ litres

On adding 4 litres of water,

Quantity of water $\Rightarrow 16 + 4$

= 20 litres

Quantity of mixture = 24 litres

∴ Required per cent

$$= \frac{4}{24} \times 100 = \frac{50}{3} = 16\frac{2}{3}\%$$

21. (3) In 300 gm of solution,

Sugar = $\frac{300 \times 40}{100} = 120$ gm.

Let x gm of sugar be mixed.

According to the question,

$$\frac{120+x}{300+x} = \frac{1}{2}$$

$$\Rightarrow 240 + 2x = 300 + x$$

$$\Rightarrow 2x - x = 300 - 240$$

$$\Rightarrow x = 60 \text{ gm.}$$

22. (2) Quantity of sugar in the solu-

tion = $\frac{3 \times 60}{100} = 1.8$ units

On adding 1 litre of water,

∴ Required percent

$$= \frac{1.8}{4} \times 100 = 45\%$$

23. (2) In 32 litres of solution,

Alcohol = $\frac{32 \times 20}{100} = 6.4$ litres

Water = $32 - 6.4 = 25.6$ litres

On adding 8 litres of water,

Required percent = $\frac{6.4}{40} \times 100 = 16\%$

TYPE-VI

1. (3) Using Rule 8,

Tricky approach

Required percentage decrease

$$= \frac{\text{Increase}}{100 + \text{Increase}} \times 100$$

$$= \frac{20}{100+20} \times 100$$

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

2. (1) Using Rule 8,
Required answer

$$= \frac{10}{(100+10)} \times 100$$

$$= \frac{10}{110} \times 100 = \frac{100}{11}\% = 9\frac{1}{11}\%$$

3. (1) Using Rule 8,
Required reduction in consump-

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

where x = 25

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

4. (3) Using Rule 8,
Reduction in consumption

$$= \left\{ \frac{R}{100+R} \times 100 \right\} \%$$

$$= \left(\frac{20}{120} \times 100 \right) \%$$

$$= \frac{50}{3} \% = 16\frac{2}{3}\%$$

5. (2) Let the CP of each article = ₹ 100 and consumption = 100 units

Initial expenditure

$$= ₹ (100 \times 100) = ₹ 10000$$

$$\text{New price of article} = ₹ 80$$

$$\text{Consumption} = 120 \text{ units}$$

$$\text{Expenditure} = ₹ (120 \times 80)$$

$$= ₹ 9600$$

$$\text{Decrease} = ₹ (10000 - 9600)$$

$$= ₹ 400$$

∴ Percentage decrease

$$= \frac{400 \times 100}{10000} = 4\%$$

Aliter : Using Rule 3,

Required percentage decrease

$$= \frac{20^2}{100} \%$$

$$= 4\% \text{ decreases}$$

6. (2) Using Rule 8,

If the price of a commodity increases by R%, then reduction in consumption, not to increase the expenditure is given by

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

$$= \frac{15}{100+15} \times 100 = \frac{15}{115} \times 100$$

$$= \frac{300}{23} = 13\frac{1}{23}\%$$

7. (2) Using Rule 8,

Required fractional decrease

$$= \frac{R}{100+R} = \frac{50}{100+50} = \frac{1}{3}$$

8. (4) Using Rule 8,
Percentage decrease

$$= \frac{25}{125} \times 100 = 20\%$$

9. (4) Using Rule 9,

Required increase percent

$$= \frac{40}{100-40} \times 100$$

$$= \frac{40}{60} \times 100 = \frac{200}{3} = 66\frac{2}{3}\%$$



PERCENTAGE

10. (4) Using Rule 8,

Required percentage decrease

$$= \frac{20}{100 + 20} \times 100$$

$$= \frac{50}{3} = 16\frac{2}{3}\%$$

11. (2) Using Rule 2,

Percentage increase

$$= \frac{7.50 - 6}{6} \times 100 = 25\%$$

∴ Percentage decrease in con-

$$\text{sumption} = \frac{25}{125} \times 100 = 20\%$$

12. (2) Using Rule 4,

Percentage effect

$$= \left(20 - 20 + \frac{20 \times -20}{100} \right)\%$$

$$= -4\%$$

Negative sign shows decrease.

13. (2) If the reduction in consumption be $x\%$, then

$$60 - x - \frac{60x}{100} = 0$$

$$\Rightarrow 60 - x - \frac{3x}{5} = 0$$

$$\Rightarrow 300 - 5x - 3x = 0$$

$$\Rightarrow 8x = 300$$

$$\Rightarrow x = \frac{300}{8} = 37.5\%$$

Aliter : Using Rule 8,

Required percentage

$$= \frac{60}{160} \times 100\%$$

$$= \frac{300}{8} = \frac{75}{2} = 37.5\%$$

14. (4) Using Rule 8,

Required per cent

$$= \frac{25 \times 100}{125} = 20\%$$

15. (2) Using Rule 8,

Percentage decrease in the consumption of petrol

$$= \left(\frac{20}{100 + 20} \times 100 \right)\%$$

$$= \frac{50}{3} = 16\frac{2}{3}\%$$

TYPE-VII

1. (3) Total candidates

$$= 1000 + 800 = 1800$$

The candidates who are passed

$$= 1000 \times \frac{60}{100} + 800 \times \frac{50}{100}$$

$$= 600 + 400 = 1000$$

The number of candidates who failed = $1800 - 1000 = 800$

∴ Required percent

$$= \frac{800}{1800} \times 100 = 44.4\%$$

Aliter : Using Rule 25,

Percentage of passed students

$$= \left(\frac{B \cdot b + G \cdot g}{B + G} \right)\%$$

$$= \frac{1000 \times 60 + 800 \times 50}{1000 + 800}$$

$$= \frac{60000 + 40000}{1800}$$

$$= \frac{100000}{1800}$$

$$= \frac{500}{9} = 55.5$$

∴ Percentage of failed students

$$= 100 - 55.5 = 44.4\%$$

2. (3) Let the maximum marks be x .

According to question,
20% of $x + 5 = 30\%$ of $x - 20$

$$\Rightarrow (30 - 20)\% \text{ of } x = 25$$

$$\Rightarrow x = \frac{25 \times 100}{10} = 250$$

∴ Passing marks

$$= 20\% \text{ of } 250 + 5 = 55$$

∴ % Passing marks

$$= \frac{55}{250} \times 100 = 22\%$$

Aliter : Using Rule 22,

Here, $m = 30\%$, $n = 20\%$, $p = 5$ and $q = 20$

∴ Maximum marks

$$= \frac{100}{(n - m)} \times (p + q)$$

$$= \frac{100}{(30 - 20)} \times (5 + 20)$$

$$= \frac{100 \times 25}{10} = 250$$

Passing marks

$$= 20\% \text{ of } 250 + 5 = 55$$

∴ % of passing marks

$$= \frac{55}{250} \times 100 = 22\%$$

3. (3) **Tricky approach**

According to question,

$$40\% \Rightarrow 220 + 20$$

$$\text{or } 40\% \Rightarrow 240$$

$$\therefore 100\% \Rightarrow \frac{240}{40} \times 100 = 600$$

Aliter : Using Rule 24,

$$a = 40\%, b = 220, c = 20$$

$$\text{Total Marks} = \frac{100(220 + 20)}{40}$$

$$= \frac{100 \times 240}{40} = 600$$

4. (3) Let the total marks be x .

According to the question,

$$25\% \text{ of } x + 40 = 33\% \text{ of } x$$

$$\Rightarrow (33 - 25)\% \text{ of } x = 40$$

$$\Rightarrow 8\% \text{ of } x = 40$$

$$\Rightarrow x = \frac{40 \times 100}{8} = 500$$

5. (1) Let the marks obtained by first student be x .

∴ Marks obtained by second student = $x + 9$

Sum of their marks

$$= 2x + 9$$

As given,

$$x + 9 = 56\% \text{ of } (2x + 9)$$

$$\Rightarrow x + 9 = \frac{56}{100} \times (2x + 9)$$

$$\Rightarrow x + 9 = \frac{14}{25} \times (2x + 9)$$

$$\Rightarrow 25x + 225 = 28x + 126$$

$$\Rightarrow 3x = 225 - 126$$

$$\Rightarrow x = \frac{99}{3} = 33$$

∴ Marks obtained are 42 and 33.

6. (1) Let marks obtained by Supriyo

$$= x$$

$$\therefore \frac{9x}{10} = 81 \Rightarrow x = \frac{81 \times 10}{9} = 90$$

7. (3) Let the maximum marks be x .

According to the question,

$$40\% \text{ of } x = 90 + 10$$

$$\Rightarrow x = \frac{100 \times 100}{40} = 250$$



PERCENTAGE

Aliter : Using Rule 24,
a = 40%, b = 90, c = 10
Maximum marks

$$= \frac{(b+c)}{a} \times 100$$

$$= \frac{(90+10)}{40} \times 100 = 250$$

8. (1) $n(M) = 65$, $n(P) = 48$, $n(M \cap P) = 30$

$$\therefore n(M \cup P) = n(M) + n(P) - n(M \cap P)$$

$$= 65 + 48 - 30 = 83$$

\therefore Per cent of students passed = 83

\therefore Per cent of students failed = 17

Method 2 :

Students passed only in Math
= $65 - 30 = 35\%$

Students passed only in Physics
= $48 - 30 = 18\%$

\therefore Total passing %

$$= 35 + 18 + 30 = 83\%$$

$$\therefore \text{Failed} = 100 - 83 = 17\%$$

9. (3) Let the number of students in the class be 100.

\therefore Number of students in Biology = 72 and number of students in Maths = 44.

\therefore Number of students opting for both subjects
= $72 + 44 - 100 = 16$

\therefore When 16 students opt for both subjects, total number of students = 100

\therefore When 40 students opt for both subjects, total number of students = $\frac{100}{16} \times 40 = 250$

10. (1) Let the maximum marks be x.

$$\therefore \frac{x \times 33}{100} = 125 + 40 = 165$$

$$\Rightarrow x = \frac{165 \times 100}{33} = 500$$

Aliter : Using Rule 24,
a = 33%, b = 125, c = 40
Maximum marks

$$= \frac{(b+c)}{a} \times 100$$

$$= \frac{(125+40)}{33} \times 100$$

$$= \frac{165 \times 100}{33} = 500$$

11. (2) Let maximum marks be x, then,

$$\frac{36 \times x}{100} = 113 + 85 = 198$$

$$\Rightarrow x = \frac{198 \times 100}{36} = 550$$

Aliter : Using Rule 24,
a = 36%, b = 113, c = 85
Maximum marks

$$= \frac{(b+c) \times 100}{a}$$

$$= \frac{(113+85) \times 100}{36}$$

$$= \frac{198 \times 100}{36} = 550$$

12. (2) 46% of 500

$$= \frac{500 \times 46}{100} = 230$$

$$32\% \text{ of } 300 = \frac{300 \times 32}{100} = 96$$

$$\text{Required marks} = 230 - 96 = 134$$

$$\text{Let } x\% \text{ of } 200 = 134$$

$$\Rightarrow \frac{200 \times x}{100} = 134$$

$$\Rightarrow 2x = 134$$

$$\Rightarrow x = \frac{134}{2} = 67\%$$

13. (2) A = 360;

$$B = \frac{360 \times 100}{90} = 400$$

$$C = \frac{400 \times 100}{125} = 320$$

$$D = \frac{320 \times 100}{80} = 400$$

\therefore Required percentage

$$= \frac{400}{500} \times 100 = 80\%$$

14. (4) Failed candidates

$$= \frac{1100 \times 50}{100} + \frac{900 \times 60}{100}$$

$$= 550 + 540 = 1090$$

\therefore Required percentage

$$= \frac{1090}{2000} \times 100 = 54.5\%$$

Aliter : Using Rule 25,
B = 1100, b = 50%, G = 900, g = 40%

Percentage of failed candidates

$$= \frac{(Bb + Gg)}{B + G} \%$$

$$= \frac{1100 \times 50 + 900 \times 40}{1100 + 900}$$

$$= \frac{55000 + 36000}{2000}$$

$$= \frac{91}{2} = 45.5\%$$

15. (2) Successful boys in English or Maths or both

$$= 80 + 85 - 75 = 90\%$$

Unsuccessful boys = 10%

\therefore Total number of boys

$$= \frac{100}{10} \times 45 = 450$$

16. (2) 25% of students pass in at least one subject i.e.; they pass in one or both subjects.

\therefore % of students who don't pass or fail in both subjects

$$= (100 - 25)\% = 75\%$$

17. (1) The percentage of students who pass in one or two or both subjects

$$= 60 + 70 - 40 = 90$$

\therefore Percentage of failed students = $100 - 90 = 10\%$

18. (3) Let total number of candidates = 100

70 candidates passed in English and 30 failed in it.

80 candidates passed in Maths and 20 failed in it.

10 candidates failed in English and Maths both.

\therefore Out of 30 failed in English, 10 failed in Maths also.

\therefore $30 - 10 = 20$ failed in English alone.

Similarly,

$20 - 10 = 10$ failed in Maths alone.

\therefore Total number of failures

$$= 20 + 10 + 10 = 40$$

\therefore $100 - 40 = 60$ candidates passed in both subjects.

Now, if 60 candidates pass, total strength = 100

\therefore For 144 candidates, total

$$\text{strength} = \frac{100}{60} \times 144 = 240$$

PERCENTAGE

19. (4) Difference of percentages of maximum marks obtained by two candidates = $32\% - 20\% = 12\%$
 Difference of scores between two candidates = $30 + 42 = 72$
 $\therefore 12\%$ of maximum marks = 72
 \therefore Maximum marks

$$= \frac{72 \times 100}{12} = 600$$

\therefore Pass marks = 20% of $600 + 30$
 $= 120 + 30 = 150$
 \therefore Required percentage

$$= \frac{150}{600} \times 100 = 25\%$$

Aliter : Using Rule 22,

$n = 32\%$, $m = 20\%$, $p = 30$, $q = 42$.

$$\text{Full Marks} = \frac{100}{n - m} \times (p + q)$$

$$= \frac{100}{(32 - 20)} \times (30 + 42)$$

$$= \frac{100}{32} \times 72 = 600$$

Pass marks = 20% of $600 + 30$
 $= 120 + 30 = 150$

\therefore Required percentage

$$= \frac{150}{600} \times 100 = 25\%$$

20. (4) Total number of students = $640 + 360 = 1000$
 Number of successful boys = 60% of $640 = 384$
 Number of successful girls = 80% of $360 = 288$
 Total number of successful students = $384 + 288 = 672$
 Number of unsuccessful students = $1000 - 672 = 328$
 \therefore Required percentage

$$= \frac{328 \times 100}{1000} = 32.8\%$$

Aliter : Using Rule 25,

$B = 640$, $G = 360$,

$b = 60\%$, $g = 80\%$

Percentage of passed students

$$= \left(\frac{Bb + Gg}{B + G} \right) \%$$

$$= \frac{640 \times 60 + 360 \times 80}{640 + 360}$$

$$= \frac{38400 + 28800}{1000}$$

$$= \frac{67200}{1000} = 67.2\%$$

\therefore % of failed students
 $= 100 - 67.2\%$
 $= 32.8\%$

21. (3) Let total number of students = 100

Number of failures in Maths = 34

Number of failures in English = 42

Number of failures in both subjects = 20

Number of failures in Maths or English or both

$$= 34 + 42 - 20 = 56$$

Number of students who passed in both subjects

$$= 100 - 56 = 44$$

The required percentage = 44%

Aliter : Using Rule 23,

$a = 34\%$, $b = 42\%$, $c = 20\%$

Passed candidates in both the subjects

$$= 100 - (a + b - c)$$

$$= 100 - (34 + 42 - 20)$$

$$= 100 - 56 = 44\%$$

22. (2) Difference of percentage

$$= (40 - 30)\% = 10\%$$

Difference of marks = $6 + 6 = 12$

$\therefore 10\%$ of total marks = 12

$$\text{Total marks} = \frac{12 \times 100}{10} = 120$$

Aliter : Using Rule 22,

Here, $m = 30\%$, $n = 40\%$,

$$p = 6$$
, $q = 6$.

\therefore Maximum Marks

$$= \frac{100}{(n - m)} \times (p + q)$$

$$= \frac{100}{(40 - 30)} \times (6 + 6)$$

$$= \frac{100}{10} \times 12 = 120$$

23. (3) Let the total number of students = 100

\therefore Number of students who failed in Hindi or English or both

$$= 52 + 42 - 17 = 77$$

\therefore Number of students who passed in both subjects

$$= 100 - 77 = 23\%$$

\therefore Required percentage = 23%

Aliter : Using Rule 23,

$a = 52\%$, $b = 42\%$, $c = 17\%$

Passed candidates

$$= 100 - (52 + 42 - 17)$$

$$= 100 - (94 - 17)$$

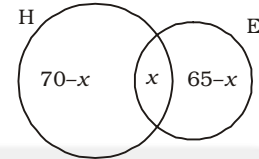
$$= 100 - 77 = 23\%$$

24. (2) Let total number of students = 100

$\therefore 27$ students speak none of the two languages.

It means only 73 students speak either Hindi or English or both.

Let x students speak both languages.



$$\therefore 73 = 70 - x + x + 65 - x$$

$$\Rightarrow x = 70 + 65 - 73 = 62\%$$

25. (2) Clearly, 75 candidates qualify

$\therefore 75\%$ of appearing candidates = 450

\therefore Number of appearing candidates

$$= \frac{450 \times 100}{75} = 600$$

26. (1) Number of students passed in first year = 75

Number of students passed in

$$\text{second year} = \frac{60 \times 75}{100} = 45$$

Total number of passed students = $75 + 45 = 120$

Total number of appeared students = 175

\therefore Required percentage

$$= \frac{120}{175} \times 100 = 68\frac{4}{7}\%$$

27. (4) Let the maximum marks be x .

According to the question,

$$35\% \text{ of } x = 200 + 10$$

$$\Rightarrow \frac{35x}{100} = 210$$

$$\Rightarrow x = \frac{210 \times 100}{35} = 600$$

Aliter : Using Rule 24,

$a = 35\%$, $b = 200$, $c = 10$

Maximum Marks

$$= \frac{100 \times (b + c)}{a}$$

$$= \frac{100(200 + 10)}{35}$$

$$= 600 \text{ Marks}$$

PERCENTAGE

- 28.** (1) Let the full marks in that examination were x .

According to the question,

$$\frac{30x}{100} + 5 = \frac{40x}{100} - 10$$

$$\Rightarrow \frac{4x}{10} - \frac{3x}{10} = 10 + 5$$

$$\Rightarrow \frac{x}{10} = 15$$

$$\therefore x = 150$$

\therefore Minimum pass marks

$$\frac{30}{100} \times 150 + 5 = 50$$

Aliter : Using Rule 22,

$m = 30\%$, $n = 40\%$,

$p = 5$, $q = 10$.

Maximum marks

$$= \frac{100}{(n - m)} \times (p + q)$$

$$= \frac{100}{(40 - 30)} \times (5 + 10) = 150$$

\therefore Minimum passing marks

$$= 150 \times \frac{30}{100} + 5$$

$$= 45 + 5 = 50$$

- 29.** (4) Let the total number of candidates = x

\therefore Number of candidates passed in English = $0.6x$

Number of candidates passed in Maths = $0.7x$

Number of candidates failed in both subjects = $0.2x$

Number of candidates passed in atleast one subject

$$= x - 0.2x = 0.8x$$

$$\therefore 0.6x + 0.7x - 2500 = 0.8x$$

$$\Rightarrow 1.3x - 0.8x = 2500$$

$$\Rightarrow 0.5x = 2500$$

$$\Rightarrow x = \frac{2500}{0.5} = 5000$$

- 30.** (3) Let the maximum marks in the examination = x .

According to the question,

$$\frac{40x}{100} - \frac{30x}{100} = 50$$

$$\Rightarrow \frac{10x}{100} = 50$$

$$\Rightarrow x = \frac{50 \times 100}{10} = 500$$

Aliter : Using Rule 22,

$m = 30\%$, $n = 40\%$, $p = 25$ and q

$= 25$

\therefore Maximum marks

$$= \frac{100}{(n - m)} \times (p + q)$$

$$= \frac{100}{(40 - 30)} \times (25 + 25)$$

$$= 500$$

- 31.** (1) Let total candidates be ' x '
Percentage of the candidates passing in English or Mathematics or both

$$= n(E) + n(M) - n(E \cap M)$$

$$= 80 + 85 - 73 = 92$$

\Rightarrow Percentage of candidates who failed in both the subjects

$$= 100 - 92 = 8 \text{ or } 8\%$$

- 32.** (1) Percentage of students who failed in Maths or English or both = $(25 + 35 - 10)\% = 50\%$

\therefore Required percentage

$$= (100 - 50)\% = 50\%$$

Aliter : Using Rule 23,

$a = 35\%$, $b = 25\%$ and $c = 10\%$

\therefore Passed candidates in both the subjects.

$$= 100 - (a + b - c)\%$$

$$= 100 - (35 + 25 - 10)\%$$

$$= 100 - 50 = 50\%$$

- 33.** (1) If the total number of students be x , then

$$7\% \text{ of } x = 259$$

$$\Rightarrow \frac{x \times 7}{100} = 259$$

$$\Rightarrow x = \frac{259 \times 100}{7} = 3700$$

- 34.** (3) If the total number of students be x , then

$$x = \frac{90x}{100} + \frac{85x}{100} - 150$$

$$\Rightarrow 100x = 90x + 85x - 15000$$

$$\Rightarrow 175x - 100x = 15000$$

$$\Rightarrow 75x = 15000$$

$$\Rightarrow x = 200$$

- 35.** (1) Required percentage

$$= \frac{40 \times 100 + 50 \times 90 + 60 \times 80}{40 + 50 + 60}$$

$$= 88 \frac{2}{3} \%$$

- 36.** (2) If D gets 100 marks, then

Marks obtained by C = 125

Marks obtained by B

$$= \frac{125 \times 90}{100}$$

Marks obtained by A

$$= \frac{125 \times 90}{100} \times \frac{125}{100}$$

$$\therefore 100 = \frac{125 \times 125 \times 90}{10000}$$

$$\therefore 320 = \frac{125 \times 125 \times 90 \times 320}{1000000}$$

$$= 450$$

- 37.** (2) Total examinees

$$= 80 + 60 = 140$$

Total successful examinees

$$= \frac{80 \times 60}{100} + \frac{60 \times 80}{100}$$

$$= 48 + 48 = 96.$$

\therefore Required percent

$$= \frac{96}{140} \times 100 = \frac{480}{7} = 68 \frac{4}{7} \%$$

Aliter : Using Rule 25,

Let us take B = 80, G = 60 and b

= 60%, g = 80%

\therefore Percentage of passed candidates

$$= \left(\frac{Bb + Gg}{B + G} \right) \%$$

$$= \left(\frac{80 \times 60 + 60 \times 80}{80 + 60} \right) \%$$

$$= \frac{9600}{140}$$

$$= \frac{480}{7} = 68 \frac{4}{7} \%$$

- 38.** (4) $n(A \cup B)$

$$= n(A) + n(B) - n(A \cap B)$$

$$= 19 + 10 - 7 = 22\%$$

i.e. 22% of students are unsuccessful in either one or two subjects.

\therefore Percentage of successful students = $100 - 22 = 78\%$

Aliter : Using Rule 24,

$a = 19\%$, $b = 10\%$, $c = 7\%$

Passed students in both the subjects

$$= 100 - (a + b - c)$$

$$= 100 - (19 + 10 - 7)$$

$$= 100 - 22 = 78\%$$

- 39.** (2) Successful students in both classes

$$= \frac{20 \times 80}{100} + \frac{30 \times 60}{100}$$

$$= 16 + 18 = 34$$



PERCENTAGE

∴ Required percentage

$$= \frac{34}{50} \times 100 = 68\%$$

OR

Required percentage

$$= \frac{20 \times 80 + 30 \times 60}{50}$$

$$= \frac{1600 + 1800}{50} = \frac{3400}{50}$$

$$= 68\%$$

Aliter : Using Rule 25,

Let us take B = 20, G = 30, b = 80%, g = 60%

∴ Required percentage

$$= \frac{Bb + Gg}{B + G}$$

$$= \left(\frac{20 \times 80 + 30 \times 60}{20 + 30} \right) \%$$

$$= \left(\frac{1600 + 1800}{50} \right) \%$$

$$= \frac{3400}{50} \% = 68\%$$

40. (4) Failures in English

$$= 100 - 75 = 25$$

$$\text{Failures in Maths} = 100 - 60 = 40$$

$$\text{Failures in both subjects} = 25$$

$$\text{Failures in English only}$$

$$= 25 - 25 = 0$$

$$\text{Failures in Maths only}$$

$$= 40 - 25 = 15$$

$$\text{Failures in one or both subjects}$$

$$= 25 + 15 = 40$$

$$\text{Percentage of successfuls}$$

$$= 100 - 40 = 60$$

$$\text{Let total students be } x.$$

$$\therefore x \times \frac{60}{100} = 240$$

$$\Rightarrow x = \frac{240 \times 100}{60} = 400$$

41. (4) Maximum marks in the examination = x (let)

$$\therefore \frac{40x}{100} - \frac{30x}{100} = 12 + 28$$

$$\Rightarrow \frac{10x}{100} = 40 \Rightarrow x = 40 \times 10$$

$$= 400$$

Aliter : Using Rule 22,

Here, m = 30%, n = 40%, p = 12, q = 28

∴ Maximum marks

$$= \frac{100}{(n - m)} \times (p + q)$$

$$= \frac{100}{(40 - 30)} \times (12 + 28)$$

$$= \frac{100 \times 40}{10} = 400$$

42. (4) Total marks scored in all three subjects

$$= \frac{300 \times 70}{100} = 210$$

∴ Marks scored in third subject

$$= 210 - 60 - 80 = 70$$

43. (4) Let total marks in the exam be x.

According to the question,

$$\frac{x \times 36}{100} = 190 + 35 = 225$$

$$\Rightarrow x \times 36 = 225 \times 100$$

$$\Rightarrow x = \frac{225 \times 100}{36} = 625$$

Aliter : Using Rule 24,

a = 36%, b = 190, c = 35

$$\text{Total marks} = \frac{(b + c) \times 100}{a}$$

$$= \frac{(190 + 35) \times 100}{36}$$

$$= \frac{225 \times 100}{36}$$

$$= \frac{25 \times 100}{4} = 625$$

44. (3) Let the full marks of exam be x.

According to the question,

$$\frac{x \times 32}{100} - \frac{x \times 20}{100} = 30 + 42$$

$$\Rightarrow \frac{12x}{100} = 72$$

$$\Rightarrow x = \frac{72 \times 100}{12} = 600$$

∴ Minimum marks to pass

$$= \frac{600 \times 20}{100} + 30$$

$$= 120 + 30 = 150$$

∴ Required percentage

$$= \frac{150}{600} \times 100 = 25\%$$

Aliter : Using Rule 22,

Here, m = 20%, n = 32%, p = 30 and q = 42

$$\text{Full Marks} = \frac{100}{(n - m)} \times (p + q)$$

$$= \frac{100}{(32 - 20)} \times (30 + 42)$$

$$= \frac{100 \times 72}{12} = 600$$

∴ Passing Marks

$$= 20\% \text{ of } 600 + 30$$

$$= \frac{20 \times 600}{100} + 30$$

$$= 120 + 30 = 150$$

$$\therefore \text{Pass percentage} = \frac{150}{600} \times 100$$

$$= 25\%$$

45. (3) Percentage of students who pass in one or two or both subjects = 73 + 70 - 64 = 79%

∴ Unsuccessful students

$$\Rightarrow 100 - 79 = 21\%$$

If the total number of examinees be x, then

$$21\% \text{ of } x = 6300$$

$$\Rightarrow x \times \frac{21}{100} = 6300$$

$$\Rightarrow x = \frac{6300 \times 100}{21} = 30000$$

46. (2) Let the number of students with less than 75% attendance = y

Total students in school = x

According to the question,

$$\frac{x}{10} + \frac{y}{5} = y$$

$$\Rightarrow \frac{x}{10} = y - \frac{y}{5} = \frac{4y}{5}$$

$$\Rightarrow \frac{x}{2} = 4y \Rightarrow \frac{y}{x} = \frac{1}{8}$$

$$\Rightarrow \frac{y}{x} \times 100 = \frac{100}{8} = 12.5\%$$

PERCENTAGE

47. (1) Number of students who wear spectacles

$$= \frac{1400 \times 25}{100} = 350$$

∴ Girls who wear spectacles

$$= \left(1 - \frac{2}{7}\right) \text{ of } 350$$

$$= 350 \times \frac{5}{7} = 250$$

48. (2) Percentage of boys = 60%

∴ Percentage of girls = 40%

Boys : Girls = 60 : 40 = 3 : 2

Number of girls = 812

∴ Number of boys

$$= \frac{3}{2} \times 812 = 1218$$

49. (1) Marks scored by A :

$$\text{First subject} \Rightarrow \frac{900 \times 72}{100} = 648$$

$$\text{Second subject} \Rightarrow \frac{700 \times 80}{100}$$

= 560

Total marks scored = 648 + 560 = 1208

Total maximum marks

= 900 + 700 = 1600

∴ Required per cent

$$= \frac{1208}{1600} \times 100 = 75.5\%$$

50. (4) Percentage of failures either in 1 subject or both subjects

= (35 + 45 - 20)% = 60%

∴ Percentage of the successful

= (100 - 60)% = 40%

51. (3) Total marks of 50 students = 50 × 70 = 3500

Total marks of 25 students

= 25 × 60 = 1500

Total marks of 24 students

= 24 × 80 = 1920

∴ Marks obtained by last student

= 3500 - 1500 - 1920

= 80 i.e., 80%

52. (3) Let marks obtained by the first student be x.

∴ Marks obtained by the second student = x - 9

According to the question, x = 56% of (x + x - 9)

$$\Rightarrow x = \frac{(2x - 9) \times 56}{100}$$

$$\Rightarrow 100x = 112x - 504$$

$$\Rightarrow 112x - 100x = 504$$

$$\Rightarrow 12x = 504$$

$$\Rightarrow x = \frac{504}{12} = 42$$

∴ Marks obtained by the second student = 42 - 9 = 33

53. (3) Maximum marks of examination = x (let)

According to the question,

25% of x = 47 + 43

$$\Rightarrow \frac{x \times 25}{100} = 90$$

$$\Rightarrow \frac{x}{4} = 90 \Rightarrow x = 4 \times 90 = 360$$

TYPE-VIII

1. (1) Using Rule 4,
Change in his salary

$$= \left(20 - 20 - \frac{20 \times 20}{100}\right)\%$$

$$= \left(-\frac{400}{100}\right)\% = -4\%$$

i.e., 4% decrease

Note : If A is first increased by x% and then decreased by y% the net % change

$$= \left(x - y - \frac{xy}{100}\right)\%$$

If the result is positive, the change indicates increase and if the result is negative, the change indicates decrease.

2. (3) Using Rule 4,
Net % change

$$= \left(A + B + \frac{AB}{100}\right)\%$$

Here, A = 20%, B = -10%

∴ Net % change

$$= 20 - 10 - \frac{200}{100}$$

$$= 10 - 20 = -10\%$$

+ve sign shows increase

3. (3) Using Rule 3,

Tricky approach

Required change

$$= \frac{(10)^2}{100}\% \text{ decrease}$$

= 1% decrease

4. (2) Using Rule 6,

A single equivalent reduction to reduction series of x%, y%

$$= \left(x + y - \frac{xy}{100}\right)\%$$

$$= \left(10 + 10 - \frac{10 \times 10}{100}\right)\%$$

$$= (20 - 1)\% = 19\%$$

5. (1) The net change in price

$$= \left(-25 + 20 - \frac{25 \times 20}{100}\right)\%$$

$$= (-25 + 20 - 5)\% = -10\%$$

Negative sign shows decrease.

6. (2) Let the price of the article be ₹ 100 and the daily sale be 100 units.

∴ Revenue day = 100 × 100

= ₹ 10000

New receipts = 75 × 130

= ₹ 9750

Decrease = ₹ (10000 - 9750)

= ₹ 250

∴ % decrease

$$= \frac{250}{10000} \times 100 = 2\frac{1}{2}\%$$

Aliter : Using Rule 5,

Required change

$$= \left(a - b - \frac{ab}{100}\right)\%$$

$$= \left(30 - 25 - \frac{30 \times 25}{100}\right)\%$$

$$= \left(5 - \frac{15}{2}\right) = -2.5\%$$

$$= 2\frac{1}{2}\% \text{ decrease.}$$

7. (3) Using Rule 7,

Tricky approach

Single equivalent percentage increase in price

$$= \left(10 + 10 + \frac{10 \times 10}{100}\right)\% = 21\%$$

8. (4) Using Rule 7,

Tricky Approach

Effective increase percentage

$$= \left(10 + 20 + \frac{20 \times 10}{100}\right)\% = 32\%$$

$$\therefore x \times \frac{132}{100} = 33$$

$$\Rightarrow x = \frac{33 \times 100}{132} = ₹ 25$$



PERCENTAGE

9. (2) Using Rule 7,

Effective percentage increase

$$= \left(20 + 20 + \frac{20 \times 20}{100} \right) \% = 44\%$$

10. (4) Using Rule 4,

Net change

$$= \left(10 - 10 - \frac{10 \times 10}{100} \right) \%$$

$$= -1\% = 1\% \text{ decrease}$$

11. (3) Using Rule 7,

Required percentage increase

$$= \left(10 + 20 + \frac{10 \times 20}{100} \right) \% = 32\%$$

12. (1) Using Rule 5,

Required effect

$$= \left(80 - 20 - \frac{80 \times 20}{100} \right) \%$$

$$= (60 - 16)\% = 44\%$$

Positive sign shows increase.

13. (3) Using Rule 7,

Net effect

$$= \left(x + y + \frac{xy}{100} \right) \%$$

$$= \left(10 - 10 - \frac{10 \times 10}{100} \right) \% = -1\%$$

Negative sign shows decrease.

14. (4) Using Rule 5,

Required per cent effect

$$= \left(20 - 25 - \frac{20 \times 25}{100} \right) \%$$

$$= (-5 - 5)\% = -10\%$$

Negative sign shows decrease

15. (2) Using Rule 7,

Percentage effect

$$= \left(10 + 10 + \frac{10 \times 10}{100} \right) \% = 21\%$$

$$\therefore \text{Increase} = ₹ 21$$

16. (2) Original fraction = $\frac{x}{y}$

$$\therefore \frac{\frac{120}{100}x}{y \times \frac{80}{100}} = \frac{4}{5}$$

$$\Rightarrow \frac{120x}{80y} = \frac{4}{5} \Rightarrow \frac{6x}{4y} = \frac{4}{5}$$

$$\Rightarrow \frac{x}{y} = \frac{4}{5} \times \frac{4}{6} = \frac{8}{15}$$

17. (3) Let original fraction be $\frac{x}{y}$

According to the question,

$$\frac{\frac{120}{100}x}{\frac{95y}{100}} = \frac{5}{2} \Rightarrow \frac{120x}{95y} = \frac{5}{2}$$

$$\Rightarrow \frac{x}{y} = \frac{5}{2} \times \frac{95}{120} = \frac{95}{48}$$

18. (2) Using Rule 4,

Effective value

$$= \left(x + y + \frac{xy}{100} \right) \%$$

$$= \left(25 - 25 - \frac{25 \times 25}{100} \right) \%$$

$$[\text{Here, } x = 25, y = -25]$$

$$= -6.25\% = 6\frac{1}{4}\% \text{ decreased}$$

(Negative value shows decrease).

19. (3) Larger number = x and smaller number = $520 - x$

$$\therefore \frac{96x}{100} = \frac{(520 - x)}{100} \times 112$$

$$\Rightarrow 96x = 520 \times 112 - 112x$$

$$\Rightarrow 112x + 96x = 520 \times 112$$

$$\Rightarrow 208x = 520 \times 112$$

$$\Rightarrow x = \frac{520 \times 112}{208} = 280$$

$$\therefore \text{Smaller number}$$

$$= 520 - 280 = 240$$

20. (3) If the original price of article be ₹ x , then

$$x \times \frac{80}{100} \times \frac{130}{100} = 416$$

$$\Rightarrow x = \frac{416 \times 100 \times 100}{80 \times 130} = ₹ 400$$

Aliter : Using Rule 5,

Let the number be x

The number increases by

$$\left(-20 + 30 - \frac{20 \times 30}{100} \right) \% = 4\%$$

$$\Rightarrow x + \frac{4x}{100} = 416$$

$$\frac{104x}{100} = 416$$

$$\boxed{x = 400}$$

21. (3) If the number be x , then

$$x \times \frac{245}{200} = 98$$

$$\Rightarrow x = \frac{98 \times 200}{245} = 80$$

22. (4) Let the original price be ₹100

New price after 10% decrease

$$= ₹ 90$$

In order to restore the price to its original value, it must be increased by ₹ 10

% increase

$$= \frac{10}{90} \times 100 = \frac{100}{9} = 11\frac{1}{9}\%$$

Aliter : Using Rule 9,

Required %

$$= \frac{10}{100 - 10} \times 100\%$$

$$= \frac{100}{9}\% = 11\frac{1}{9}\%$$

23. (1) Clearly, 75% of the number = 225

$$\therefore \text{Number} = \frac{225 \times 100}{75} = 300$$

$$\text{Again, } 125\% \text{ of } 300 = 375$$

Hence, the number should be increased by 25%

24. (1) Let the number be 100.

After 20% increase, number = 120

After 20% increase of 120, number

$$= 120 \times \frac{120}{100} = 144$$

$$\therefore \text{Per cent decrease}$$

$$= \frac{44}{144} \times 100$$

$$= \frac{275}{9} = 30\frac{5}{9}\%$$

Aliter : Using Rule 7 and Rule 8,

Increase %

$$= \left(20 + 20 + \frac{20 \times 20}{100} \right) \% = 44\%$$

Required %

$$= \left(\frac{44}{100 + 44} \right) \times 100\%$$

$$= \frac{4400}{144}\%$$

$$= \frac{275}{9}\% = 30\frac{5}{9}\%$$



PERCENTAGE

25. (4) Let the original number of employees be 100 and wages per head be ₹ 100.

$$\text{Total wages} = ₹ (100 \times 100) = ₹ 10000$$

$$\text{New number of employees} = 125$$

$$\text{New wages per head} = ₹ 75$$

$$\text{Total new wages}$$

$$= ₹ (125 \times 75) = ₹ 9375$$

$$\text{Decrease}$$

$$= ₹ (10000 - 9375)$$

$$= ₹ 625$$

$$\therefore \text{Percentage decrease}$$

$$= \frac{625}{10000} \times 100$$

$$= \frac{625}{100} = \frac{25}{4} \%$$

26. (2) Let original number be x .

$$\therefore \frac{90}{100}x \times \frac{110}{100} = x - 50$$

$$\Rightarrow \frac{99x}{100} = x - 50$$

$$\Rightarrow x - \frac{99x}{100} = 50$$

$$\Rightarrow \frac{x}{100} = 50$$

$$\Rightarrow x = 5000$$

Aliter : Using Rule 3,
Let the number be x

$$\text{Decrease \%} = \frac{10^2}{100} \% = 1\%$$

$$\Rightarrow x - 1\% \text{ of } x = x - 50$$

$$\frac{x}{100} = 50$$

$$\Rightarrow \boxed{x = 5000}$$

27. (3) Let the income be ₹ x and the rate of income tax be $y\%$
According to the question,

$$\frac{xy \times 1.19}{100} - \frac{xy}{100} = \left(x - \frac{xy}{100}\right) \times \frac{1}{100}$$

$$\Rightarrow 1.19xy - xy = x - \frac{xy}{100}$$

$$\Rightarrow 0.19y = 1 - \frac{y}{100}$$

$$\Rightarrow \frac{y}{100} + 0.19y = 1 \Rightarrow y \left(\frac{1+19}{100}\right) = 1$$

$$\Rightarrow y = \frac{100}{20} = 5\%$$

28. (3) Man's income = ₹ 100 (let)

$$\text{Expenditure} = ₹ 75$$

$$\text{Savings} = ₹ 25$$

$$\text{New income} = \frac{100 \times 120}{100}$$

$$= ₹ 120$$

$$\text{New expenditure} = \frac{75 \times 110}{100} =$$

$$₹ 82.5$$

$$\text{Savings} = 120 - 82.5 = ₹ 37.5$$

$$\text{Increase in savings} = 37.5 - 25 = ₹ 12.5$$

$$\therefore \text{Increase per cent}$$

$$= \frac{12.5}{25} \times 100 = 50 \%$$

29. (3) Single equivalent increase for 10% and 10%

$$= \left(10 + 10 + \frac{10 \times 10}{100}\right) \% = 21\%$$

Again, single equivalent increase for 21% and 10%

$$= \left(21 + 10 + \frac{21 \times 10}{100}\right) \%$$

$$= 31 + 2.1 = 33.1\%$$

Aliter : Using Rule 14,
Increase % in volume

$$= \left(3 \times 10 + \frac{3 \times 10^2}{100} + \frac{10^3}{(100)^2}\right) \%$$

$$= \left(30 + 3 + \frac{1}{10}\right) = 33.1\%$$

Note : Volume of cube = (Edge)³

Hence, formula $\left(x + y + \frac{xy}{100}\right) \%$
should be used twice.

30. (1) Using Rule 4,

$$\text{Increase in first year} = 10\%$$

$$\text{Decrease in 2nd year} = 10\%$$

$$\text{Effective result}$$

$$= \left(10 - 10 - \frac{10 \times 10}{100}\right) \%$$

$$= -1\%$$

$$\text{Increase in 3rd year} = 10\%$$

$$\therefore \text{Effective result}$$

$$= \left(10 - 1 - \frac{10 \times 1}{100}\right) \%$$

$$= (9 - 0.1) \% = 8.9\% \text{ (increase)}$$

31. (4) Let the number be x .

$$\therefore (20 + 25) \% \text{ of } x = 36$$

$$\Rightarrow \frac{45x}{100} = 36$$

$$\Rightarrow x = \frac{36 \times 100}{45} = 80$$

32. (3) Effective percentage

$$= \left(-20 + 20 - \frac{20 \times 20}{100}\right) = -4\%$$

If the number be x , then

$$4\% \text{ of } x = 20$$

$$\Rightarrow x \times \frac{4}{100} = 20$$

$$\Rightarrow x = \frac{20 \times 100}{4} = 500$$

Aliter : Using Rule 3,

Let the number be x

$$\text{Decrease \%} = \frac{20^2}{100} = 4\%$$

$$x - 4\% \text{ of } x = x - 20$$

$$\frac{4x}{100} = +20$$

$$x = 500$$

33. (2)

Initial value $\xrightarrow{\text{increasing value}}$

$$\frac{P \times x}{100} \rightarrow \text{increased value} \rightarrow P + \frac{Px}{100}$$

$$= P \left(\frac{100 + x}{100}\right)$$

\therefore Required answer

$$= \left(\frac{x}{100 + x} \times 100\right) \%$$

34. (4) Effective percentage decrease

$$= \left(x + y + \frac{xy}{100}\right) \%$$

$$= \left(-10 - 20 + \frac{(-10) \times (-20)}{100}\right) \%$$

$$= (-30 + 2) \% = -28\%$$

35. (1) Cost of edible oil = 100 per kg.

$$\text{Consumption} = 1 \text{ kg.}$$

Again,

$$\text{New price} = 125 \text{ per kg.}$$

$$\text{Consumption} = 0.8 \text{ kg.}$$

$$\text{Expenditure} = \text{Rs. } (125 \times 0.8)$$

$$= \text{Rs. } 100$$

OR

Percentage effect

$$= \left(x + y + \frac{xy}{100}\right) \%$$

$$= \left(25 - 20 - \frac{25 \times 20}{100}\right) \% = 0\%$$

PERCENTAGE

TYPE-IX

1. (4) Let the total number of votes be 100.

Number of uncast votes = 8

∴ Number of votes polled = 92

Number of votes obtained by the winner = 48

∴ Number of votes obtained by the loser = 92 - 48 = 44

If the difference of win be 4 votes, total voters = 100

∴ When the difference be 1100 votes, total voters

$$= \frac{100}{4} \times 1100 = 27500$$

Aliter : Using Rule 21,

Here, $x = 1100$, $A = 48$

∴ Total number of votes

$$= \frac{50 \times x}{50 - A}$$

$$= \frac{50 \times 1100}{50 - 48}$$

$$= \frac{50 \times 1100}{2}$$

$$= 25 \times 1100 = 27500$$

2. (3) Let the total number of voters enrolled be x .

Number of votes polled

$$= 75\% \text{ of } x = \frac{3x}{4}$$

Number of valid votes

$$= \frac{3x}{4} - \frac{2}{100} \times \frac{3x}{4} = \frac{3x}{4} - \frac{3x}{200}$$

$$= \frac{147x}{200}$$

$$\text{Now, } 75\% \text{ of } \frac{147x}{200} = 9261$$

$$\text{or } \frac{3}{4} \text{ of } \frac{147x}{200} = 9261$$

$$\text{or } x = \frac{9261 \times 4 \times 200}{3 \times 147} = 16800$$

3. (3) Difference of percentage of votes = 60% - 40% = 20%

∴ 20% of total votes = 14000

∴ 60% of total votes

$$= \frac{14000}{20} \times 60 = 42000$$

4. (4) Let total employees = 100

∴ Required percentage

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

$$= 16 + 36 = 52\%$$

5. (3) Let votes polled = x

$$\therefore x \times \left(\frac{60 - 40}{100} \right) = 298$$

$$\Rightarrow x \times \frac{1}{5} = 298$$

$$\Rightarrow x = 298 \times 5 = 1490$$

Aliter : Using Rule 26,
Total number of votes

$$= \frac{50 \times 298}{50 - 40} = 1490$$

6. (4) Number of valid votes

$$= 104000 \times \frac{98}{100} = 101920$$

∴ Valid votes received by the candidate

$$= \frac{101920 \times 55}{100} = 56056$$

7. (2) If the number of votes polled be x , then

$$\frac{x \times 20}{100} = 1600$$

$$\Rightarrow x = \frac{1600 \times 100}{20} = 8000$$

Aliter : Using Rule 26,
Total number of votes

$$= \frac{50 \times 1600}{50 - 60} = 8000$$

(-ve sign will be neglected)

8. (2) Vote percentage of third candidate

$$= 100 - 40 - 36 = 24\%$$

∴ Votes got by third candidate

$$= \frac{36000 \times 24}{100} = 8640$$

9. (3) Total votes polled = x

∴ (57 - 43)% of $x = 42000$

$$\Rightarrow x \times \frac{14}{100} = 42000$$

$$\Rightarrow x = \frac{42000 \times 100}{14} = 300000$$

Aliter : Using Rule 26,
Total number of votes

$$= \frac{50 \times 42000}{50 - 57}$$

$$= \frac{50 \times 42000}{-7} = 300000$$

(-ve sign will be neglected)

10. (4) Total number of votes polled = x

$$\therefore \frac{x \times 84}{100} - \frac{x \times 16}{100} = 476$$

$$\Rightarrow \frac{68x}{100} = 476$$

$$\Rightarrow x = \frac{476 \times 100}{68} = 700$$

Aliter : Using Rule 26,
Total number of votes

$$= \frac{50 \times 476}{50 - 84}$$

$$= \frac{50 \times 476}{34}$$

(-ve sign will be neglected)
= 700

11. (4) Number of valid votes = x (let)
∴ (62 - 38)% of $x = 7200$

$$\Rightarrow x \times \frac{24}{100} = 7200$$

$$\Rightarrow x = \frac{7200 \times 100}{24} = 30000$$

Aliter : Using Rule 26,
Total number of votes

$$= \frac{50 \times 7200}{(50 - 38)}$$

$$= 50 \times 600 = 30000$$

12. (2) Total number of votes polled = x (let)

According to the question,

$$\frac{x \times 62}{100} - \frac{x \times (100 - 62)}{100} = 144$$

$$\Rightarrow \frac{62x}{100} - \frac{38x}{100} = 144$$

$$\Rightarrow \frac{24x}{100} = 144$$

$$\Rightarrow 24x = 144 \times 100$$

$$\Rightarrow x = \frac{144 \times 100}{24} = 600$$

Aliter : Using Rule 26,



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Total number of votes

$$= \frac{50 \times 144}{(50 - 62)}$$

$$= \frac{50 \times 144}{12}$$

(-ve sign will be neglected)
= 600

13. (2) Total voters in the list = x

Votes got by the winner

$$= \frac{47x}{100}$$

Votes got by the loser

$$= x - \frac{x}{10} - 60 - \frac{47x}{100}$$

$$= \frac{9x}{10} - \frac{47x}{100} - 60$$

$$= \frac{90x - 47x}{100} - 60$$

$$= \frac{43x}{100} - 60$$

According to the question,

$$\frac{47x}{100} - \frac{43x}{100} + 60 = 308$$

$$\Rightarrow \frac{4x}{100} = 308 - 60 = 248$$

$$\Rightarrow x = \frac{248 \times 100}{4} = 6200$$

14. (2) Total votes polled = x

According to the question,
(60 - 40)% of $x = 298$

$$\Rightarrow x \times \frac{20}{100} = 298$$

$$\Rightarrow \frac{x}{5} = 298$$

$$\Rightarrow x = 298 \times 5 = 1490$$

TYPE-X

1. (3) Using Rule 17,
Required population after two years

$$= 180000 \left(1 + \frac{10}{100}\right)^2$$

$$= 180000 \times \frac{11}{10} \times \frac{11}{10} = 217800$$

2. (1) If the present worth of the equipment be ₹ 100, then

its price after 3 years

$$= 100 \times \left(\frac{80}{100}\right)^3 = ₹ 51.2$$

∴ Depreciation = 48.8%

Aliter : Using Rule 18,

Let the price of equipment be ₹ 100

Its price after 3 years.

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

$$= 100 \times \left(\frac{80}{100}\right)^3 = ₹ 51.2$$

Depreciation = 48.8%

3. (3) Using Rule 17,

$$P = P_0 \left(1 + \frac{R}{100}\right)^T$$

$$= 64000 \left(1 + \frac{5}{200}\right)^3$$

$$= 64000 \left(\frac{41}{40}\right)^3$$

$$= \frac{64000 \times 41 \times 41 \times 41}{40 \times 40 \times 40}$$

$$= 68921$$

4. (1) Using Rule 18,
Suppose the value of property two years ago was ₹ x
According to question

$$\therefore x \left(1 - \frac{10}{100}\right)^2 = 8100$$

$$\Rightarrow x \left(\frac{90}{100}\right)^2 = 8100$$

$$\Rightarrow x = \frac{8100 \times 10 \times 10}{9 \times 9}$$

$$= ₹ 10000$$

5. (1) Using Rule 18,
Let the present population be P .

$$\therefore P = 62500 \left(1 - \frac{4}{100}\right)^2$$

$$= 62500 \times \frac{24}{25} \times \frac{24}{25} = 57600$$

6. (3) Using Rule 17,
Required population

$$= 50000 \left(1 + \frac{4}{100}\right)^2$$

$$= 50000 \times \frac{26}{25} \times \frac{26}{25} = 54080$$

7. (2) Using Rule 17,

Let the man's annual salary in 2006 be ₹ x .

$$\therefore \frac{110x}{100} = 880000$$

$$\Rightarrow x = \frac{880000 \times 100}{110} = ₹ 800000$$

8. (1) Using Rule 17,

Population of the village two years ago

$$= \frac{P}{\left(1 + \frac{R}{100}\right)^2} = \frac{67600}{\left(1 + \frac{4}{100}\right)^2}$$

$$= \frac{67600 \times 25 \times 25}{26 \times 26} = 62500$$

9. (1) Using Rule 18,

$$A = P \left(1 - \frac{R}{100}\right)^T$$

$$= 200000 \left(1 - \frac{5}{100}\right)^2$$

$$= 200000 \times \frac{19}{20} \times \frac{19}{20}$$

$$= ₹ 180500$$

10. (4) Using Rule 18,
Value of the property 3 years ago

$$= \frac{P}{\left(1 - \frac{R}{100}\right)^T} = \frac{411540}{\left(1 - \frac{5}{100}\right)^3}$$

$$= \frac{411540 \times 20 \times 20 \times 20}{19 \times 19 \times 19}$$

$$= ₹ 480000$$

11. (2) Using Rule 17,
Population of town

$$= P \left(1 + \frac{R}{100}\right)^T$$

$$= 64000 \left(1 + \frac{10}{100}\right)^3$$

$$= 64000 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10}$$

$$= 85184$$



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12. (2) Using Rule 17,
Present population

$$= 10000 \left(1 - \frac{20}{100}\right)^2$$

$$= 10000 \times \frac{4}{5} \times \frac{4}{5} = 6400$$

13. (2) Required percent

$$= \frac{1}{4} \times 3 + \frac{2}{3} \times 5 + \left(1 - \frac{1}{4} - \frac{2}{3}\right) \times 11$$

$$= \frac{3}{4} + \frac{10}{3} + \frac{11}{12} = \frac{9+40+11}{12} = 5\%$$

14. (3) Using Rule 28,
Required price of the machine

$$= 6250 \left(1 - \frac{10}{100}\right) \left(1 - \frac{20}{100}\right) \left(1 - \frac{30}{100}\right)$$

$$= 6250 \times \frac{90}{100} \times \frac{80}{100} \times \frac{70}{100}$$

$$= ₹ 3150$$

15. (4) Using Rule 18,
Required value

$$= 50000 \left(1 - \frac{10}{100}\right)^2$$

$$= 50000 \times \frac{9 \times 9}{100} = ₹ 40500$$

16. (1) Using Rule 18,
If the price of machine 3 years ago be ₹ x. then

$$729 = x \left(1 - \frac{10}{100}\right)^3$$

$$\Rightarrow 729 = x \times \left(\frac{9}{10}\right)^3$$

$$\Rightarrow x = ₹ 1000$$

17. (1) Using Rule 17,
Required Raman's salary

$$= \frac{100}{100 + 5} \times 1806$$

$$= \frac{100}{105} \times 1806 = ₹ 1720$$

18. (1) By Alligation Rule

Men	Women
10%	8%
$\swarrow \quad \searrow$ 9% $\swarrow \quad \searrow$	
1%	1%

$$\therefore \text{Men : Women} = 1 : 1$$

$$\therefore \text{Number of men}$$

$$= \frac{1}{2} \times 8000 = 4000$$

19. (3) Let the number of males = x
 \therefore Number of females = 9800 - x
According to the question,

$$x \times \frac{108}{100} + (9800 - x) \times \frac{105}{100} = 10458$$

$$\Rightarrow 108x + 9800 \times 105 - 105x = 1045800$$

$$\Rightarrow 3x + 1029000 = 1045800$$

$$\Rightarrow 3x = 1045800 - 1029000$$

$$= 16800$$

$$\Rightarrow x = \frac{16800}{3} = 5600$$

20. (1) Using Rule 17,
Population in the beginning of the year

$$= \frac{\text{Population after 3 years}}{\left(1 + \frac{\text{Rate}}{100}\right)^{\text{Time}}}$$

$$= \frac{10000}{\left(1 + \frac{25}{100}\right)^3} = \frac{10000}{\left(\frac{5}{4}\right)^3}$$

$$= \frac{10000 \times 64}{125} = 5120$$

21. (4) If the number of men be 100, then

$$\text{Number of women} = 90$$

$$\therefore \text{Required per cent}$$

$$= \frac{100}{90} \times 100 \approx 111\%$$

22. (1) Using Rule 17,
Required population

$$= P \left(1 + \frac{R}{100}\right)^T$$

$$= 500000 \left(1 + \frac{4}{100}\right)^3$$

$$= 500000 \times \left(1 + \frac{1}{25}\right)^3$$

$$= 500000 \times \frac{26}{25} \times \frac{26}{25} \times \frac{26}{25}$$

$$= 562432$$

23. (2) Using Rule 17,
If the population of village two years ago be P_0 , then

$$P = P_0 \left(1 + \frac{R}{100}\right)^T$$

$$\Rightarrow 4410 = P_0 \left(1 + \frac{5}{100}\right)^2$$

$$\Rightarrow 4410 = P_0 \left(1 + \frac{1}{20}\right)^2$$

$$\Rightarrow 4410 = P_0 \left(\frac{21}{20}\right)^2$$

$$\Rightarrow 4410 = \frac{441P_0}{400}$$

$$\Rightarrow P_0 = \frac{4410 \times 400}{441} = 4000$$

24. (1) Value of TV after one year
= 21000 \times (100 - 5)%

$$= \frac{21000 \times 95}{100} = \text{Rs. } 19950$$

25. (3) Using Rule 7,
Single equivalent increase for 20% and 20%

$$= \left(20 + 20 + \frac{20 \times 20}{100}\right) \%$$

$$= 44\%$$

$$\text{Single equivalent increase for } 44\% \text{ and } 20\%$$

$$= \left(44 + 20 + \frac{44 \times 20}{100}\right) \%$$

$$= (64 + 8.8) \% = 72.8\%$$

26. (2) Population of town = 1000

$$\text{Males} \Rightarrow 600$$

$$\text{Females} \Rightarrow 400$$

$$\text{Literate males}$$

$$\Rightarrow \frac{600 \times 20}{100} = 120$$

$$\text{Total literate inhabitants}$$

$$= \frac{1000 \times 25}{100} = 250$$

$$\therefore \text{Literate females}$$

$$= 250 - 120 = 130$$

$$\therefore \text{Required percent}$$

$$= \frac{130}{400} \times 100 = 32.5\%$$



PERCENTAGE

27. (4) Using Rule 17,
If the rate of increase per annum be R%, then

$$A = P \left(1 + \frac{R}{100} \right)^T$$

$$\Rightarrow 48400 = 40000 \left(1 + \frac{R}{100} \right)^2$$

$$\Rightarrow \frac{484}{400} = \left(1 + \frac{R}{100} \right)^2$$

$$\Rightarrow \frac{121}{100} = \left(\frac{11}{10} \right)^2 = \left(1 + \frac{R}{100} \right)^2$$

$$\Rightarrow 1 + \frac{R}{100} = \frac{11}{10}$$

$$\Rightarrow \frac{R}{100} = \frac{11}{10} - 1 = \frac{1}{10}$$

$$\Rightarrow R = \frac{100}{10} = 10\% \text{ per annum}$$

28. (3) Using Rule 18,

$$A = P \left(1 - \frac{R}{100} \right)^3$$

$$\Rightarrow 7290 = P \left(1 - \frac{10}{100} \right)^3 = P \left(\frac{9}{10} \right)^3$$

$$\Rightarrow 7290 = P \times \frac{9}{10} \times \frac{9}{10} \times \frac{9}{10}$$

$$\Rightarrow P = \frac{7290 \times 10 \times 10 \times 10}{9 \times 9 \times 9}$$

$$= \text{Rs. } 10000$$

29. (1) Using Rule 17,

$$P = P_0 \left(1 + \frac{R}{100} \right)^T$$

$$\Rightarrow 9261 = P_0 \left(1 + \frac{5}{100} \right)^3$$

$$\Rightarrow 9261 = P_0 \left(1 + \frac{1}{20} \right)^3$$

$$\Rightarrow 9261 = P_0 \left(\frac{21}{20} \right)^3$$

$$\Rightarrow P_0 = \frac{9261 \times 20 \times 20 \times 20}{21 \times 21 \times 21}$$

$$= 8000$$

30. (2) Using Rule 28,
Original population of village = x
(let)

According to the question,

$$x \times \frac{95}{100} \times \frac{80}{100} = 4655$$

$$\Rightarrow x = \frac{4655 \times 100 \times 100}{95 \times 80}$$

$$= 6125$$

31. (1) In the village,

Females = 3000

Males = 9000 - 3000 = 6000

After respective increases,

Population of village

$$= 3000 \times \frac{105}{100} + \frac{6000 \times 107.5}{100}$$

$$= 3150 + 6450 = 9600$$

32. (2) Let the population of the city be 100.

Total illiterate people = 40

Poor people = 60

Rich people = 40

Illiterate rich people

$$= \frac{40 \times 10}{100} = 4$$

\therefore Illiterate poor people

$$= 40 - 4 = 36$$

\therefore Required per cent

$$= \frac{36}{60} \times 100 = 60\%$$

33. (3) Population of city after two years

$$= P \left(1 + \frac{R_1}{100} \right) \left(1 + \frac{R_2}{100} \right)$$

$$= 20000 \left(1 + \frac{20}{100} \right) \left(1 + \frac{30}{100} \right)$$

$$= 20000 \times \frac{120}{100} \times \frac{130}{100} = 31200$$

34. (1) Let the total population of village be x.

According to the question,

$$\frac{x \times 14}{100} = 574$$

$$\Rightarrow x = \frac{574 \times 100}{14} = 4100$$

TYPE-XI

1. (3) 10 per cent of ₹ 837

$$= \frac{10}{100} \times 837 = ₹ 83.7$$

\therefore Reduced per kg price

$$= \frac{83.7}{6.2} = ₹ 13.50$$

Aliter : Using Rule 31,
Reduced price per kg

$$= \frac{10 \times 837}{100 \times 6.2} = ₹ 13.50$$

2. (2) Let the original price of sugar = ₹ x /kg.

Reduced price of sugar

= 80% of x

$$= \frac{x \times 80}{100} = ₹ \frac{4x}{5} \text{ kg}$$

$$\therefore \frac{36}{4x} - \frac{36}{x} = \frac{1}{2}$$

$$\Rightarrow \frac{45}{x} - \frac{36}{x} = \frac{1}{2}$$

$$\Rightarrow \frac{9}{x} = \frac{1}{2}$$

$$\Rightarrow x = 9 \times 2 = ₹ 18/\text{Kg}$$

Aliter : Using Rule 31,

$$\text{New price} = \frac{20 \times 36}{100 \times \frac{500}{100}} = ₹ 14.4$$

Let the original price be Rs x

A.T.Q.

$$x - \frac{20x}{100} = 14.4$$

$$\frac{80x}{100} = 14.4$$

$$x = \frac{144}{8} \times 18$$

\therefore Original price = ₹ 18

3. (4) Reduced price of 6.2kg of sugar

= 10% of ₹ 1116

$$= ₹ 111.6$$

\therefore Reduced price per kg

$$= ₹ \left(\frac{111.6}{6.2} \right) = ₹ 18$$



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Aliter : Using Rule 31,

$$\begin{aligned}\text{New price} &= \frac{10 \times 1116}{100 \times 6.2} \\ &= \frac{1116}{62} = ₹ 18\end{aligned}$$

4. (2) Let the original price of sugar be ₹ x/kg.

$$\therefore \text{New price} = ₹ \frac{9x}{10} / \text{kg}$$

$$\therefore \frac{270}{\frac{9x}{10}} - \frac{270}{x} = 1$$

$$\Rightarrow \frac{300}{x} - \frac{270}{x} = 1 \Rightarrow \frac{30}{x} = 1$$

$$\Rightarrow x = ₹ 30 / \text{kg}$$

Aliter : Using Rule 31,

$$\text{New price} = \frac{10 \times 270}{100 \times 1} = ₹ 27$$

Let the original price be Rs. x

$$\Rightarrow x - \frac{10x}{100} = 27$$

$$\frac{90x}{100} = 27$$

$$x = \frac{2700}{90}$$

$$x = 30$$

\therefore Original price = ₹ 30 per kg.

5. (2) Let the original price of apples be ₹ x/ dozen

$$\therefore \text{New price} = ₹ \frac{4x}{5} / \text{dozen}$$

$$\therefore \frac{54}{\frac{4x}{5}} - \frac{54}{x} = \frac{10}{12}$$

$$\Rightarrow 54 \left(\frac{5}{4x} - \frac{1}{x} \right) = \frac{5}{6}$$

$$\Rightarrow 54 \left(\frac{5-4}{4x} \right) = \frac{5}{6}$$

$$\Rightarrow \frac{54}{4x} = \frac{5}{6} \Rightarrow 4x = \frac{54 \times 6}{5}$$

$$\therefore \frac{4x}{5} = \frac{54 \times 6}{5 \times 5} = ₹ 12.96$$

Aliter : Using Rule 31,

$$\begin{aligned}\text{Reduced price} &= \frac{20 \times 54}{100 \times \frac{10}{12}} \\ &= \frac{1080}{1000} \times 12 \\ &= ₹ 12.96 \text{ per kg}\end{aligned}$$

6. (3) The original price of 1 egg = ₹ x

$$\text{Present price} = ₹ \frac{3}{2} x$$

$$\therefore \frac{24}{x} - \frac{24}{\frac{3x}{2}} = 4$$

$$\Rightarrow \frac{24}{x} \left(1 - \frac{2}{3} \right) = 4$$

$$\Rightarrow \frac{8}{x} = 4 \Rightarrow x = 2$$

\therefore Present price of eggs per doz-

$$\text{en} = 12 \times \frac{3}{2} \times 2 = ₹ 36$$

Aliter : Using Rule 31,

$$\begin{aligned}\text{New price} &= \frac{50 \times 24}{100 \times \frac{4}{12}} \\ &= ₹ 36\end{aligned}$$

7. (1) Original price of wheat = ₹ x /kg.

New price of wheat

$$= ₹ \frac{4x}{5} / \text{kg}$$

$$\therefore \frac{320}{\frac{4x}{5}} - \frac{320}{x} = 5$$

$$\Rightarrow 320 \left(\frac{5}{4x} - \frac{1}{x} \right) = 5$$

$$\Rightarrow 320 \left(\frac{5-4}{4x} \right) = 5$$

$$\Rightarrow \frac{320}{4x} = 5$$

$$\Rightarrow x = \frac{320}{4 \times 5} = ₹ 16$$

Aliter : Using Rule 31,

$$\begin{aligned}\text{New price} &= \frac{20 \times 320}{100 \times 5} \\ &= \frac{1280}{100} = ₹ 12.8\end{aligned}$$

Let the original price be ₹ x per kg.

$$\Rightarrow x - \frac{20x}{100} = 12.8$$

$$80x = 12.8 \times 100$$

$$x = \frac{1280}{80}$$

$$x = 16 \text{ per kg.}$$

8. (4) Original rate = ₹ x per egg

$$\text{New rate} = ₹ \frac{6x}{5} \text{ per egg}$$

$$\therefore \frac{24}{x} - \frac{24 \times 5}{6x} = 2$$

$$\Rightarrow \frac{24}{x} - \frac{20}{x} = 2$$

$$\Rightarrow \frac{4}{x} = 2 \Rightarrow x = 2$$

$$\therefore \text{New rate} = ₹ \frac{12}{5} \text{ per egg.}$$

\therefore Rate per dozen of eggs

$$= ₹ \left(\frac{12}{5} \times 12 \right) = ₹ 28.80$$

Aliter : Using Rule 31,
New price/present price

$$= \frac{20 \times 24}{100 \times \frac{2}{12}} = ₹ 28.80$$

9. (4) Let original price of rice per kg = ₹ x (let)

\therefore New price of rice per kg

$$= ₹ \frac{3x}{4}$$

$$\therefore \frac{600}{\frac{3x}{4}} - \frac{600}{x} = 10$$

$$\Rightarrow 600 \left(\frac{4}{3x} - \frac{1}{x} \right) = 10$$

$$\Rightarrow 600 \left(\frac{4-3}{3x} \right) = 10$$

$$\Rightarrow \frac{600}{3x} = 10$$

$$\Rightarrow x = \frac{600}{30} = ₹ 20$$

$$\therefore \text{New price} = \frac{3x}{4} = \frac{3 \times 20}{4} = ₹ 15/\text{kg}$$



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Method 2 :

Quicker Approach

If the price of an article is reduced by $a\%$ and buyer gets c kg more for some ₹ b , the new

$$\text{price per kg of article} = \frac{ab}{100 \times c}$$

$$= \frac{25 \times 600}{100 \times 10} = ₹ 15$$

Aliter : Using Rule 31,
Reduced price per kg

$$= \frac{25 \times 600}{100 \times 10} = ₹ 15$$

10. (1) Using Rule 1,
Percentage decrease

$$= \frac{0.25}{1.25} \times 100 = 20\%$$

11. (3) If the number be x , then

$$x - 15 = \frac{4x}{5}$$

$$\Rightarrow 5x - 75 = 4x \Rightarrow x = 75$$

$$\therefore 40\% \text{ of } 75 = \frac{75 \times 40}{100} = 30$$

12. (4) Original price of article
= ₹ x per kg.

$$\text{New price} = ₹ \frac{79x}{100} \text{ per kg}$$

$$\therefore \frac{100}{79x} - \frac{100}{x} = 3$$

$$\Rightarrow \frac{10000}{79x} - \frac{100}{x} = 3$$

$$\Rightarrow \frac{10000 - 7900}{79x} = 3$$

$$\Rightarrow \frac{2100}{79x} = 3$$

$$\Rightarrow \frac{700}{79x} = 1$$

$$\Rightarrow 79x = 700 \Rightarrow x = \frac{700}{79}$$

\therefore New price

$$= \frac{79x}{100} = \frac{79}{100} \times \frac{700}{79}$$

$$= ₹ 7 \text{ per kg}$$

Aliter : Using Rule 31,
Reduced price per kg.

$$= \frac{21 \times 100}{100 \times 3} = ₹ 7$$

13. (1) Let the original price of sugar
be Rs. x per kg.

Reduced price

$$= \text{Rs. } \frac{80x}{100} = \text{Rs. } \frac{4x}{5} \text{ per kg.}$$

According to the question,

$$\frac{160}{\frac{4x}{5}} - \frac{160}{x} = 8$$

$$\Rightarrow \frac{40 \times 5}{x} - \frac{160}{x} = 8$$

$$\Rightarrow \frac{200}{x} - \frac{160}{x} = 8$$

$$\Rightarrow \frac{40}{x} = 8$$

$$\Rightarrow 8x = 40$$

$$\Rightarrow x = \frac{40}{8} = 5 \text{ per kg.}$$

Reduced Price

$$= \frac{4x}{5} = \frac{4 \times 5}{5} = \text{Rs. } 4 \text{ per kg}$$

Aliter : Using Rule 31,
Reduced price per kg.

$$= \frac{21 \times 160}{100 \times 8} = \text{Rs. } 4$$

14. (4) Required percentage change

$$= \left(10 - 20 + \frac{10 \times (-20)}{100} \right) \%$$

= -12% Negative sign shows decrease.

Aliter : Using Rule 4,
Required percentage

$$= \left(10 - 20 - \frac{10 \times 20}{100} \right)$$

$$= (-10 - 2)$$

$$= 12\% \text{ decrease.}$$

15. (2) Required per cent

$$= \frac{x}{100 + x} \times 100$$

where $x = 60\%$

$$= \frac{60}{160} \times 100 = \frac{75}{2} = 37 \frac{1}{2} \%$$

16. (2) Let original price of sugar be
Rs. x per kg.

New price

$$= \text{Rs. } \left(\frac{120x}{100} \right) = \text{Rs. } \left(\frac{6x}{5} \right) \text{ per kg.}$$

According to the question,

$$\frac{50}{x} - \frac{50}{\frac{6x}{5}} = 2$$

$$\Rightarrow \frac{50}{x} - \frac{50 \times 5}{6x} = 2$$

$$\Rightarrow \frac{50}{x} - \frac{125}{3x} = 2$$

$$\Rightarrow \frac{150 - 125}{3x} = 2$$

$$\Rightarrow 6x = 25$$

$$\Rightarrow x = \text{Rs. } \frac{25}{6} \text{ kg.}$$

\therefore Required quantity of sugar

$$= \frac{50}{x}$$

$$= \frac{50}{\frac{25}{6}} = \frac{50 \times 6}{25} = 12 \text{ kg.}$$

17. (4) Required per cent

$$= \frac{\text{Decrease}\%}{100 - \text{Decrease}\%} \times 100$$

$$= \frac{10}{100 - 10} \times 100 = \frac{100}{9}$$

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

18. (2) Required percentage increase

$$= \frac{x}{100 - x} \times 100$$

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

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

19. (1) Original price of sugar
= Rs. x /kg. (let)

$$\text{New price} = \text{Rs. } \frac{120x}{100} \text{ per kg.}$$

$$= \text{Rs. } \frac{6x}{5} \text{ per kg.}$$

According to the question,

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$$\frac{120}{x} - \frac{120}{6x} = 4$$

$$\Rightarrow \frac{120}{x} - \frac{120 \times 5}{6x} = 4$$

$$\Rightarrow \frac{120}{x} - \frac{100}{x} = 4$$

$$\Rightarrow \frac{30}{x} - \frac{25}{x} = 1$$

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

$$\Rightarrow x = \text{Rs. 5 per kg.}$$

- 20. (3)** Original price of building = Rs. 100 (let)

∴ Its price in 2001 = Rs. 80

Its price in 2002 = Rs. 60

Required percentage decrease

$$= \left(\frac{80 - 60}{80} \right) \times 100$$

$$= \frac{200}{8} = 25\%$$

TYPE-XII

- 1. (2)** Percentage of boys = 100% - 70% = 30%
Let total no. of students be x
∴ According to question,
30% of $x = 510$

$$\therefore x = \frac{510}{30} \times 100 = 1700$$

- 2. (2)** 40% of students = 972
∴ 60% of students

$$= \frac{972}{40} \times 60 = 1458$$

- 3. (1)** Number of boys

$$= \frac{70}{30} \times 504 = 1176$$

- 4. (2)** Tricky approach

Required sum = 0.5% of 19000

$$= 19,000 \times \frac{0.5}{100}$$

$$= 19,000 \times \frac{5}{1000} = ₹ 95$$

- 5. (4)** Remaining height

$$\left(192 - \frac{125}{2} \% \text{ of } 192 \right)$$

$$= 192 - 120 = 72 \text{ m}$$

∴ Required distance (distance covered in second hour) then,

$$= \frac{25}{2} \% \text{ of } 72$$

$$= \frac{25 \times 72}{2 \times 100} = 9 \text{ m}$$

- 6. (3)** Water in 100 kg fresh fruit = 68%

Water in dry fruit = 20%

Decrease = 48%

∴ Dry fruit obtained

$$= 100 - 48 = 52 \text{ kg.}$$

- 7. (3)** The net tax rate

$$= \left(30 + 30 \times \frac{10}{100} \right) \% = 33\%$$

- 8. (4)** Let z have x

$$\therefore \text{Money with Y} = \frac{3}{2}x \text{ and}$$

$$\text{Money with X} = 3x$$

$$\therefore 3x + \frac{3x}{2} + x = 3 \times 110$$

$$\Rightarrow \frac{6x + 3x + 2x}{2} = 330$$

$$\Rightarrow 11x = 2 \times 330$$

$$\Rightarrow x = \frac{2 \times 330}{11} = 60 \therefore \text{Money with}$$

$$X = 3x = ₹ (3 \times 60) = ₹ 180$$

- 9. (1)** If a number is $x\%$ more than other, then the other number is less than the first number by

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

∴ Required answer

$$= \frac{500}{100+500} \times 100 = \frac{500}{600} \times 100$$

$$= \frac{250}{3} = 83\frac{1}{3}$$

Method 2 : Let $q = x$, $p = 6x$.

$$p - q = 6x - x = 5x$$

$$\text{In } \% = \frac{5x}{6x} \times 100 = 83\frac{1}{3} \%$$

- 10. (3)** Let $x = 10$ and $y = 10$

$$\therefore xy^2 = 10 \times 10 \times 10 = 1000 \text{ units}$$

Decreasing values of x and y by 20%,

$$\text{Expression} = xy^2 = 8 \times 8 \times 8 = 512$$

$$\text{Decrease} = 1000 - 512 = 488 \text{ units}$$

Percentage decrease

$$= \frac{488}{1000} \times 100 = 48.8\%$$

- 11. (1)** Using Rule 30,

If two numbers are respectively $x\%$ and $y\%$ more than a third number, the first as a per cent of second is

$$= \frac{100+x}{100+y} \times 100 = \frac{110}{125} \times 100$$

$$= 88\%$$

- 12. (2)** Let sum of money be x .

$$\therefore \frac{11}{2} \% \text{ of } x = 220$$

$$\Rightarrow x = \frac{220 \times 200}{11} = 4000$$

$$\therefore 3\frac{1}{2} \% \text{ of } 4000 = \frac{7}{2} \times \frac{4000}{100}$$

$$= ₹ 140$$

- 13. (1)** Let the total number of workers in the factory be x .

$$\therefore x \times \frac{60}{100} \times \frac{75}{100} = 1350$$

$$\Rightarrow x =$$

$$= \frac{1350 \times 100 \times 100}{60 \times 75} = 3000$$

- 14. (4)** Let the third number = 100.

∴ First number = 70

Second number = 63

∴ Required per cent

$$= \frac{70 - 63}{70} \times 100 = 10\%$$

- 15. (1)** Let Rani's weight be x kg.

∴ Meena's weight = $4x$ kg.

$$\text{Tara's weight} = \frac{5x}{2} \text{ kg.}$$

∴ Required percentage

$$= \frac{4x}{\frac{5x}{2}} \times 100 = 160\%$$

- 16. (2)** Number of people who have the saving habit

$$= \frac{2500 \times 60}{100} = 1500$$

∴ Number of shareholders

$$= (100 - 62)\% \text{ of } 1500$$

$$= \frac{1500 \times 38}{100} = 570$$

- 17. (3)** Using Rule 18,

Let the original price of the article be ₹ x .

According to the question,

$$5832 = x \left(1 - \frac{10}{100} \right)^3$$

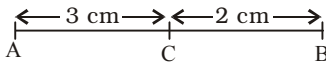
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$$\Rightarrow 5832 = x \times \left(\frac{9}{10}\right)^3$$

$$x = \frac{5832 \times 10 \times 10 \times 10}{9 \times 9 \times 9}$$

$$= ₹ 8000$$

18. (4)



Increase in AC = 6%

$$\therefore \text{Increased AC} = \frac{106}{100} \times 3$$

$$= 3.18 \text{ cm}$$

$$\therefore \text{Decreased CB} = 5 - 3.18$$

$$= 1.82 \text{ cm.}$$

$$\therefore \text{Decrease} = 2 - 1.82$$

$$= 0.18 \text{ cm}$$

$$\therefore \text{Percentage decrease}$$

$$= \frac{0.18}{2} \times 100 = 9\%$$

19. (2) $\because 24 = 100\%$

$$\therefore 22 = \frac{100}{24} \times 22 = 91\frac{2}{3}\%$$

20. (1) Let the number of boys be x and that of girls be y .

$$\text{Then, } 71x + 73y = 71.8(x + y)$$

$$\Rightarrow 71.8x - 71x = 73y - 71.8y$$

$$\Rightarrow 0.8x = 1.2y$$

$$\Rightarrow \frac{x}{y} = \frac{1.2}{0.8} = \frac{12}{8} = \frac{3}{2}$$

$$\therefore \frac{x}{y} + 1 = \frac{3}{2} + 1 \Rightarrow \frac{x + y}{y} = \frac{5}{2}$$

\therefore Percentage of girls

$$= \frac{y}{x + y} \times 100 = \frac{2}{5} \times 100 = 40\%$$

21. (2) Let the number of books in shelf B be 100.

$$\therefore \text{Number of books in shelf A} = 80$$

On transferring 25% i.e. $\frac{1}{4}$ of

books of shelf A to shelf B.

$$B = 100 + 20 = 120$$

Again, on transferring $\frac{1}{4}$ of

books of shelf B to shelf A.

$$A = 60 + \frac{120}{4} = 90$$

\therefore Required percentage

$$= \frac{90}{180} \times 100 = 50\%$$

22. (2) Total revenue earned

$$= ₹ \left(9900 \times \frac{20}{100} \times 10 + 9900 \times \frac{80}{100} \times 20 \right)$$

$$= ₹ (19800 + 158400)$$

$$= ₹ 178200$$

23. (2) Let Tina's weight = 1 kg

Lina's weight = 2 kg

Neha's weight = 1.4 kg

Mina's weight = 1.8 kg.

$$\therefore \frac{1.8x}{100} = 1.4$$

$$\Rightarrow x = \frac{1.4 \times 100}{1.8} = \frac{700}{9} = 77\frac{7}{9}$$

24. (1) Let the number of seats initially in the cinema hall be 100 and the cost of each ticket be ₹ 100.

$$\therefore \text{Total revenue} = 100 \times 100 = ₹ 10000$$

In second condition,

Number of seats = 125

Cost of each ticket = ₹ 110

\therefore New revenue

$$= 125 \times 110 = ₹ 13750$$

$$\text{Increase in revenue collection} = ₹. (13750 - 10000) = ₹ 3750$$

\therefore Percentage increase

$$= \frac{3750}{10000} \times 100 = 37.5\%$$

Aliter : % Increase in revenue

$$= \left(x + y + \frac{xy}{100} \right) \%$$

$$= \left(25 + 10 + \frac{25 \times 10}{100} \right) \% = 37.5\%$$

25. (4) Total amount = ₹ x

$$\therefore x - \frac{x}{5} - \frac{4x}{5} \times \frac{5}{100} = 120$$

$$= 1400$$

$$\Rightarrow x - \frac{x}{5} - \frac{x}{25} = 1520$$

$$\Rightarrow \frac{25x - 5x - x}{25} = 1520$$

$$\Rightarrow \frac{19x}{25} = 1520$$

$$\Rightarrow x = \frac{1520 \times 25}{19} = ₹ 2000$$

\therefore Expenditure on transport

$$= \frac{1}{25} \times 2000 = ₹ 80$$

26. (3) Let the total number of employees be x .

$$\therefore x \times \frac{69}{100} = 20700$$

$$\Rightarrow x = \frac{20700 \times 100}{69} = 30000$$

27. (4) Let the fruit seller had originally x apples.

According to the question;

$$x - 40\% \text{ of } x = 420$$

$$\Rightarrow x - \frac{40}{100} \times x = 420$$

$$\Rightarrow x - \frac{2x}{5} = 420$$

$$\Rightarrow \frac{5x - 2x}{5} = 420$$

$$\Rightarrow \frac{3x}{5} = 420$$

$$\therefore x = \frac{420 \times 5}{3} = 700$$

Method-2 :

60% = 420 (Directly)

$$\therefore 100\% = 420 \times \frac{100}{60} = 700$$

28. (3) Let third number = 100

First number = 120

Second number = 150

Required percentage

$$= \frac{120}{150} \times 100 = 80\%$$

Aliter : Using Rule 30,
Required percentage

$$= \left(\frac{100 + 20}{100 + 50} \right) \times 100\%$$

$$= \frac{120}{150} \times 100\%$$

$$= \frac{4}{5} \times 100\%$$

$$= 80\%$$

29. (2) The batsman scored $3 \times 4 + 8 \times 6 = 60$ runs by boundaries and sixes respectively. Then,

Runs scored by running

$$= 110 - 60 = 50$$

\therefore Required percentage

$$= \frac{50}{110} \times 100 = \frac{500}{11}$$

$$= 45\frac{5}{11}\%$$

30. (4) Let the initial value be A .

When it is increased by $r\%$ it becomes :

$$A + r\% \text{ of } A = \frac{A(r + 100)}{100}$$

Now, when it is decreased by $r\%$, it becomes

$$\frac{A(r + 100)}{100} - r\% \text{ of } \frac{A(r + 100)}{100}$$



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$$\begin{aligned} & \frac{A(r+100)}{100} \\ &= \frac{A(r+100)}{100} \left(1 - \frac{r}{100}\right) \\ &= \frac{A(r+100)(100-r)}{10000} \\ &\therefore A \left(\frac{10000-r^2}{10000} \right) = 1 \\ &\Rightarrow A = \frac{10000}{(10000-r^2)} \end{aligned}$$

31. (4) $y = \frac{110}{100} \times 125 = 137.5$

$\therefore x = 90\% \text{ of } y$

$$= \frac{90 \times 137.5}{100} = 123.75$$

32. (4) Error = 5.5 minutes

\therefore Error per cent

$$= \frac{5.5}{3 \times 60 + 40} \times 100 = 2.5 \text{ per cent}$$

33. (2) Per cent of families having either a cow or a buffalo or both = $60 + 30 - 15 = 75$

It means 25 per cent of families do not have a cow or a buffalo.

\therefore Required number of families

$$= 25\% \text{ of } 96 = 96 \times \frac{25}{100} = 24$$

34. (3) Let the amount invested at 6% = ₹ x

\therefore Amount invested at 5%

= ₹ $(10000 - x)$

According to the question,

$$\frac{(10000-x) \times 5}{100} - \frac{x \times 6}{100} = 76.50$$

$$\Rightarrow 50000 - 5x - 6x = 7650$$

$$\Rightarrow 50000 - 11x = 7650$$

$$\Rightarrow 11x = 50000 - 7650 = 42350$$

$$\Rightarrow x = \left(\frac{42350}{11} \right) = ₹ 3850$$

35. (1) Kites of ₹ 20 are available for ₹ 19.

Hence, discount = 5%

i.e. $\frac{1}{20} \times 100$

If one gets kites of ₹ 20 for ₹ 18, discount = 10%

\therefore Required answer

20 kites \rightarrow 2 kites

$$27 \text{ kites} \rightarrow = \frac{2}{20} \times 27 \approx 3$$

36. (3) First part = ₹ x and second part = ₹ y .

According to question,

$$\frac{x \times 80}{100} = \frac{y \times 60}{100} + 3$$

$$\Rightarrow \frac{4x}{5} = \frac{3y}{5} + 3$$

$$\Rightarrow 4x - 3y = 15 \quad \dots(i)$$

Again,

$$\frac{4y}{5} = \frac{9x}{10} + 6$$

$$\Rightarrow 8y = 9x + 60$$

$$\Rightarrow 8y - 9x = 60 \quad \dots(ii)$$

By equation (i) $\times 8 +$ (ii) $\times 3$,

$$32x - 24y = 120$$

$$24y - 27x = 180$$

$$5x = 300 \Rightarrow x = 60$$

From equation (i)

$$4 \times 60 - 3y = 15$$

$$\Rightarrow 3y = 240 - 15 = 225$$

$$\Rightarrow y = \frac{225}{3} = 75$$

$$\therefore x + y = 60 + 75 = 135$$

37. (2) Value of ₹ 100 stock = ₹ 108

\therefore Income on investing ₹ 108 = ₹

$$\frac{25}{2}$$

\therefore Income on investment of ₹ 27000

$$= ₹ \left(\frac{25}{2 \times 108} \times 27000 \right)$$

$$= ₹ 3125$$

\therefore Gain per cent

$$= \frac{3125}{27000} \times 100$$

$$= \frac{625}{54} = 11 \frac{31}{54} \%$$

38. (3) Required mass of lead

$$= 8000 \times \frac{60}{100} \times \left(1 - \frac{3}{400} \right)$$

$$= 8000 \times \frac{60}{100} \times \frac{397}{400}$$

$$= 4764 \text{ kg.}$$

39. (4) According to the question,

$$x + y = (x^2 + y^2) \times \frac{1}{5}$$

Again, $x + y = (x^2 - y^2) \times \frac{1}{4}$

$$\therefore \frac{x^2 + y^2}{5} = \frac{x^2 - y^2}{4}$$

$$\Rightarrow 5x^2 - 5y^2 = 4x^2 + 4y^2$$

$$\Rightarrow 5x^2 - 4x^2 = 5y^2 + 4y^2$$

$$\Rightarrow x^2 = 9y^2$$

$$\Rightarrow x = 3y$$

$$\therefore \frac{x+y}{x^2} = \frac{x^2+y^2}{5x^2}$$

$$= \frac{9y^2+y^2}{5 \times 9y^2} = \frac{10y^2}{45y^2} = \frac{2}{9}$$

40. (3) Let the total number of eggs bought be x .

10% of eggs are rotten.

$$\therefore \text{Remaining eggs} = \frac{90x}{100}$$

$$= \frac{9x}{10}$$

After giving 80% of eggs to the neighbour,

$$\text{Remaining eggs} = \frac{9x \times 20}{10 \times 100}$$

$$= \frac{9x}{50}$$

According to the question,

$$\frac{9x}{50} = 36 \Rightarrow 9x = 36 \times 50$$

$$\Rightarrow x = \frac{36 \times 50}{9} = 200$$

41. (4) Amount with man in the beginning = Rs. x (let).

Amount given to son and daughter = 80%.

Remaining amount

$$= 20\% \text{ of } x = \text{Rs. } \frac{x}{5}$$

Remaining amount after donations to trust

$$= \frac{x}{5} \times \frac{20}{100} = \text{Rs. } \frac{x}{25}$$

$$\therefore \frac{x}{25} = 16000$$

$$\Rightarrow x = 16000 \times 25 = \text{Rs. } 400000$$

42. (3) Let the business man's present earning be Rs. x .

According to the question,

$$x \times \frac{125}{100} \times \frac{96}{100} \times \frac{125}{100} \times \frac{96}{100} \times \frac{125}{100} = 72000$$

$$\Rightarrow x \times \frac{5}{4} \times \frac{24}{25} \times \frac{5}{4} \times \frac{24}{25} \times \frac{5}{4} = 72000$$

$$\Rightarrow x \times \frac{9}{5} = 72000$$

$$\Rightarrow x = \frac{72000 \times 5}{9} = \text{Rs. } 40000$$



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- 43.** (3) Number of blood cells in first 6 hours

$$= 40000 \left(1 + \frac{10}{100}\right)^2 \left(1 - \frac{10}{100}\right)$$

$$\left(1 + \frac{5}{100}\right)^2$$

$$= 40000 \times \frac{11}{10} \times \frac{11}{10} \times \frac{9}{10} \times$$

$$\frac{21}{20} \times \frac{21}{20} = 480249 \approx 48025$$

- 44.** (2) Let 100 pairs of shoes be bought for Rs. 100.

New budget = Rs. 160

New price = Rs. 1.20 pair of shoes

∴ Number of shoes bought

$$= \frac{160}{1.2} = \frac{1600}{12}$$

$$= \frac{400}{3} = 133\frac{1}{3}$$

∴ Percentage increase

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

- 45.** (3) Average of set A

$$= \frac{27 + 28 + 30 + 32 + 33}{5}$$

$$= \frac{150}{5} = 30$$

Case II,

$$\text{New average} = \frac{30 \times 130}{100} = 39$$

$$\therefore 150 + k = 39 \times 6 = 234$$

$$\Rightarrow k = 234 - 150 = 84$$

- 46.** (2) Initial amount with the man = Rs. x (let).

Remaining amount after first bet

$$= \text{Rs. } \frac{x}{4}$$

Remaining amount after second

$$\text{bet} = \text{Rs. } \frac{x}{16}$$

Remaining amount after third bet

$$= \text{Rs. } \frac{x}{64}$$

$$\therefore \frac{x}{16} = 2 \Rightarrow x = 2 \times 64$$

$$= \text{Rs. } 128$$

- 47.** (2) Initial number of soldiers in the army = x

According to the question,

$$x \times \frac{90}{100} \times \frac{90}{100} \times \frac{90}{100}$$

$$= 729000$$

$$\Rightarrow x = \frac{729000 \times 1000}{9 \times 9 \times 9}$$

$$= 1000000$$

- 48.** (4) Required percentage decrease = $\left(\frac{25 - 21}{25}\right) \times 100$

$$= \frac{400}{25} = 16\%$$

- 49.** (2) Required number of workers

$$= 8000 \times \frac{105}{100} \times \frac{110}{100} \times \frac{120}{100}$$

$$= 11088$$

- 50.** (4) 1% = 100 basis points

∴ 82.5% = 8250 basis points

and 62.5% = 6250 basis points

∴ Required difference

$$= 8250 - 6250$$

$$= 2000 \text{ basis points}$$

- 51.** (4) Percentage increase in sales

$$= \left(\frac{51300 - 41800}{41800}\right) \times 100$$

$$= \frac{9500}{418} = \frac{250}{11} = 22\frac{8}{11}\%$$

- 52.** (1) Defective parts of 120 machine parts

$$= \frac{120 \times 5}{100} = 6$$

Defective parts of 80 machine parts

$$= \frac{80 \times 10}{100} = 8$$

Total defective parts

$$= 6 + 8 = 14$$

∴ Required percent

$$= \frac{14}{200} \times 100 = 7\%$$

- 53.** (3) Error = (1.55 - 1.5) metre = 0.55 metre

$$\therefore \text{Error per cent} = \frac{0.05}{1.5} \times 100$$

$$= \frac{50}{15} = \frac{10}{3} = 3\frac{1}{3}\%$$

- 54.** (1) Duty payment :

$$\text{Laptop} \Rightarrow \text{Rs. } \left(\frac{210000 \times 10}{100}\right)$$

$$= \text{Rs. } 21000$$

Mobile phone

$$\Rightarrow \text{Rs. } \left(\frac{100000 \times 8}{100}\right)$$

$$= \text{Rs. } 8000$$

Television set

$$\Rightarrow \text{Rs. } \left(\frac{150000 \times 5}{100}\right)$$

$$= \text{Rs. } 7500$$

Total Duty Payment

$$= \text{Rs. } (21000 + 8000 + 7500)$$

$$= \text{Rs. } 36500$$

- 55.** (2) Initial amount with the person = Rs. x (let)

After an expense of $\frac{15}{2}\%$.

Remaining amount

$$= \left(100 - \frac{15}{2}\right)\% \text{ of } x.$$

$$= \left(\frac{200 - 15}{2}\right)\% \text{ of } x$$

$$= \text{Rs. } \frac{185x}{200} = \text{Rs. } \frac{37x}{40}$$

After an expense of 75% of it,

$$\text{Remaining amount} = \frac{37x}{40 \times 4}$$

$$= \text{Rs. } \frac{37x}{160}$$

According to the question,

$$\frac{37x}{160} = 370 \Rightarrow 37x = 370 \times 160$$

$$\Rightarrow x = \frac{370 \times 160}{37} = \text{Rs. } 1600$$

- 56.** (3) Let the number of matches played between India and Pakistan in the first case be x .

Number of wins by Pakistan

$$= \frac{60x}{100} = \frac{3x}{5}$$

According to the question,

$$\frac{3x}{x + 30} = \frac{30}{100}$$

$$\Rightarrow \frac{3x}{5(x + 30)} = \frac{3}{10}$$

$$\Rightarrow \frac{x}{x + 30} = \frac{1}{2}$$

$$\Rightarrow 2x = x + 30$$

$$\Rightarrow x = 30$$

∴ Total number of matches

$$= 30 + 30 = 60$$

□□□



TEST YOURSELF

1. The value of a car at the beginning of a year is 10% less than the value of the same car at the beginning of the previous year. If the car is valued at Rs. 1,45,800 on 1st January, 2000, what was its value on 1st January, 1997 ?
(1) Rs. 200000 (2) Rs. 250000
(3) Rs. 185000 (4) None of these
2. In an examination 42% of the candidates failed in physics, 24% of the candidates failed in Chemistry and 14% of the candidates failed in both the subjects. If 72 candidates passed in both, find the total number of candidates in the examination.
(1) 120 (2) 130
(3) 150 (4) 160
3. The number of students appeared from a school for the Madhyamik Examination in three consecutive years are in the ratio 7 : 8 : 10 and 75%, 87.5% and 93.75% of the students of respective years were successful. What is the percentage of students who were successful during these three years taken together ?
(1) 85.5% (2) 86.5%
(3) 87% (4) 88.5%
4. An alloy contains 89% of copper; find how much copper is to be mixed to a sample of alloy so as to get 44 kgs of a new metal having 90% copper in it.
(1) 2 kg (2) 3 kg
(3) 2.5 kg (4) 4 kg
5. If the numerator of a fraction is increased by 150% and the denominator of the fraction is increased by 300% the resultant fraction is $\frac{5}{18}$. What is the original fraction?
(1) $\frac{4}{9}$ (2) $\frac{8}{9}$
(3) $\frac{6}{9}$ (4) None of these
6. An alloy of gold and silver weighs 50 gms. It contains 80% gold. How much gold should be added to the alloy so that percentage of gold is increased to 90?
(1) 45 gm (2) 40 gm
(3) 50 gm (4) None of these
7. 5% of income of A is equal to 15% of income of B and 10% of income of B is equal to 20% of income of C. If income of C is ₹ 2000, then total income of A, B and C is:
(1) 26,000 (2) 16,000
(3) 18,000 (4) 20,000
8. The population of a town is 10,000. If the males increases by 5% and the females by 6%, the population will be 10,540. How many females are there?
(1) 4000 (2) 4500
(3) 4800 (4) 5400
9. A reduction of 21% in the price of wheat enables a person to buy 10.5 kg more for ₹100. What is the reduced price per kg ?
(1) ₹ 2 (2) ₹ 3
(3) ₹ 2.50 (4) ₹ 3.50
10. Mahima secured 50% marks in Hindi, 60% in English and 70% in Maths as well as in science. What were her total marks if the maximum marks obtainable in each of these 4 subjects was 50?
(1) 175 (2) 150
(3) 125 (4) None of these
11. When 50 is subtracted from 50% of a number, result is 50. The number is :
(1) 150 (2) 400
(3) 200 (4) 300
12. A person makes a profit of ₹ 60000 in his business. 40% of the profit he reinvests in his business for its diversification. Of the remaining profit he distributes 30% as bonus to his employees, 20% he denotes in charity and rest on advertisement. Find the amount spent on advertisement.
(1) ₹ 18000 (2) ₹ 12000
(3) ₹ 16000 (4) ₹ 20000
13. If 60% of students in a school are boys and the total number of girls in the school is 460, find the number of boys in the school.
(1) 680 (2) 690
(3) 700 (4) 720
14. Find the total output of a coal-mine, if after 24% wastage the net output is 68,400 tonnes.
(1) 95000 tonnes
(2) 85000 tonnes
(3) 90000 tonnes
(4) None of these
15. If A's salary is 50% more than B's then by what per cent B's salary is less than A's salary ?
(1) 50 % (2) 25%
(3) 23% (4) 33.3%
16. Quicklime contains 28.6% of oxygen by weight. Determine the weight of oxygen in 750 gm quicklime.
(1) 214.5 gm (2) 224.5 gm
(3) 234.5 gm (4) 235.5 gm
17. Price of a commodity has increased by 60%. By what per cent must a consumer reduce the consumption of the commodity so as not to increase the expenditure ?
(1) 35.5 % (2) 37.5 %
(3) 38.5 % (4) 25%
18. Sohan saves 14% of his salary while George saves 22%. If both get the same salary and George saves ₹ 1540, find the savings of Sohan.
(1) ₹ 950 (2) ₹ 960
(3) ₹ 980 (4) ₹ 990
19. In a quarterly examination, a student secured 30% marks and failed by 12 marks. In the same examination, another student secured 40% marks and got 28 marks more than bare minimum marks to pass. Find the pass percentage.
(1) 24% (2) 28%
(3) 25% (4) 33%
20. In an election between two candidates A and B, A got 65% of the total votes cast and won the election by 2748 votes. Find the total number of votes cast if no vote is declared invalid.
(1) 9160 (2) 9260
(3) 9060 (4) 9360

PERCENTAGE

21. In an examination, 40% marks are required to pass. A obtains 10% less than the number of marks required to pass. B obtains

$11\frac{1}{9}\%$ less than A and C,

$41\frac{3}{17}$ per cent less than the num-

ber of marks obtained by A and B together. Marks obtained by C is

(1) 42 (2) 40

(3) 38 (4) 36

22. A reduction of 25% in the price of apples would enable a purchaser to get 2 kg apples more for Rs. 240. Find the original price per kg of apples.

(1) ₹ 35 (2) ₹ 30

(3) ₹ 40 (4) None of these

23. 10% of the soldiers of an army are killed in the battle. 10% of the remaining soldiers died of disease and 10% of the remaining men were disabled. Now only 729000 soldiers are left in the army. How many soldiers were there in all in the army in the beginning?

(1) 990000 (2) 9900000

(3) 9800000 (4) 1000000

24. From the salary of an officer 10% is deducted as house rent; 15% of the rest he spends on children's education; 10% of the balance he spends on clothes. After this expenditure, he is left with ₹ 2754. Find his salary.

(1) ₹ 4500 (2) ₹ 4000

(3) ₹ 4200 (4) None of these

25. The tax on an article decreases by 10% and its consumption increases by 10%. Find the effect per cent on its revenue.

(1) 1% increase (2) 2% decrease

(3) 1% decrease (4) 2% increase

26. In a direct election between two contestants for the post of secretary, 4% of the total votes cast are declared to be illegal. One contestant secures 55% of the valid votes and wins with a majority of 240 votes, find the total number of votes cast.

(1) 3500 (2) 2400

(3) 2200 (4) 2500

SHORT ANSWERS

1. (1)	2. (3)	3. (2)	4. (4)
5. (1)	6. (3)	7. (3)	8. (1)
9. (3)	10. (3)	11. (3)	12. (1)
13. (2)	14. (3)	15. (4)	16. (1)
17. (2)	18. (3)	19. (4)	20. (1)
21. (2)	22. (3)	23. (4)	24. (2)
25. (3)	26. (4)		

EXPLANATIONS

1. (1) Clearly, if the car is valued at Rs. 90 in 2000, it was valued at Rs. 100 in 1999.

∴ Value of the car in 1999

$$= \frac{145800 \times 100}{90}$$

In this way, value of car in 1997

$$= \frac{145800 \times 100 \times 100 \times 100}{90 \times 90 \times 90}$$

= Rs. 200000

2. (3) Percentage of students failed only in :

Physics = 42 - 14 = 28

Chemistry = 24 - 14 = 10

∴ Percentage of students who failed in Physics or Chemistry or both = 28 + 10 + 14 = 52

∴ Percentage of candidates who passed = 100 - 52 = 48

If the total number of students be x, then

$$x \times \frac{48}{100} = 72$$

$$\Rightarrow x = \frac{72 \times 100}{48} = 150$$

3. (2) Number of successful students :

$$\text{First Year} \Rightarrow \frac{7x \times 75}{100} = \frac{21x}{4} = 5.25x$$

$$\text{Second year} \Rightarrow \frac{8x \times 87.5}{100} = 7x$$

$$\text{Third year} \Rightarrow \frac{10x \times 93.75}{100}$$

= 9.375x

Total successful students

= 21.625x

Required percentage

$$= \frac{21.625x}{25x} \times 100 = 86.5\%$$

4. (4) In 100 gm of alloy,

Copper = 89 gm.

Let x gm. of copper be mixed.

$$\frac{89+x}{11} = \frac{90}{10}$$

$$\Rightarrow x = 99 - 89 = 10\text{gm}$$

To get 44 kg of new alloy, copper to be mixed

$$= \frac{44 \times 1000 \times 100}{1100} = 4 \text{ kg.}$$

5. (1) Let original fraction be $\frac{x}{y}$.

$$\therefore \frac{x \times 250}{y \times 400} = \frac{5}{18}$$

$$\Rightarrow \frac{x}{y} = \frac{5}{18} \times \frac{400}{250} = \frac{4}{9}$$

6. (3) In original alloy,

Gold = 40 gm

Silver = 10 gm

Let x gm of gold is added.

$$\therefore \frac{40+x}{50+x} = \frac{90}{100} = \frac{9}{10}$$

$$\Rightarrow 400 + 10x = 450 + 9x$$

$$\Rightarrow x = 50 \text{ gm.}$$

7. (3) $\frac{A \times 5}{100} = \frac{B \times 15}{100}$

$$\Rightarrow \frac{A}{B} = \frac{15}{5} = \frac{3}{1}$$

$$\text{Again, } \frac{B \times 10}{100} = \frac{C \times 20}{100}$$

$$\Rightarrow \frac{B}{C} = \frac{2}{1}$$

$$\therefore A : B = 3 : 1 = 6 : 2$$

$$B : C = 2 : 1$$

$$\therefore A : B : C = 6 : 2 : 1$$

$$\therefore \text{Total income} = 9 \times 2000$$

$$= \text{Rs. 18000}$$

8. (1) If the number of women be x, then men = 10000 - x

$$\therefore \frac{x \times 6}{100} + \frac{(10000 - x) \times 5}{100}$$

$$= 10540 - 10000 = 540$$

$$\Rightarrow 6x + 50000 - 5x = 54000$$

$$\Rightarrow x = 4000$$

9. (1) Original price of wheat = Rs. x /kg.

$$\text{New price} = \text{Rs. } \frac{79x}{100} \text{ per kg}$$

$$\therefore \frac{100}{79x} - \frac{100}{x} = 10.5$$

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- $\Rightarrow 100 \left(\frac{100 - 79}{79x} \right) = 10.5$
 $\Rightarrow 100 \times 21 = 10.5 \times 79x$
 $\Rightarrow \frac{79x}{100} = \frac{21}{10.5} = \text{Rs. } 2.50 \text{ per kg}$
- 10.** (3) Total marks obtained = 25 + 30 + 70 = 125
- 11.** (3) If the number be x , then
- $$\frac{x}{2} - 50 = 50$$
- $$\Rightarrow \frac{x}{2} = 100$$
- $$\Rightarrow x = 200$$
- 12.** (1) Total profit = ₹ 60000
 Amount reinvested in business = 40% of ₹ 60000 = ₹ 24000
 Remaining amount of the profit = 60% of ₹ 60000 = ₹ 36000
 Bonus to employees = 30% of ₹ 36000 = ₹ 10800
 Donation for charity = 20% of ₹ 36000 = ₹ 7200
 Amount spent on advertisement = ₹ (36000 - 10800 - 7200) = ₹ 18000
- 13.** (2) Let the total number of students be x .
 Given, Number of boys
- $$= \frac{60}{100}x \quad \dots\dots\dots (i)$$
- Number of girls = 460
 \Rightarrow Number of boys = $x - 460$ (ii)
 From equations (i) and (ii),
- $$\Rightarrow x - 460 = \frac{60x}{100}$$
- $$\Rightarrow 460 = \frac{40}{100}x$$
- $$\Rightarrow x = \frac{460 \times 100}{40} = 1150$$
- \therefore Number of boys = 1150 - 460 = 690.
- 14.** (3) Let the total output be x tonnes.
 Then, net output
- $$= x - \frac{24}{100} \times x = \frac{76x}{100}$$
- $$\Rightarrow \frac{76}{100}x = 68,400$$
- $$\Rightarrow x = \frac{68,400 \times 100}{76}$$
- $$= 90,000 \text{ tonnes.}$$

- 15.** (4) Let the salary of B = ₹ 100.
 Then, salary of A
- $$= 100 + \frac{50}{100} \times 100 = ₹. 150$$
- \therefore B's salary is ₹ 50 less than A's salary.
 \therefore Percentage of B's income less than A = $\frac{50}{150} \times 100$
- $$= \frac{100}{3} = 33\frac{1}{3}\%$$
- Hence, B's salary is less than A's salary by 33.3%.
- 16.** (1) 100 gm quicklime contains oxygen = 28.6 gm.
 \therefore 1 gm quicklime contains oxygen = $\frac{28.6}{100}$
- Hence, 750 gm quicklime contains oxygen = $\frac{28.6}{100} \times 750$
- $$= 214.5 \text{ gm.}$$
- Hence, weight of oxygen in 750 gm quicklime is 214.5 gm.
- 17.** (2) Let the price of commodity be ₹ x per kg.
 Increase in price = 60%
 \therefore Increased price of 1 kg = ₹ 1.6x
 If ₹ 1.6x is price of 1 kg
- $$x \text{ is price of } \frac{x}{(1.6)x} = \frac{10}{16} \text{ kg}$$
- \therefore In order to keep the expenditure same, consumption should be reduced by
- $$1 - \frac{10}{16} = \frac{16 - 10}{16} = \frac{6}{16} \text{ kg}$$
- Percentage reduction in consumption
- $$= \frac{6}{16} \times 100 = \frac{75}{2} = 37.5\%$$
- 18.** (3) Let the total salary of each of them = ₹ x .
- Sohan saves = ₹. $\frac{14}{100}x$
 and George saves
- $$= \frac{22}{100}x = 1540$$
- $$\Rightarrow x = ₹ 7000$$
- \therefore Sohan saves = $\frac{14}{100} \times 7000$
- $$= ₹ 980$$

- 19.** (4) Let the maximum marks be x .
 A student scored = $\frac{30}{100}x$, and failed by 12 marks.
- $$\therefore \text{Passing marks} = \frac{30}{100}x + 12$$
- Another student scored = $\frac{40}{100}x$ and got 28 marks more than passing marks.
- $$\therefore \text{Passing marks} = \frac{40}{100}x - 28$$
- $$\Rightarrow \frac{30}{100}x + 12 = \frac{40}{100}x - 28$$
- $$\Rightarrow \frac{10}{100}x = 40 \Rightarrow x = 400$$
- \therefore Maximum marks = 400
 Hence, Passing marks
- $$= \frac{30}{100} \times 400 + 12 = 132$$
- \therefore Pass percentage
- $$= \frac{132}{400} \times 100 = 33\%$$
- The pass percentage = 33%
- 20.** (1) Let the total number of votes cast = x .
 Number of votes got by
- $$A = \frac{65}{100}x \quad \dots\dots\dots (i)$$
- $$\Rightarrow B \text{ got}$$
- $$= x - \frac{65}{100}x = \frac{100x - 65x}{100} = \frac{35}{100}x$$
- A won the election by 2748 votes.
 \therefore Number of votes for A
- $$= \frac{35}{100}x + 2748 \quad \dots\dots\dots (ii)$$
- Form equations (i) and (ii),
- $$\Rightarrow \frac{65}{100}x = \frac{35}{100}x + 2748$$
- $$\Rightarrow \frac{30x}{100} = 2748$$
- $$\Rightarrow x = \frac{2748 \times 100}{30} = 9160$$
- \therefore Total number of votes cast = 9160
- 21.** (2) Suppose the maximum marks = 100
 \therefore Marks required to pass = 40
 \therefore A gets 10% less than pass marks.
 \therefore Marks secured by



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$$A = \frac{40 \times 90}{100} = 36$$

\therefore B gets $11\frac{1}{9}\%$ marks less than A.

\therefore Marks secured by B

$$= \frac{36 \times \left(100 - 11\frac{1}{9}\right)}{100}$$

$$= \frac{36 \times \left(\frac{900 - 100}{9}\right)}{100}$$

$$= 36 \times \frac{800}{9} \times \frac{1}{100} = 32$$

Total marks obtained by A and B = $36 + 32 = 68$

\therefore C gets $41\frac{3}{17}\%$ marks less than the marks obtained by A and B together.

\therefore C's marks

$$= \frac{68 \times \left(100 - 41\frac{3}{17}\right)}{100}$$

$$= \frac{68 \times \left(100 - \frac{700}{17}\right)}{100}$$

$$= \frac{68 \times \frac{1000}{17}}{100}$$

$$= 68 \times \frac{1000}{17} \times \frac{1}{100} = 40$$

- 22.** (3) Let the original price be ₹ x per kg.

$$\text{Reduction in price} = ₹ \frac{25}{100}x$$

$$\therefore \text{Reduced price} = x - \frac{25}{100}x$$

$$= \frac{75}{100}x \quad \dots (i)$$

With ₹ 240, purchaser can purchase 2 kg more apples.

Now, 25% of 240

$$= \frac{25}{100} \times 240 = ₹ 60$$

\Rightarrow Reduced price of 2 kg of apples = Rs. 60

\therefore Reduced price of 1 kg of apples = ₹ 30 $\dots (ii)$

From equations (i) and (ii),

$$\frac{75}{100} \times x = 30$$

$$\Rightarrow x = \frac{30 \times 100}{75} = ₹ 40$$

The original price of 1 kg apples = Rs. 40.

- 23.** (4) Let the total number of soldiers in all in the army in the beginning = 100.

\therefore Number of soldiers killed in the battle

$$= \frac{10}{100} \times 100 = 10$$

\therefore Remaining soldiers

$$= 100 - 10 = 90$$

Number of soldiers who died of

$$\text{disease} = \frac{10}{100} \times 90 = 9$$

\therefore Remaining soldiers = $90 - 9 = 81$

Number of disabled soldiers

$$= \frac{10}{100} \times 81 = \frac{81}{10}$$

\therefore Remaining soldiers

$$= 81 - \frac{81}{10} = \frac{810 - 81}{10} = \frac{729}{10}$$

\therefore If $\frac{729}{10}$ soldiers are left, then

total number of soldiers = 100

\therefore If 1 soldier is left, then total number of soldiers

$$= \frac{100 \times 10}{729}$$

\therefore If 729000 soldiers are left, then total number of soldiers

$$= \frac{100 \times 10 \times 729000}{729} = 1000000$$

- 24.** (2) Let the salary be ₹ 100. Then, House rent = ₹ 10; Balance = ₹ $(100 - 10) = ₹ 90$.

Expenditure on children's education = 15% of ₹ 90

$$= \frac{15 \times 90}{100} = ₹ \frac{27}{2}$$

$$\text{Balance now} = \left(90 - \frac{27}{2}\right)$$

$$= \left(\frac{180 - 27}{2}\right) = ₹ \frac{153}{2}$$

Expenditure on clothes

$$= \left(10\% \text{ of } \frac{153}{2}\right) = ₹ \left(\frac{153}{20}\right)$$

Now, balance

$$= \left(\frac{153}{2} - \frac{153}{20}\right) = ₹ \frac{1377}{20}$$

If last balance is ₹ $\frac{1377}{20}$, then

salary = ₹ 100.

If last balance is ₹ 2754, then salary

$$= ₹ \left(\frac{100 \times 20}{1377} \times 2754\right)$$

$$= ₹ 4000.$$

- 25.** (3) Let the original consumption be 1 unit & tax on it be ₹ 100. So, revenue = ₹ $(100 \times 1) = ₹ 100$. New consumption

$$= \left(\frac{110}{100} \times 1\right) = \frac{11}{10} \text{ units.}$$

Now, tax on 1 unit = ₹ 90

Tax on $\frac{11}{10}$ units

$$= \left(90 \times \frac{11}{10}\right) = ₹ 99.$$

\therefore Decrease in revenue = 1 %.

- 26.** (4) Suppose total number of votes cast = x .

\therefore Number of illegal votes = 4%

$$\text{of } x = \frac{4x}{100} = \frac{x}{25}$$

\therefore Number of valid votes

$$= x - \frac{x}{25} = \frac{25x - x}{25} = \frac{24x}{25}$$

Votes secured by the contestant who is defeated

$$= \frac{24x}{25} - \frac{24x}{25} \times \frac{55}{100}$$

$$= \frac{24x}{25} \left(1 - \frac{55}{100}\right) = \frac{24x}{25} \times \frac{45}{100}$$

According to the question,

$$\frac{24x}{25} \times \frac{55}{100} - 240 = \frac{24x}{25} \times \frac{45}{100}$$

$$\Rightarrow \frac{24x}{25} \left(\frac{55}{100} - \frac{45}{100}\right) = 240$$

$$\Rightarrow \frac{24x}{25} \cdot \frac{10}{100} = 240$$

$$\Rightarrow \frac{24x}{250} = 240$$

$$\Rightarrow x = \frac{250 \times 240}{24} = 2500$$

\therefore Total number of votes cast = 2500