BODMAS Rules and Simplification:-

BODMAS stands for

B — Brackets
O — OF
D — Division
M — Multiplication
A — Addition
S — Subtraction

(1Q) $12573 + 43495 + 23472 = ?$

Ans:- 12573
$+\ 43495$
$\ \ 23472$
$\overline{79540}$

(2Q) $(8 \div 88) \times 8888088 = ?$

Ans:- $\frac{8}{88_{11}} \times 8888088$

$\Rightarrow \frac{8888088}{11} = 808008$

(3Q) The value of $1001 \div 11$ of 13 is ?

Ans:- $1001 \div 11$ of 13

$\Rightarrow 1001 \div 143$

$\Rightarrow 7$

(4Q) $20\frac{1}{2} + 30\frac{1}{3} - 15\frac{1}{6} = ?$

Ans- $\frac{41}{2} + \frac{91}{3} - \frac{91}{6}$

$= \frac{123+182-91}{6} = \frac{214}{6}$

$= 35\frac{2}{3}$.

(5Q) Simplify $2-[2-\{2-2(2+2)\}] = ?$

Ans:- $= 2-[2-\{2-2(4)\}]$

$= 2-[2-\{2-8\}]$

$= 2-[2-(-6)] = 2-[8] = -6.$

6Q Simplify $18-[5-\{6+2(7-\{8-5\})\}]$

Ans:- $18-[5-\{6+2(7-3)\}]$

$= 18-[5-\{6+2(4)\}]$

$= 18-[5-\{6+8\}]$

$= 18-[5-14]$

$= 18-(-9)$

$= 18+9$

$= 27$

7Q $(-5)(4)(2)\left(\frac{-1}{2}\right)$

Ans:- $(-5)(4)(2)\left(\frac{-1}{2}\right)$

$\Rightarrow (-5)(-1)(3)$

$= 15$

8Q Find the value of $\frac{(6+6+6+6)}{4+4+4+4}$

Ans:- $\frac{(6+6+6+6)\div 6}{4+4+4+4\div 4}$

$= \frac{24\div 6}{4+4+4+1} = \frac{4}{13}$.

9Q what is the value of $\frac{P+Q}{P-Q}$ if $\frac{P}{Q}=7$?

Ans Given $\frac{P}{Q}=7 \Rightarrow P=7Q$

$\frac{P+Q}{P-Q} = \frac{7Q+Q}{7Q-Q} = \frac{8Q}{6Q} = \frac{4}{3}$.

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Decimal fractions:-

(1Q) If $204 \div 12.75 = 16$ then $2.04 \div 1.275 = ?$

Aug:- $204 \div 12.75 = 16$

$\Rightarrow \frac{204}{12.75} = 16$

$\Rightarrow \frac{204}{100} \times \frac{10}{12.75} = 16 \times \frac{10}{100}$ (Multiply with $\frac{10}{100}$)

$\Rightarrow 2.04 \times \frac{1}{1.275} = \frac{16}{10}$

$\Rightarrow 2.04 \div 1.275 = 1.6$

(2Q) $0.03 \times 0.0124 = ?$

Aug:- $0.\underset{\leftarrow 2}{03} \times 0.\underset{\leftarrow 4}{0124} = 0.\underset{\leftarrow 6}{000372}$

(Hint)
124
3
372

(3Q) $7212 + 15.231 - ? = 6879$

Aug:- $7212 + 15.231 - ? = 6879$

$\Rightarrow 7212 + 15.231 - 6879 = ?$

$\Rightarrow ? = 348.231$ Aug

(Hint)
7212
$+ 15.231$
7227.231
$- 6879$
348.231

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4Q) $4211.01 + 22.261 - ? = 2645.759$

Ans $4211.01 + 22.261 - ? = 2645.759$

$4211.01 + 22.261 - 2645.759 = ?$

$? = 1587.512$ Ans

(Hint)

4211.01

$(+)\ 22.26$) A

4233.27 Ann

$(-)\ 2645.75$ y

1587.51

5Q) $0.\underset{3}{\underset{\leftarrow}{004}} \times 0.\underset{1}{\underset{\leftarrow}{5}} = ?$

Ans $0.\underset{4}{\underset{\leftarrow}{0020}}$ Ans

6Q) $24.39 + 562.093 + 35.96 = ?$

Ans 24.39

562.093

35.96

622.443

Ans: 622.443

7Q) $926 + 9.026 + 0.92 + 9.0026 = ?$

Ans: 926

9.026

0.926

9.0026 y

944.9546

Ans: 944.95

8Q) The Expression $(12.86 * 12.86 + 12.86 \times P + 0.14 \times 0.14$ will be a perfect Square for P equal to ?

Ans $(12.86 \times 12.86 + 12.86 \times P + 0.14 \times 0.14)$ is in the form $a^2 + 2ab + b^2$; $a = 12.86$, $b = 0.14$

Here $P = 2b \Rightarrow P = 2 \times 0.14 = 0.28$

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(3Q) If the number is 481*673 is completely divisible by 9, then the smallest whole number in place of * will be. (4)

Ans:- Given number 481*673

481*673 is divisible by 9 if 4+8+1+*+6+7+3

= 29+* is divisible by 9

If * = 7 then 29+7 = 36 is divisible by 9

$\therefore$ * = 7 Ans

(4Q) If the number 97215*6 is divisible by 11, then the smallest whole number in the place of * will be.

Ans Given number 97215*6

9+2+5+6 = 22

7+1+* = 8+*

22-(8+*) = 14-*

If * = 3 then 14-3 = 11 is divisible by 11

$\therefore$ * = 3.

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(58) If the number 91876*2 is divisible by 8, then the smallest whole number in place of * will be?

Aw:- Given number 91876*2

91876*2 is divisible by 8 if 6*2 is divisible by 8

If * = 7 then 672 is divisible by 8

∴ * = 7 Ans

(59) Find the least value of * for which 7*5462 is divisible by 9.

Aw:- Given number 7*5462

7*5462 is divisible by 9 if 7+*+5+4+6+2 is divisible by 9

⇒ 24 + * is divisible by 9

If * = 3 then 24 + 3 = 27 is divisible by 9

∴ * = 3

(60) Find the least value of * for which 4832*18 divisible by 11

Aw Given number 4832*18

4 + 3 + * + 8 = 15 + *

8 + 2 + 1 = 11

⇒ (15 + *) − 11 = 4 + *

If * = 7 then 4 + 7 = 11 is divisible by 11

∴ * = 7 Ans

L.C.M and H.C.F

(1) What is the L.C.M of 12, 36 and 20?

2	12, 36, 20
2	6, 18, 10
3	3, 9, 5
	1, 3, 5

Aw: 2 × 2 × 3 × 1 × 3 × 5

= 180

(2) Find (H.C.F)/(G.C.D) of 108, 288 and 360.

108	288	360
2 | 54	2 | 144	2 | 180
3 | 27	2 | 72	2 | 90
3 | 9	2 | 36	5 | 45
3	2 | 18	3 | 9
	3 | 9	3
	3	

⇒ $2^2 \times 3^3$ ⇒ $2^5 \times 3^2$ ⇒ $2^3 \times 5 \times 3^2$

Aw: $2^2 \times 3^2$

= 4 × 9 = 36

(40) Find the G.C.D of 24, 16 ?

Ans

24	16
2 | 24	2 | 16
2 | 12	2 | 8
2 | 6	2 | 4
3	2
$2^3 \times 3$	2^4

Ans: $2^3 = 8$

(41) Two numbers are in the ratio 2:3. If their L.C.M is 48. what is Sum of the numbers

Ans let two numbers be $2x, 3x$

$$L.C.M = 48$$

$$x \,|\, 2x, 3x$$
$$2, 3$$

(42) The ratio of two numbers is 4 : 5. If the H.C.F of these numbers is 6, what is their L.C.M ? (6)

Sol let two numbers be $4x, 5x$

$$H.C.F = 6.$$

$$L.C.M \Rightarrow x \,|\, 4x, 5x$$
$$4, 5$$

Here $x = H.C.F = 6.$

$$L.C.M = x \times 4 \times 5$$
$$= 6 \times 4 \times 5 = 120$$

Hint:- For two numbers

2 | 2, 4

1, 2

H.C.F = 2

L.C.M = 2 × 1 × 2 = 4

(43) The H.C.F of two numbers is 5 and their L.C.M is 150. If one of the numbers is 25 then the other is?

Sol $H.C.F = 5; L.C.M = 150$

H.C.F × L.C.M = Product of two numbers

(7Q) The H.C.F of two numbers is 11 and their L.C.M is 693. If one of the numbers is 77, then find other?

Ans:- H.C.F = 11; L.C.M = 693

H.C.F × L.C.M = Product of two numbers

Given one number = 77

other number = x

$\Rightarrow 11 \times 693 = 77 \times x$

$\Rightarrow x = \frac{11 \times 693}{77} = 99$ Ans

other number is 99

(8Q) Find L.C.M of $\frac{2}{3}, \frac{8}{9}, \frac{16}{81}$ and $\frac{10}{27}$

$$L.C.M = \frac{L.C.M \text{ of numerator}}{H.C.F \text{ of denominator}}$$

$$L.C.M = \frac{L.C.M\,(2,8,16,10)}{H.C.F\,(3,9,81,27)}$$

$$= \frac{80}{3}.$$

Averages

(1Q) The average of 5, 10, 15, 20, 25 ?

Sol. $Avg = \frac{5+10+15+20+25}{5} = \frac{75}{5} = 15$

(2Q) Find the average of first 40 natural numbers.

Sol. Sum of first 'n' natural numbers $= \frac{n(n+1)}{2}$

Sum of first 40 natural numbers $= \frac{40(41)}{2}$

$$Avg = \frac{\text{Sum of observations}}{\text{no. of observations}} = \frac{\frac{40(41)}{2}}{40} = \frac{41}{2} = 20.5$$

(3) The avg of four consecutive even numbers is 27. Find the largest of these numbers.

Sol:- Let the even numbers be $x, x+2, x+4, x+6$

Avg of these numbers is 27.

$\Rightarrow \frac{x+(x+2)+(x+4)+(x+6)}{4} = 27$

$\Rightarrow \frac{4x+12}{4} = 27$

$\Rightarrow \frac{4(x+3)}{4} = 27 \Rightarrow x = 27-3 = 24.$

Largest number is $x+6 \Rightarrow x=24$ $24+6=30$.

(48) The average of five consecutive odd numbers is 61. What is the difference between highest and least numbers?

Ans. Let the five odd numbers be $x, x+2, x+4, x+6, x+8$

$$\text{Avg} = 61$$

$$\Rightarrow \frac{x+(x+2)+(x+4)+(x+6)+(x+8)}{5} = 61$$

$$\Rightarrow \frac{5x+20}{5} = 61$$

$$\Rightarrow \frac{5(x+4)}{5} = 61$$

$$\Rightarrow x+4 = 61 \Rightarrow x = 61-4$$

$$= 57$$

least number $x = 57$

Highest number $x+8 = 65$

difference of 65 & 57 $= 65-57$

$$= 8$$

(49) The avg of 5 numbers is 15 and avg of first 3 numbers is 10. What is the avg of last two numbers

Sol:- Let numbers be n_1, n_2, n_3, n_4, n_5

Avg of 5 numbers = 15

$$\Rightarrow \frac{n_1+n_2+n_3+n_4+n_5}{5} = 15 \Rightarrow n_1+n_2+n_3+n_4+n_5 = 15\times5$$

$$\Rightarrow n_1+n_2+n_3+n_4+n_5 = 75$$

Avg of first 3 numbers = 10

$$\Rightarrow n_1+n_2+n_3 = 3\times10 = 30$$

$$n_1+n_2+n_3+n_4+n_5 = 75$$

$$n_1+n_2+n_3 = 30$$

(−) (−)

$$n_4+n_5 = 45$$

$$\frac{n_4+n_5}{2} = \frac{45}{2} = 22.5$$

$\therefore$ Avg of last two numbers is 22.5

(50) The avg age of 15 students of a class is 15 years. Out of these, the avg age of 5 students is 14 years and that of the other 9 students is 16 years. The age of 15th student is ?

Ans:- The avg age of 15 students is 15

i.e., Sum of ages of 15 students $= 15\times15 = 225$

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Avg age of 5 students is 14 years
i.e., Sum of age of 5 students $= 5 \times 14$
$= 70$

Avg age of 9 students is 16 years
i.e., Sum of age of 9 students $= 9 \times 16$
$= 144$

Age of 15th student = Sum of age of 15 students
− Sum of age of 5 students
− Sum of age of 9 students
$= 225 - 70 - 144$
$= 11$ Ans

(7Q) The average of 5 numbers is 15 and the average of first three numbers is 10 and average of last three numbers is 20. Then find the middle number?

Ans The avg of
Let the numbers be n_1, n_2, n_3, n_4, n_5

Avg of 5 numbers is 15
i.e., $n_1 + n_2 + n_3 + n_4 + n_5 = 5 \times 15 = 75 \rightarrow (1)$

Avg of first three numbers = 10
i.e., $n_1 + n_2 + n_3 = 3 \times 10 = 30 \rightarrow (2)$

Avg of last three numbers = 20
i.e., $n_3 + n_4 + n_5 = 20 \times 3 = 60 \rightarrow (3)$

(2) + (3)
$n_1 + n_2 + 2n_3 + n_4 + n_5 = 90 \rightarrow (4)$

(4) − (1)
$n_1 + n_2 + 2n_3 + n_4 + n_5 = 90$
$n_1 + n_2 + n_3 + n_4 + n_5 = 75$
(−) (−) (−) (−) (−)

$\therefore n_3 = 15$

$\therefore$ Middle number = 15.

(8Q) The avg of five numbers is 27. If one number is excluded, the avg becomes 25. The excluded number is?

Ans:- Avg of five numbers is 27
i.e., Sum of let numbers be n_1, n_2, n_3, n_4, n_5
Sum of five numbers $\Rightarrow n_1 + n_2 + n_3 + n_4 + n_5 = 5 \times 27$
$= 135 \rightarrow (1)$

Avg of four numbers = 25
i.e., $n_1 + n_2 + n_3 + n_4 = 25 \times 4 = 100 \rightarrow (2)$

Ratios & Proportion

(1Q) If $A:B = 2:3$ and $B:C = 4:7$ then $A:B:C =$?

Aw $A:B = 2:3$

$B:C = 4:7$

$A:B:C = (2\times4) : (4\times3) : (3\times7)$

$= 8:12:27$

(2Q) If $A:B = 2:3$ and $B:C = 3:4$ then find $A:B:C$ =

Aw $A:B = 2:3$

$B:C = 3:4$

$A:B:C = (2\times3) : (3\times3) : (3\times4)$

$= 6:9:12$

$= 2:3:4$

(3Q) If $a:b = 2:3$ and $b:c = 3:5$ then find $a:c$ =

Aw $a:b = 2:3$

$b:c = 3:5$

$a:b:c = (2\times3) : (3\times3) : (3\times5)$

$= 6:9:15$

$a:c = 2:5$

(4Q) If $2a = 3b$ and $4b = 5c$ then $a:c$ is ——

Aw $2a = 3b \Rightarrow \frac{2a}{3b} = 1 \Rightarrow \frac{a}{b} = \frac{3}{2}$

$4b = 5c \Rightarrow \frac{4b}{5c} = 1 \Rightarrow \frac{b}{c} = \frac{5}{4}$

$\frac{a}{b} \times \frac{b}{c} = \frac{3}{2} \times \frac{5}{4}$

$\Rightarrow \frac{a}{c} = \frac{15}{8}$

(5Q) Find the mean proportion of 9 and 25

Aw mean proportion $b = \sqrt{ac}$

Here $a = 9$; $c = 25$

$b = \sqrt{9\times25} = 3\times5 = 15.$

(6Q) Find the third proportional to 16 and 4

Aw $a:b = b:c$ Here $a = 16$; $b = 4$

$16:4 = 4:c$

Product of means = product of Extremes

$\Rightarrow 16 \times C = 4 \times 4$

$\Rightarrow 16C = 16$

$\Rightarrow C = 1$

$\therefore$ Third proportion $\Rightarrow C = 1$

(7Q) If $\frac{A}{3} = \frac{B}{4} = \frac{C}{5}$ then $A:B:C$ is

Ans $\frac{A}{3} = \frac{B}{4} = \frac{C}{5} = x$

$\Rightarrow A = 3x;\ B = 4x;\ C = 5x$

$A:B:C = 3x : 4x : 5x$

$= 3:4:5$

(8Q) If $\frac{1}{5} : \frac{1}{x} :: \frac{1}{x} : \frac{1}{125}$ then the value of x is

Ans $\frac{1}{5} : \frac{1}{x} :: \frac{1}{x} : \frac{1}{125}$

Product of means = Product of Extremes

$\frac{1}{x} \times \frac{1}{x} = \frac{1}{5} \times \frac{1}{125}$

$\frac{1}{x^2} = \frac{1}{625} \Rightarrow x^2 = 625$

$x = \sqrt{\ }$

Percentages

(1Q) $8\frac{1}{3}\%$ expressed as fraction is ?

Ans To express percentage as fraction divide with 100

i.e., $\frac{8\frac{1}{3}\%}{100} = \frac{25}{3 \times 100_4} = \frac{1}{12}$.

(2Q) 2 is what percent of 50?

Ans $2 = ?\%$ of 50

$\Rightarrow 2 = \frac{?}{100_2} \times 50$

$\Rightarrow ? = 4$

Hints for Percentages

what $\rightarrow$?

of $\rightarrow \times$

% $\rightarrow \frac{1}{100}$

is $\rightarrow =$

(3Q) what percent of $\frac{1}{2}$ is $\frac{1}{3}$?

Ans $?\%$ of $\frac{1}{2} = \frac{1}{3}$

$\Rightarrow \frac{?}{100} \times \frac{1}{2} = \frac{1}{3}$

$\Rightarrow ? = \frac{200}{3} = 66.6667$

(4Q) $x\%$ of y is $y\%$ of ?

Ans $\frac{x}{100} \times y = \frac{y}{100} \times ? \Rightarrow ? = x$ Ans: x

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(5Q) what is 25% of 25% equal to ?

Ans:- $\frac{25}{100} \times \frac{25}{100} = \frac{1}{16}$.

(6Q) 30% of 140 = ? % of 840

Ans $\frac{30}{100} \times 140 = \frac{?}{100} \times 840$

$\Rightarrow ? = \frac{30 \times 140}{840}$

$= \frac{5}{\cancel{100}}$ Ans

(7Q) 5% of (50% of Rs. 300) is ?

Ans $\frac{5}{100} \times \frac{50}{100} \times 300 = 7.5$

(8Q) 270 Candidates appeared in an examination of which 252 passed. The pass percentage is ?

Ans:- $\Rightarrow \frac{252}{270} \times 100$

$\Rightarrow 0.9333 \times 100 = 93.33\%$

Profit and loss

→ Gain = Selling price (S.P) − Cost price (C.P)

$= S.P - C.P$

→ Loss = Cost price (C.P) − Selling price (S.P)

$= C.P - S.P$

→ Gain % $= \frac{\text{Gain} \times 100}{C.P}$; Loss % $= \frac{\text{Loss} \times 100}{C.P}$

→ $C.P = \left(\frac{100}{100 + \text{Gain}\%}\right) \times S.P$; $C.P = \left(\frac{100}{100 - \text{Loss}\%}\right) \times S.P$

→ $S.P = \left(\frac{100 + \text{Gain}\%}{100}\right) \times C.P$; $S.P = \left(\frac{100 - \text{Loss}\%}{100}\right) \times C.P$

Problems

1) A man buys a Cycle for Rs. 1400 and sells it at a loss of 15%. What is the selling price of the cycle?

Ans Cost price = ₹ 1400

loss % = 15%

Selling price (S.P) $= \left(\frac{100 - \text{Loss}\%}{100}\right) \times C.P$

$= \frac{100 - 15}{100} \times 1400$

$\Rightarrow 85 \times 14 = ₹ 1190.$

2) The cost price of 21 articles is equal to Selling price of 18 articles. Find the gain (or) loss percent.

Sol: Let C.P = x ; S.P = y

Cost price of 21 articles = S.P of 18 articles

$\Rightarrow 21x = 18y$

$\Rightarrow y = \frac{21x}{18} = \frac{7x}{6}$

$$\text{Gain\%} = \frac{\text{S.P} - \text{C.P}}{\text{C.P}} \times 100 = \frac{\frac{7x}{6} - x}{x} \times 100$$

$$= \frac{7x - 6x}{6x} \times 100$$

$$= \frac{x}{6x} \times 100$$

$$\Rightarrow \frac{100}{6} = 16\frac{4}{3}\%$$

3) A man buys an article for ₹ 27.50 and sells it for ₹ 28.60. Find his gain percent.

Sol:- C.P = ₹ 27.50 ; S.P = ₹ 28.60

Gain = S.P − C.P = 28.60 − 27.50

= ₹1.10

$$\text{Gain\%} = \frac{\text{Gain}}{\text{C.P}} \times 100 = \frac{1.10}{27.50} \times 100 = 4\%$$

4) An article is bought for ₹ 450 and sold for ₹ 400. (15)
What is the loss% ?

Sol: C.P = 450 ; S.P = 400

Loss = C.P − S.P = 450 − 400 = ₹ 50

$$\text{Loss\%} = \frac{\text{loss}}{\text{C.P}} \times 100 = \frac{50}{450} \times 100 = \frac{100}{9} = 11\frac{1}{9}\%$$

5) When a Commodity is Sold for ₹ 34.80 there is a loss of 25%, what is the Cost price of Commodity.

Sol:- S.P = ₹ 34.80, loss% = 25%

$$\text{C.P} = \left(\frac{100}{100 - \text{loss\%}}\right) \times \text{S.P} = \left(\frac{100}{100-25}\right) \times 34.80$$

$$= \frac{100}{75} \times 34.80$$

$$= \frac{4}{3} \times 34.80$$

= ₹46.4

6) An article is Sold at Certain price. By Selling it at $\frac{2}{3}$ of that price one losses 10%. Find the gain percent at original price.

Sol: Let the cost price = ₹ x/-

Selling price = ₹ $\frac{2}{3}x$/-

Gain = S.P − C.P = $\frac{2}{3}x - x = \frac{1}{3}x$.

Gain% = $\frac{\text{Gain}}{C.P} \times 100$

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

4) Meena purchased two fans each at ₹ 1200. She sold one fan at the loss of 5% and other at the gain 10%. Find the total gain or loss percent?

Ans:- Cost price of two fans = ₹1200 + ₹1200

= ₹ 2400/-

S.P of 1st fan (@ 5% loss) = $\left(\frac{100 - \text{loss}\%}{100}\right) \times$

$= \frac{100-5}{100} \times 1200$

= ₹1140/-

S.P of 2nd fan (@ 10% gain) = $\left(\frac{100 + \text{Gain}\%}{100}\right) \times$

$= \left(\frac{100+10}{100}\right) \times$ C.P

$= \frac{110}{100} \times 1200$

= ₹1320/-

Total S.P of two fans = 1140 + 1320

= 2460

Gain% = $\frac{\text{Gain}}{C.P} \times 100$ (18)

$= \frac{60}{2400} \times 100 = 2.5\%$

Partnership

1) Dhilip and Manohar started a business by investing ₹ 1,00,000 and ₹ 1,50,000 respectively. Find the share of each out of a profit of ₹ 24,000?

Ans Ratio of Investment of Dhilip & Manohar is

= 1,00,000 : 1,50,000

= 10 : 15

= 2 : 3

Total profit = ₹ 24,000/-

Dhilip share = $\frac{2}{5} \times 24,000 = 9600$

Manohar share = $\frac{3}{5} \times 24,000 = 14,400$

2) A and B started a business and invested ₹ 20,000 and ₹ 25,000 resp. After 4 months B left and C joined by investing ₹ 15,000. At the end of the year there was a profit of ₹ 4600. What is the share of ~~Naresh~~ 'C'?

Ans Ratio of A, B, C Investments

A : B : C = 20,000 × 12 : 25,000 × 4 : 15,000 × 6

= 12 : 5 : 6.

Total profit = ₹ 4600

Share of C = $\frac{6}{23} \times 4600^{200}$

= ₹ 1200/-

3) Three partners A, B, C starts a business. Twice investment of A is equal to thrice the Capital of B and Capital of B is four times the Capital of C. Find the share of each out of a profit of ₹ 2,97,000

Ans- Given 2A = 3B

B = 4C

Let Capital of 'C' be ₹ x /-

⇒ Capital of B = 4x/-

⇒ Capital of 2A = 3(4x) = 12x

⇒ A = 6x/-

A : B : C = 6x : 4x : x

= 6 : 4 : 1

Total profit = ₹ 2,97,000/-

Share of A = $\frac{6}{11} \times 2,97,000^{27000}$ = 1,62,000/-

Share of B = $\frac{4}{11} \times 2,97,000^{27000}$ = 1,08,000/-

Share of C = $\frac{1}{11} \times 2,97,000^{27000}$ = 27000./-

4) A, B, C hire meadow for ₹ 2934.60. A puts in 10 oxen for 20 days; B 30 oxen for 8 days and C 16 Oxen for 9 days. Find the rent paid by each?

Ans Ratio of A, B, C ⇒ A : B : C

⇒ 10×20 : 30×8 : 16×9

= 25 : 30 : 18.

Total Rent paid = ₹ 2934.60

A Rent = $\frac{25}{73} \times 2934.60^{40.2}$ = 1005/-

B Rent = $\frac{30}{73} \times 2934.60^{40.2}$ = 1206/-

C Rent = $\frac{18}{73} \times 2934.60^{40.2}$ = 723.6/-

5) A and B started a business in partnership by Investing ₹ 8000 and ₹ 7000 resp. If at the end of a year, a profit of ₹ 22,500 was earned. What is the share of A

Ans Ratio of Investments = ₹8000 : 7000
= 8 : 7

Total profit = 22500
Share of A = $\frac{8}{15} \times 22500^{1500}$
= 12000.

6) In partnership business, A has Invested ₹ 4200 while B has Invested a certain amount. If out of the Overall profit of ₹ 600. A's share is ₹ 320. What is the amount Invested by B ?

Ans A's Investment = 4200
B's Investment = x/-
Total profit = ₹ 600/-
A's share in profit = ₹ 320/-
B's share in profit = ₹ 600/- 320/- = 280/-

Ratio of Investments = Ratio of profit
4200 : x = 320 : 280

⇒ 4200 × 280 = 320 x

⇒ x = $\frac{4200 \times 280}{320}$ = 3675.

∴ B's Investment = ₹ 3675.

7) A and B started a business in partnership by Investing ₹ 15000 and ₹ 18000 resp. If at the end of the year, A's share in the Profit was ₹ 1200. what was the amount of total profit ?

Ans Ratio of A & B Investment
⇒ A : B = 15000 : 18000
= 5 : 6

A's share in profit = 1200
Let Total profit be ₹ x/-
⇒ A's profit ⇒ 1200 = $\frac{5}{11} \times$ x

⇒ x = $\frac{11 \times 1200}{5}$ = 2640.

Total profit = ₹ 2640/-

8) In a business, A has Invested ₹ 2000 for 5 months, while B has Invested ₹ 3500 for a certain period. If out of the total annual profit of ₹ 1440. B share has been ₹ 840. For how many months has he kept his Investment in the business ?

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Ans Ratio of A & B Investments

$A : B = 8000 \times 5 : 3500 \times 8$

$\Rightarrow 20 : 7 8$

Total profit = 1440,

B's share = 840 ; A share = 1440 − 840 = 600

Ratio of A & B profit's

$\Rightarrow 600 : 840 = 5 : 7$

Ratio of Investments = Ratio of profits

$\Rightarrow 20 : 7x = 5 : 7$

$\Rightarrow 20 \times 7 = 7x \times 5$

$\Rightarrow 8 = 4$ months

Simple and Compound Interest

1 — Find the Simple Interest on ₹ 7500 in 4 years at 15% ?

→ Simple Interest (S.I) = $\frac{PTR}{100}$

where P = Principal Sum
T = Time
R = rate of Interest

→ Compound Interest :

$$\text{Amount} = P\left(1 + \frac{R}{100}\right)^n$$

where P = Principal
R = Rate of Interest ; n = Time

Compound Interest = Amount − Principal.

→ If the Interest is Compounded anually, then

$$\text{Amount} = P\left(1 + \frac{R}{100}\right)^n$$

→ If the Interest is Compounded half-yearly then

$$\text{Amount} = P\left(1 + \frac{R/2}{100}\right)^{2n}$$

→ If the Interest is Compounded Quarterlyearly then

$$\text{Amount} = P\left(1 + \frac{R/4}{100}\right)^{4n}.$$

1) Find the Simple Interest on ₹ 7500 in 4 years at 15% ?

Ans P = 7500, T = 4 ; R = 15%

$S.I = \frac{PTR}{100} = \frac{7500 \times 4 \times 15}{100} = 4500/-$

2) The Simple Interest on ₹ 6400 at $12\frac{1}{2}$% per annum is ₹ 2000. Find the period ?

Ans S.I = 2000/- ; P = ₹ 6400 ; $R = 12\frac{1}{2} = \frac{25}{2}$ %

$S.I = \frac{PTR}{100}$

$\Rightarrow 2000 = \frac{6400 \times T \times \frac{25}{2}}{100}$

$\Rightarrow 2000 = 32 \times T \times 25$

$\Rightarrow T = \frac{2000}{800} = 2\frac{1}{2} = 2$ years 6 months

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3) On what sum of money [illegible] ₹ 2000 in 5 years 8% per annum.

Sol:- S.I = 2000/- ; T = 5 ; R = 8 %

P = ?

$S.I = \frac{PTR}{100} \Rightarrow 8000 = \frac{P \times 5 \times 8}{100} \Rightarrow P = \frac{8000}{5 \times 8}$

$\Rightarrow P = 5000/-$

4) A Sum of ₹ 1600 gives a Simple Interest of ₹ 252 in 2 years and 4 months. The rate of Interest per annum is ?

Sol: P = 1600 ; S.I = 252 ; T = 2 years. 4 months

$= 2 + \frac{4}{12} = 2 + \frac{1}{3} = \frac{7}{3}$ yrs

$S.I = \frac{PTR}{100} \Rightarrow 252 = \frac{1600 \times \frac{7}{3} \times R}{100}$

$\Rightarrow R = \frac{252 \times 3}{16 \times 7} = 6.75\%$

5) Find the Compound Interest on ₹ 8000 for 3 years at 5% per annum.

Sol: P = 8000 ; n = 3 ; R = 5%

$Amount = P\left(1 + \frac{R}{100}\right)^n = 8000\left(1 + \frac{5}{100}\right)^3$

$= 8000\left(1 + \frac{1}{20}\right)^3 = 8000\left(\frac{21}{20}\right)^3$

Divisibility Rules:-

Rule for 2:- If the last digit ends in 0, 2, 4, 6 or 8.

Rule for 3:- If the Sum of the digits in the number is divisible by 3.

Rule for 4:- If the last two digits of the number is divisible by 4

Rule for 5:- If the last digit ends in 0 or 5

Rule for 6:- If the number is divisible by 2 and 3.

Rule for 8:- If the last three digits are divisible by 8

Rule for 9:- If the Sum of the digits in the number is divisible by 9.

Rule for 10:- If the last digit ends in '0'.

Rule for 11:- If the difference between the Sum of the odd numbered digits and the Sum of the even numbered digits is a multiple of 11

Ex:- 10813

1 + 8 + 3 = 12

0 + 1 = 1

12 - 1 = 11 ✓

11 ÷ 11

Then 10813 ÷ 11

(19) If the number 5*2 is divisible by 6 then * ?

Ans:- Given number 5*2

5*2 is divisible by 6 if 5*2 is divisible by 2 a

5*2 is divisible by 2. Because the last digit of 5*

5*2 is divisible by 3 if 5+*+2 = 7+* is d

by 3.

If * = 2 then 7+2 = 9 is divisible by 3.

∴ * is '2'.

(20) If the number 517*324 is divisible by 3. then the Smallest whole number in place of * will be.

Ans:- Given number 517*324

517*324 is divisible by 3 if 5+1+7+*+3+2+

is divisible by 3

⇒ 22+* is divisible by 3.

If * = 2 then 22+* = 24 is divisible by 3

∴ * is '2'.

Steps to find day of given date:- (21)

1. Take last digits of year
2. Divide it by 4 (Take qudient)
3. Take the date
4. Take the year code 5) Take the month code
6. Add above results (i.e.,1+2+3+4+5steps)
7. Divide the result by 7 then take remainder.
8. Compare the remainder with day code and identify the da

Problems

1) what was the day of 15th August, 1947?

Ans 1. 47
2. 11
3. 15
4. 00
5. 73
6. 146 = 7

1) 47 1) Take last digits of year = 47
2) 11 2) Divide it by 4 = 11
3) 3) Take the date = 15
4) Take the year code = 00
5) Take the month code = 02

75/7 = 5 (Rem

∴ Day = Friday

2) Today is monday. After 61 days, it will be?

Ans Today is monday.

After 9 weeks i.e., 7×9 = 63rd day is monday

= 62nd day is Sunday

= 61st day is Saturday

(Hint: Find the Closest multiple of 7 for the given

3) The last day of a Century cannot be?

Ans 1 century = 100 years → 76 ordinary years (76×1)
→ 24 leap years (24×2)
= 124 odd days
= 17 weeks + 5 odd days

∴ No. of odd days in 100 years = 5 odd days

200 years = (5×2) = 10 (÷7) = 3 odd days

300 years = (5×3) = 15 (÷7) = 1 odd day

400 years = (5×4)+1 = 21 (÷7) = 0 odd days

For 100 years → day ends with Friday
200 years → day ends with wednesday
300 years → day ends with monday
400 years → day ends with Sunday

∴ The last day of Century cannot be Tuesday, Thursday, Saturday.

4) What was the day of the week on 16th July, 1776?

Ans
1) Take last two digits of year = 76
2) Divide it by 4 = 19
3) Take the date = 16
4) Take the year code = 04
5) Take the month code = 06
6) Add above results = 121
7) Divide it by 7 = 02 (remainder)

Ans: Tuesday

5) It was Sunday on Jan 1, 2006. what was the day of the week Jan 1, 2010?

Ans
2007 → 1 odd day
2008 → 2 odd days
2009 → 1 odd day
2010 → 1 odd day
5 odd days
↓
(Friday).

6) What was the day of the week on 28th May, 2006?

Ans:-
1) last two digits of Year = 06
2) Divide it by 4 = 01
3) Take the date = 28
4) Take the year code = 06
5) Take the month code = 01
6) Add above results = 42
7) Divide it by 7 = 00

Ans: Sunday.

7) What will be the day of the week, 15th August, 2010?

Ans:-
1) last two digits of year = 10
2) Divide it by 4 = 2
3) Take the date = 15
4) Take the year code = 06
5) Take month code = 02
6) Add above results = 35
7) Divide it by 7 = 00 Ans: Sunday