

Unit-1

$$\text{Q1) } \frac{(789 \times 789 \times 789) + (211 \times 211 \times 211)}{789 \times 789 - 789 \times 211 + 211 \times 211}$$

$$\begin{aligned} & \cancel{(789)^3 + (211)^3} \\ & \cancel{(789)^2 - (789 \times 211) + (211)^2} \\ a^2 - ab + b^2 &= (a-b)^2 + ab. \\ & \cancel{(789)^3 + (211)^3} \\ & \cancel{(789 - 211)^2 + (789 \times 211)}. \end{aligned}$$

$$\begin{array}{r} 789 \\ 211 \\ \hline 578 \\ 11 \\ \hline 729 \\ 211 \\ \hline 1000 \end{array}$$

$$a^3 + b^3 = (a+b)^3 - (a+b)(a^2 - ab + b^2).$$

$$\frac{(789)^3 + (211)^3}{(789)^2 - (789 \times 211) + (211)^2} = 789 + 211 = 1000.$$

$$\text{Q2) } \text{Q3) } (387 \times 387) + (113 \times 113) + 2(387)(113)$$

$$\begin{aligned} a^2 + b^2 + 2ab &= (a+b)^2 \\ &= (387 + 113)^2 = (500)^2 \\ &= 250000. \end{aligned}$$

$$\begin{array}{r} 387 \\ 113 \\ \hline 500 \end{array}$$

$$\text{Q4) } (87 \times 87) + (61 \times 61) - 2(87)(61).$$

$$\begin{aligned} a^2 + b^2 - 2ab &= (a-b)^2 \\ (87 - 61)^2 &= (26)^2 \\ &= 676. \end{aligned}$$

$$\begin{array}{r} 87 \\ 61 \\ \hline 26 \end{array}$$

$$(3) \quad 197 * 5462$$

Divisibility rule of 9 :-

For divisibility of 9 all of the numbers in
the digits

$$(3) \quad 197 * 5462$$

Divisibility rule of 9 :-

If sum of the digits of the number is
divisible by 9 then the whole number is
divisible by 9.

$$197 * 5462 = 1 + 9 + 7 + * + 5 + 4 + 6 + 2 \\ = 34 + *$$

The number should be divisible by 9.

So least value of * is 2.

$$\therefore 34 + 2 = 36$$

which is divisible by 9.

∴ Least value of * is 2.

$$(4) \quad \text{LCM of } 2^2 * 3^3 * 5 * 7^2, 2^3 * 3^2 * 5^2 * 7^4, \\ 2 * 3 * 5^3 * 7 * 11.$$

In LCM we consider the power of numbers
with highest powers.

The given numbers are

$$2^2 * 3^3 * 5 * 7^2$$

$$2^3 * 3^2 * 5^2 * 7^4$$

$$2 * 3 * 5^3 * 7 * 11$$

$$\text{LCM} = 2^3 * 3^3 * 5^3 * 7^4 * 11$$

$$= 8 * 27 * 125 * 2401 * 11 = 713097000.$$

LCM = product of prime factors with highest powers (when numbers were in the product of powers)

$$(5) S.P = \text{Rs. } 14,500/-$$

Loss % = 20%

~~$$C.P = \frac{100}{100 - \text{Loss \%}} \times S.P.$$~~

$$C.P = \frac{100}{100 - 20} \times 14,500$$

$$= \frac{100}{80} \times 14,500$$

$$= 100 \times 181.25$$

$$= 18,125$$

$$C.P = 18,125/-$$

~~$$(6) \text{ cost of each T.V = Rs. } 14,400/-$$~~

~~cos profit %, for each T.V = 20%.~~

~~If production cost increase by 15% then~~

~~$$C.P = \text{actual C.P} + 15\% \text{ of C.P}$$~~

~~$$= 14,400 + \frac{15}{100} \times 14,400$$~~

~~$$= 14,400 + 2160$$~~

~~$$= 16,560$$~~

~~$$\text{cost price (C.P) new } = 16,560/-$$~~

1000.

What was the S.P to gain 15%.

$$S.P = \frac{100 + \text{gain}}{100} \times C.P$$

$$= \frac{100 + 15}{100} \times 16560$$

$$= \frac{115}{10} \times 1656$$

$$= \frac{190440}{10}$$

$$= 19,044/-$$

$$\begin{array}{r} 323 \\ 1656 \\ \times 115 \\ \hline 18280 \\ 1656 \\ \hline 190440 \end{array}$$

New S.P = 19,044/- to gain 20% after increasing the cost production by 15%.

Q. Find S.P of each T.V = Rs. 14,400/-
gain % for each T.V = 20%.

$$C.P = \frac{100}{100 + \text{gain}} \times S.P \quad 12) \overline{120} \\ 1440$$

$$= \frac{100}{120} \times 14,400$$

$$= 100 \times 120$$

$$= 12,000$$

C.P for each T.V = Rs. 12,000/-

If product cost increases by 15% then

$$\text{new C.P} = C.P + \frac{15}{100} \times C.P$$

$$= 12,000 + \frac{15}{100} \times 12,000$$

$$= 12,000 + 1800$$

$$\text{new C.P} = 13,800$$

$$\begin{array}{r} .12 \\ \times 15 \\ \hline 60 \\ 12 \\ \hline 180 \end{array}$$

S.P. to gain 15%.

$$\begin{aligned} S.P. &= \frac{100 + \text{gain}}{100} \times C.P. \\ &= \frac{100 + 15}{100} \times 13,800 \\ &= 115 \times 138. \\ &= 15,870/- \end{aligned}$$

$\begin{array}{r} 14 \\ 138 \\ \times 115 \\ \hline 1690 \\ 138 \\ \hline 15,870 \end{array}$

(ii) Let us assume each 1 kg cost - Rs. 1000/-
gain

The dealer sells 960 gms for 1 kg cost.

$$\begin{aligned} \text{gain} &= 1000 - 960 \\ &= 40. \\ C.P. &= 960 \\ S.P. &= 1000. \end{aligned}$$

$$\begin{aligned} \text{gain \%} &= \frac{\text{gain}}{C.P.} \times 100 \\ &= \frac{40}{960} \times 100 \\ &= \frac{400}{96} \\ &= \frac{100}{24} \\ &= 4.16\%. \end{aligned}$$

$\begin{array}{r} 3 \\ 96 \\ \times 4 \\ \hline 384 \\ 96 \\ \hline 416 \end{array}$

$$(8) \text{ loss \%} = 6\frac{1}{4}\% = \frac{25}{4}\%$$

$$\text{weight} = 12\frac{1}{2}\% = \frac{25}{4}\% \Rightarrow \text{loss}$$

net C.P of 1 kg = Rs. 1/-

$$\text{S.P of } (100 - \frac{25}{4})\% \text{ of } 1 \text{ kg} = (1 - \frac{25}{4})\%$$

$$\text{S.P of } 875 \text{ gm} = \text{Rs. } 0.9375/-$$

$$\text{S.P of } 1 \text{ Kg} = \frac{0.9375}{875} \times 1000$$

$$= \text{Rs. } 1.071/-$$

$$\text{profit} = \frac{\text{gain}}{\text{C.P}} \times 100$$

$$= \frac{1.071 - 1}{1} \times 100$$

$$= 7.14\%$$

19) net S.P of a object = Rs. 100/-

the series discount = 10%, 20%, 30%.

(100 - 10)% of (100 - 20)% of (100 - 30)% of 100.

100
100

90% of 80% of 70% of 100.

1
72
x 7
504

$$\frac{90}{100} \times \frac{80}{100} \times \frac{70}{100} \times 100$$

$$\frac{9 \times 8 \times 7}{10} = \frac{504}{10}$$

$$= 50.4.$$

Rs. 50.4/-

$$\text{Total discount} = 100 - 50.4$$

$$= 49.6.$$

$$\text{discount} = \text{Rs. } 49.6/-$$

~~the discount is 49.6%.~~

(10) Given Market price or S.P. of shirt = Rs. 150/-

-After Applying 12.5% discount.

$$\text{S.P. of shirt} = 150 - 150 \times \frac{12.5}{100}$$

$$= 150 - 18.75$$

$$= 131.25$$

$$\begin{array}{r} 12.5 \\ \times 15 \\ \hline 625 \\ 125 \times \\ \hline 187.5 \end{array}$$

After Apply x% discount S.P. = Rs. 105/-

$$131.25 - 131.25 \times \frac{x}{100} = 105$$

$$131.25 - (131.25x) = 10500.$$

$$13125 - 10500 = 131.25(x)$$

$$\frac{2625}{131.25} = x.$$

$$x = 20\%$$

first discount = 20%.

$$\begin{array}{r} 1 \\ 72 \\ \times 7 \\ \hline 504 \end{array}$$