

Weekend Assignment - Comparing Quantities

$$1. \quad \frac{32}{100} \times x = 48$$

$$x = \frac{48 \times 100}{32}$$

$$= 150$$

$$2. \quad \frac{25}{100} \times \frac{300}{100} \times 800$$

$$= 60$$

$$3. \quad x + \frac{18}{100}x = 236$$

$$1.18x = 236$$

$$x = 200$$

$$4. \quad x - \frac{20}{100}x = 80$$

$$0.8x = 80$$

$$x = 100$$

$$5. \quad P \rightarrow x, Q \rightarrow 2x, R \rightarrow 4x$$

$$x + 2x + 4x = 350$$

$$7x = 350$$

$$x = 50$$

$$P \rightarrow 50$$

$$Q \rightarrow 100$$

$$R \rightarrow 200$$

$$6. \quad x + \frac{10}{100}x = \frac{110x}{100} \quad (10\% \text{ incr.})$$

$$\frac{110x}{100} - \frac{10}{100}x = \frac{100}{100}x \quad (10\% \text{ decr.})$$

$$= \frac{99}{100}x$$

$$\text{Net change} = x - \frac{99}{100}x$$

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

$$\% \text{ change} = \frac{x}{100 \times x} \times 100$$

$$= 1$$

1% change

7. $\frac{75x}{100} - \frac{60}{100}x = 82.5$

$$\frac{15x}{100} = 82.5$$

$$x = \frac{82.5 \times 100}{15}$$

$$= 550$$

$$10\% \text{ of } 550 = 55$$

8. No. of boys = $\frac{5}{8} \times 40$

$$= 25$$

$$\text{No. of girls} = 15$$

$$\text{No. of boys passed} = \frac{84}{100} \times 25$$

$$= 21$$

$$\text{No. of girls passed} = \frac{92}{100} \times 15$$

$$\approx 14$$

9. SP = ₹820 Loss = 10% CP = x

$$\frac{100}{90} = \frac{820}{x}$$

$$x = \frac{100 \times 820}{90}$$

$$= ₹911.11$$

10. Profit = SP - CP, Loss = CP - SP

Case 1

Case 2

$$P = 810 - CP$$

$$L = CP - 530$$

$$\text{Profit} = \text{Loss}$$

$$810 - CP = CP - 530$$

$$2CP = 810 + 530$$

$$= 1350$$

$$CP = \frac{1350}{2}$$

$$= 675$$

11 CP of 1 ruler = x
 SP of 10 rulers = CP of 15 rulers
 $\therefore$ SP of 10 rulers = $15x$
 SP of 1 ruler = $\frac{15x}{10} = 1.5x$

$$\begin{aligned}\text{Gain \%} &= \frac{1.5x - x}{x} \times 100 \\ &= \frac{0.5x}{x} \times 100 \\ &= 50\%\end{aligned}$$

12 CP of 2 articles = ₹15
 CP of 1 = ₹7.5
 SP of 3 articles = ₹25
 SP of 1 article = ₹ $\frac{25}{3}$

$$\begin{aligned}\text{Gain} &= \frac{25}{3} - \frac{15}{2} \\ &= \frac{5}{6} \\ \text{Gain \%} &= \frac{\frac{5}{6}}{\frac{15}{2}} \times 100 \Rightarrow \frac{5}{6} \times \frac{2}{15} \times 100 \\ &= \frac{100}{9} \text{ or } 11.1\%\end{aligned}$$

13 SP of speaker = ₹768

Loss = 20%

To find CP: (x)

$$\frac{100}{80} = \frac{x}{768}$$

$$\begin{aligned}x &= \frac{76800}{80} \\ &= 960\end{aligned}$$

To gain 20%,

$$\begin{aligned}\text{SP} &= 960 + \frac{20}{100} \times 960 \\ &= 960 + 192 \\ &= ₹1152\end{aligned}$$

14. Option A.

$$SP = ₹ 38000 \quad \text{Gift worth} = ₹ 3000$$

$$\text{Net gain} = ₹ 3000$$

Option B

8% discount

$$\text{Net gain} = \frac{8}{100} \times 38000$$

$$= 3040$$

Option 2 is better as $3040 > 3000$

15. I discount

$$7500 - \frac{10}{100} \times 7500$$

$$= 6750$$

II discount

$$6750 - \frac{20}{100} \times 6750$$

$$= 6750 - 1350$$

$$= ₹ 5400$$

$$16. A = P \left(1 + \frac{R}{100}\right)^n$$

$$2028 = P \left(1 + \frac{4}{100}\right)^2$$

$$= P \left(\frac{26}{25} \times \frac{26}{25}\right)$$

$$P = 2028 \times \frac{25}{26} \times \frac{25}{26}$$

$$= ₹ 1875$$

$$17. 4096 = 3375 \left(1 + \frac{40}{600}\right)^n$$

$$\frac{4096}{3375} = \left(\frac{16}{15}\right)^n$$

$$\sqrt[3]{4096} = 16, \quad \sqrt[3]{3375} = 15$$

$$R = 13\frac{1}{3} = \frac{40}{3} \text{ per}$$

$$\frac{R}{2} = \frac{20}{3} = \frac{40}{6} \text{ (half-year)}$$

$$1 + \frac{40}{600} = \frac{16}{15}$$

$$\frac{16^3}{15^3} = \frac{16^n}{15^n}$$

$$n = 3 \Rightarrow 1\frac{1}{2} \text{ years}$$

18. $P = ₹ 5000$, $n = 1 \text{ yr}$ $R = 2\% \text{ pa}$
half-yearly $\rightarrow R = 1\%$

CI - SI

$$\begin{aligned} \text{CI} \Rightarrow A &= 5000 \left(1 + \frac{1}{100}\right)^2 \\ &= 5000 \times \frac{101}{100} \times \frac{101}{100} \\ &= 5100.5 \end{aligned}$$

$$\text{CI} = 100.5$$

$$\text{SI} = \frac{5000 \times 2 \times 1}{100}$$

$$= 100$$

$$\text{Diff} = 100.5 - 100$$

$$= ₹ 0.50$$

19. $CI - SI = 20$, $P = 8000$, $n = 2$ yrs.

$$CI = P \left(1 + \frac{R}{100}\right)^2 - P$$

$$SI = \frac{2PR}{100}$$

$$\left(1 + \frac{R}{100}\right)^2 =$$

$$1 + \left(\frac{R}{100}\right)^2 + \frac{2R}{100}$$

$$CI - SI \Rightarrow$$

$$P \left(1 + \left(\frac{R}{100}\right)^2 + \frac{2R}{100}\right) - P - \frac{2PR}{100} = 20$$

$$\cancel{R} + P \left(\frac{R}{100}\right)^2 + \cancel{\frac{2PR}{100}} - \cancel{R} - \cancel{\frac{2PR}{100}} = 20$$

$$P \left(\frac{R}{100}\right)^2 = 20$$

$$\left(\frac{R}{100}\right)^2 = \frac{20}{8000}$$

$$\left(\frac{R}{100}\right)^2 = \frac{1}{400}$$

$$\frac{R^2}{100} = \frac{1}{20}$$

$$R = 4\%$$

20. Cost = ₹18000 depr. = 16%. $T = 2$ yrs

$$\text{Depreciated value} = 18000 \left(1 - \frac{16}{100}\right)^2 \quad 1 - \frac{4}{25}$$

$$= 18000 \times \frac{21}{25} \times \frac{21}{25} \quad \frac{21}{25}$$

$$= ₹12700.8$$