Percentage, Profit and Loss

QUESTIONS

| 1. | 1. 72% of 25 students are good at mathematics. How many students are not good at it? | | | | | | | |
|-----|---|--|------------------------------|---|--|--|--|--|
| | (a) 8 | (b) 10 | (c) 12 | (d) 7 | | | | |
| 2. | A nursery has 500 | 00 plants, 5% of the p | lants are roses and 19 | % are mango plants. What is the total | | | | |
| | number of other plants? | | | | | | | |
| | (a) 2700 | (b) 3700 | (c) 4700 | (d) 5700 | | | | |
| 3. | What is the percer | nt of pure gold in 22-ca | arat gold, if 24-carat g | arat gold is hundred percent pure gold? | | | | |
| | (a) $90\frac{1}{3}\%$ | (b) $91\frac{2}{3}\%$ | (c) $94\frac{1}{3}\%$ | (d) $95\frac{2}{3}\%$ | | | | |
| 4. | The price of suga | r goes up by 20%. By | what percent must th | ust the consumption to be reduced so that | | | | |
| | expenditure does not increase? | | | | | | | |
| | (a) $16\frac{2}{3}\%$ | (b) 15% | (c) $15\frac{2}{3}\%$ | (d) 16% | | | | |
| 5. | A number is increa | ased by 10% and then i | it is decreased by 10% | . What is the net increase or decrease? | | | | |
| | (a) 1% increase | (b) 1% decrease | (c) 2% increase | (d) 2% decrease | | | | |
| 6. | 6. A man's salary is increased by 10%. In order to have his salary back to the original amount, it is be reduced by x %, then value of x is | | | | | | | |
| | | | | | | | | |
| | (a) $11\frac{1}{9}\%$ | (b) $1\frac{11}{9}\%$ | (c) $11\frac{9}{11}\%$ | (d) $9\frac{1}{11}\%$ | | | | |
| 7. | the number is | | | | | | | |
| | (a) 350 | (b) 240 | (c) 360 | (d) 260 | | | | |
| 8. | A candidate gets ' | ndidate gets 71% of votes and wins the election by 756 votes. If there are only two can the total number of votes is | | | | | | |
| | then the total number of votes is | | | | | | | |
| | (a) 1800 | (b) 1850 | (c) 1860 | (d) 1812 | | | | |
| 9. | A gets Rs. 5000. I | He spend 15% on study | y, 28% on house , 10% | as tax- His saving will be | | | | |
| | (a) 2500 | (b) 2400 | (c) 2350 | (d) 2450 | | | | |
| 10. | What per cent of an hour is 2 min? | | | | | | | |
| | (a) 3.2% | (b) 3.3% | (c) 3.6% | (d) 3.8% | | | | |
| 11. | A litre of water wa | is evaporated from 8L c | of salt solution contain | ning 8% salt. The percentage of salt left | | | | |
| | in the remaining solution is | | | | | | | |
| | (a) $7\frac{1}{7}\%$ | (b) $7\frac{1}{9}\%$ | (c) $9\frac{1}{7}\%$ | (d) $7\frac{1}{3}\%$ | | | | |
| 12. | Two numbers are | Gwo numbers are in ratio $3:4.\ 15\%$ of larger number added to 53 becomes equal to 25% of smaller | | | | | | |
| | plus 29. The smal | ler number is | | | | | | |
| | (a) 440 | (b) 640 | (c) 680 | (d) 480 | | | | |

| 13. | The number of enrolments in a school has increased from 1800 to 2016, The percentage increase in | | | | | | | |
|---|---|--------------------------|--|--|--|--|--|--|
| | the enrolments is | | | | | | | |
| | (a) 10% | (b) 11% | (c) 12% | (d) 13% | | | | |
| 14. | The price of a commodity is increased by 40% . By what per cent should a consumer reduce his | | | | | | | |
| | consumption so that his expenditure on the commodity remains constant? | | | | | | | |
| | (a) $25\frac{4}{7}\%$ | (b) $26\frac{4}{7}\%$ | (c) $27\frac{4}{7}\%$ | (d) $28\frac{4}{7}\%$ | | | | |
| 15. | If 60% of K is 30 |) less than 75% of K, t | hen what is the value o | of K? | | | | |
| | (a) 500 | (b) 300 | (c) 400 | (d) 200 | | | | |
| 16. | Ramu saves 14% of his salary while Ramesh saves 24%. If both get equal salaries and Ramesh saves | | | | | | | |
| | Rs. 1440, then Ramu's expenditure is | | | | | | | |
| | (a) Rs. 5000 | (b) Rs. 5160 | (c) Rs. 6000 | (d) Rs. 7440 | | | | |
| 17. | Rakesh purchase | ed a T.V. for Rs. 5000 | and paid Rs. 250 for i | ts transportation. If he sold the T.V. for | | | | |
| | Rs. 5075, find h | is profit or loss percen | tage. | | | | | |
| | (a) 3.33% | (b) 3.45% | (c) 3.56% | (d) 3.75% | | | | |
| 18. | By selling 24 pens, Kranthi lost an amount equal to the C.P. of 3 pens. Find his loss percentage | | | | | | | |
| | (a) 12.5% | (b) 13% | (c) 12.75% | (d) 13.5% | | | | |
| 19. | Naresh sold two books for Rs. 600 each thereby gaining 20% on one book and losing 20% on the | | | | | | | |
| | other book. Find his overall loss or gain percent. | | | | | | | |
| | (a) 8% | (b) 6% | (c) 4% | (d) 4.5% | | | | |
| 20. | A book with a m | arked price of Rs. 600 | ed price of Rs. 600 is available at a discount of 18%. Find the discount given and | | | | | |
| also the price at which the book is available for sale. | | | | | | | | |
| | (a) Rs. 492 | (b) Rs. 500 | (c) Rs. 495 | (d) Rs. 480 | | | | |
| 21. | By selling a watch for Rs. 1440, a man loses 10% . At what price should he sell it to gain 5% ? | | | | | | | |
| | (a) Rs. 1680 | (b) Rs. 1540 | (c) Rs. 1320 | (d) Rs. 1750 | | | | |
| 22 . | A man sells an article at a profit of 20%. If he had bought it at 20% less and sold for Rs. 5 less, he | | | | | | | |
| | would have gained 25%. Find the cost price of the article. | | | | | | | |
| | (a) Rs. 15 | (b) Rs. 20 | (c) Rs. 25 | (d) Rs. 35 | | | | |
| 23. | A sells a watch to B at 20% gain, B sells it to C at 15% gain and C sells it to D at a loss of 10% . If D | | | | | | | |
| | pays Rs. 1863 for it, then how much does A pay for it? | | | | | | | |
| | (a) Rs. 2000 | (b) Rs. 1000 | (c) Rs. 1500 | (d) Rs. 3000 | | | | |
| 24. | A man sold an article for Rs. 161, gaining $1/6^{ m th}$ of his outlay. Find the cost price of the article. | | | | | | | |
| | (a) 149 | (b) 168 | (c) 138 | (d) 156 | | | | |
| 25. | A grocer buys 8 | 0 kg of rice at Rs. 13. | 50 per kg and mixes it | with 120 kg of rice available at Rs. 16 | | | | |
| | per kg. At what i | rate per kg should he s | ell the mixture to gain | 20% on the whole? | | | | |
| | (a) 18 | (b) 16 | (c) 20 | (d) 22 | | | | |

| 26. | <u>3 bananas</u> are l | bought for Rs. 2 and s | old at 2 bananas for R | s. 3. Find the gain percent | • | | |
|-------------|---|------------------------|---------------------------|-----------------------------|--------|--|--|
| | (a) 100% | (b) 85% | (c) 125% | (d) 130% | | | |
| 27. | A vendor sells | lemons at 5 for a rupe | e gaining 40%. How m | any did he buy for a rupee | ? | | |
| | (a) 6 | (b) 7 | (c) 8 | (d) 10 | | | |
| 28 . | By selling 100 | pens, a shopkeeper ga | ains the selling price of | 20 pens. Find his gain pe | rcent? | | |
| | (a) 10% | (b) 15% | (c) 30% | (d) 25% | | | |
| 29 . | A trader lists his articles at 20% above cost price and allows a discount of 10% on cash payment. | | | | | | |
| | Find his gain percent. | | | | | | |
| | (a) 8% | (b) 9% | (c) 10% | (d) 12% | | | |
| 30. | An umbrella marked at Rs. 80 is sold for Rs 68. What is the rate of discount? | | | | | | |
| | (a) 15% | (b) 20% | (c) 25% | (d) 30% | | | |
| | | | | | | | |

| ANSWER - KEY | | | | | | | | | |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1. (d) | 2. (c) | 3. (b) | 4. (a) | 5. (b) | 6. (d) | 7. (c) | 8. (a) | 9. (c) | 10. (b) |
| 11. (c) | 12. (d) | 13. (c) | 14. (d) | 15. (d) | 16. (b) | 17. (a) | 18. (a) | 19. (c) | 20. (a) |
| 21. (a) | 22. (c) | 23. (c) | 24. (c) | 25. (a) | 26. (c) | 27. (b) | 28. (d) | 29. (a) | 30. (a) |

Answers and Solutions

1. (d): 72% are good

$$\Rightarrow$$
 Not good = 28%

Now 28% of
$$25 = \frac{28}{100} \times 25 = 7$$

2. (c): Other plants = 100% - 5% - 1% - 94%

$$94\% of 5000 = \frac{94}{100} \times 5000 = 94 \times 50 = 4700.$$

3. (b): $24 \, carrot \cong 100\%$

$$1 \text{ carat} \cong \frac{100\%}{24}$$

$$22 \operatorname{carat} \cong \frac{100\%}{24} \times 22 = \frac{100 \times 11}{12}\% = 91\frac{2}{3}\%.$$

4. (a): Without loss of generality, let present consumption be C kg & price be "p" Rs/kg

$$\therefore Cost = C \times p$$

Cost goes up by 20% = 1.2p Rs/kg

Let new consumption be C

$$\Rightarrow C \times 1.2p = C \times p$$

$$\Rightarrow C = \frac{C}{1.2} = \frac{10C}{12} = \frac{5C}{6}$$

 \therefore % age decrease in consumption

$$= \frac{C - \frac{5C}{6}}{C} \times 100\%$$
$$= \frac{1}{6} \times 100\% = 16\frac{2}{3}\%$$

5. (b): Let no. be x

10% increase $\Rightarrow x$ becomes 1.1x

Then 10% decrease $\Rightarrow 1.1x$ becomes $1.1x \frac{90}{100} = 0.99x$.

 $x \rightarrow 0.99 x \Rightarrow 1\%$ decrease.

6. (d): Similar to Q5

10% increase $\Rightarrow 1.1x$

Let decrease be p%

7.

$$\Rightarrow 1.1x \ becomes 1.1x \frac{(100-p)}{100} = x.$$

$$\Rightarrow 1.1(100-p) = 100$$

$$\Rightarrow 110-1.1p = 100$$

$$\Rightarrow 1.1p = 10$$

$$\Rightarrow p = \frac{10}{1.1} = \frac{100}{11} = 9\frac{1}{11}\%$$

(c): $\frac{40}{100}x - \frac{25}{100}x = 54$
$$\Rightarrow \frac{15}{100} = 54$$

$$\Rightarrow x = \frac{{}^{18}54 \times 100}{15} = 360$$

8. (a): Let total votes be 'x' Winning candidates = 0.71xLosing candidates = 0.29xMargin = 0.71x - 0.29x = 756= 0.42xm = 756= $x = \frac{756}{0.42} = \frac{75600}{42} = 1800.$

9. (c): Total expenditure

$$= \left(\frac{15}{100} + \frac{28}{100} + \frac{10}{100}\right) \times 5000$$
$$= \frac{53}{100} \times 5000 = 2650$$

: Savings
$$= 5000 - 2650 = 2350$$
.

10. (b): In one hour, we have 60 min

$$\Rightarrow \% age = \frac{2}{60} \times 100\% = \frac{100}{30}\% = 3.3\%.$$

11. (c): % age means $\frac{\text{weight}}{\text{volume}}$ % age \Rightarrow in 100 ml,



Salt being non-volatile, will not evaporate

In 81, we have
$$8000ml \Rightarrow \frac{8}{100} \times 8000$$
 gm salt = 640 gm salt.

After evaporation 7L solution is left with same 640 gm salt

$$=\frac{W}{V}\%=\frac{640\,gm}{7000\,mL}\times100\%=9\frac{1}{7}\%\,.$$

12. (d): Let nos. be 3x and 4x.

According to statement,

$$\frac{15}{100} \times 4x + 53 = \frac{25}{100} \times 3x + 29$$
$$\Rightarrow 53 - 29 = \frac{15}{100}x.$$
$$\Rightarrow 24 = \frac{15}{100}x$$
$$\Rightarrow \frac{24 \times 100}{15} = 160$$
$$3x = 480.$$

13. (c): % age increase =
$$\frac{2016 - 1800}{1800} \times 100\%$$

$$=\frac{216}{1800}\times100\%=12\%$$

14. (d): Let him consume 'x' kg previously Previous price = C Rs/kg $\Rightarrow \cos t = xC$ New price = 1.4C Rs/kg. Let new consumption decrease by p%.

$$\Rightarrow New \ consumption = \frac{x(100 - p)}{100} kg$$
$$\therefore New \ cost = \frac{x(100 - p)}{100} \times (1.4C)$$
$$\therefore \frac{x(100 - p)}{100} \times (1.4C) = xC$$
$$\Rightarrow 1.4(100 - p) = 100$$
$$\Rightarrow 140 - 1.4 = 100$$
$$\Rightarrow 40 = 1.4p$$
$$\Rightarrow p = \frac{40}{1.4} = \frac{40 \times 5}{7} = \frac{200}{7} = 28\frac{4}{7}\%$$

15. (d):
$$\frac{60}{100} \times K = \frac{75}{100} \times K - 30$$

 $\Rightarrow 30 = \left(\frac{75 - 60}{100}\right) \times K$
 $\Rightarrow \frac{15K}{100} = 30 \Rightarrow K = 200.$

16. (b): Let both have salaries = 'S' Saving (Ramu) = 0.14S Saving (Ramesh) = 0.24S Expenditure (Ramu) = 0.86S Now, 0.24S = 1440 = S = 6000 $\Rightarrow 0.86S = 6000 \times \frac{86}{100} = 60 \times 86 = 5160 / -$

17. (a): Total cost incurred = 5000 + 250 = 5250 / - S.P = 5075 $\Rightarrow LOSS = 5250 - 5075$ $\Rightarrow Loss\% = \frac{175}{5250} \times 1005$ $= \frac{7}{210} \times 100\%$

$$=\frac{1}{30} \times 100\%$$
$$= 3\frac{1}{3} \times 3.33\%$$

18. (a): Let C.P of one pen = xC.P of 3 pens = 3xLet him sell at p% loss

$$\Rightarrow S.P. = \frac{x(100 - p)}{100}$$
$$\Rightarrow S.P.(24 \text{ pens}) = \frac{24x(100 - p)}{100}$$
$$\therefore \frac{24x(100 - p)}{100} = 21x$$
$$\Rightarrow 24(100 - p) = 2100$$
$$\Rightarrow 300 = 24p$$
$$\Rightarrow p = 12.5\%$$

19. (c): C.P of 1^{s1} book be x_1

$$\therefore 1.2x_1 = 600$$

$$\Rightarrow x_1 = \frac{600}{1.2} = 500 / -$$

C.P of 2nd book be x_2

$$\therefore 0.8 x_2 = 600$$

$$\Rightarrow x_2 = \frac{600}{0.8} = 750 / -$$

$$\therefore x_1 + x_2 = total C.P. = 1250 / -$$

$$Total S.P = 1200 / -$$

$$\therefore Loss\% = \frac{50}{1250} \times 100\%$$

$$= \frac{1}{25} \times 100\% = 4\%$$

20. (a): M.P = 600/-
S.P =
$$600 \times \frac{(100 - 81)}{100} = 600 \times \frac{82}{100} = 492/-$$

21. (a):
$$C.P(watch) = \frac{1440/-}{0.9} = 1600/-$$

To gain 5%S. $P = 1600 \times 1.05 = 1680/-$.
22. (c): Let C.P =x
 $\therefore S.P = 1.2x$
Bought at 20% less $C.P. \Rightarrow C.P.' = 0.8x$
Sold at $(1.25x - 5)$
 $\Rightarrow Gain = \frac{(1.2x - 5) - 0.8x}{0.8x} \times 100\% = 25\%$
 $\Rightarrow \frac{0.4x - 5}{0.8x} = \frac{1}{4}$
 $\Rightarrow 1.6x - 20 = 0.8x$
 $\Rightarrow 0.8x = 20$
 $\Rightarrow 1x = 25/-$
23. (c): A's $C.P = x$
B's $C.P = 1.2x$
C's $C.P = 1.2x \times 1.15 = 1.38x$
D's $C.P = 1.38x \times 0.9$
Now, $1.38x \times 0.9 = 1863$
 $\Rightarrow x = \frac{1863}{1.38 \times 0.9} = \frac{2070}{1.38} = 1500/-$
24. (c): Let $C.P = x$

S.P =
$$x + \frac{1}{6}x = \frac{7}{6}x$$

Now, $\frac{7}{6}x = 161 \Rightarrow x = \frac{{}^{3}161 \times 6}{7} = 23 \times 6 = 138.$

25. (a): Total
$$C.P = 80 \times 13.5 + 120 \times 16$$

= 1080+1920
= 3000/-
20% gain ⇒ 3000×1.2 = 3600 / -
∴ Total rice = (80+120)kg = 200kg
∴ S.P = $\frac{3600 / -}{200}$ Rs / kg = 18Rs / kg.

26. (c): C.P (one banana) = (2/3) Rs. S.P (one banana) = (3/2) Rs.

$$\therefore gain\% = \frac{\frac{3}{2} - \frac{2}{3}}{\frac{2}{3} \times 1005}$$
$$= \frac{\frac{9 - 4}{6}}{\frac{2}{3}} \times 100\% = \frac{5}{4} \times 100\% = 125\%.$$

27. (b): Let C.P be 'x' per lemon S.P = 1/5 (for one lemon) $Gain\% = \frac{\frac{1}{5} - x}{5} \times 100\% = 40\%$

$$\Rightarrow \frac{\frac{1}{5} - x}{x} = \frac{2}{5}$$
$$\Rightarrow 1 - 5x = 2x$$
$$\Rightarrow 1 = 7x \Rightarrow x = \frac{1}{7}.$$

 \Rightarrow C.P OF 7 lemons = 1 rupees.

$$\Rightarrow S.P.(one \ pen) = x \times \left(\frac{100 + p}{100}\right)$$

On sale of 100 pens, S.P of 100 pens = $100x \left(\frac{100 + p}{100}\right)$

For 100 pens, gain

$$= S.P - C.P = x(100 + p) - 100x$$

This gain = S.P (20 pens)

$$= 20x \times \left(\frac{100 + p}{100}\right)$$
$$\Rightarrow px = \frac{x(100 + p)}{5}$$
$$\Rightarrow 5px = 100x + px$$

$$\Rightarrow 4px = 100x$$
$$\Rightarrow 4p = 100 = p = 20 \text{ or } 25\%$$

29. (a): Let C.P = x
L.P. (list price) = 1.2x
After discount,
$$S.P = 1.2x \frac{90}{100} = 1.08x$$

 $Gain \% = \frac{(1.08x - x)}{x} \times 100\% = 8\%$.
30. (a) Discount $\% = \frac{M.P - Price after discount}{M.P.} \times 100\% = \frac{80 - 68}{80} \times 100\%$
 $= \frac{12}{80} \times 100\%$
 $= \frac{3}{20} \times 100\% = 15\%$