

GATE



ALL BRANCHES

GENERAL APTITUDE

Quantitative Aptitude



Lecture No: 03

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TOPICS TO BE COVERED



Understanding Terms used in Topic



Concept of Profit Loss



Percentage concept in Discounts



Questionnaire on the Topic

$$1.20 - 1.11$$



Q.

The population of a village is 5500. If the number of males increases by 11% and the number of females increases by 20%, then the population becomes 6330. The population of the female in the village is

Assignment



2000



2500



3000



3500

$$\begin{aligned} (M + F) &= 5500 \times 1.11 \\ 1.11M + 1.2F &= 6330 \\ -1.11M + 1.11F &= 6105 \\ \hline 0.09F &= 225 \end{aligned}$$

$$\begin{aligned} F &= \frac{225}{0.09} \\ &= \underline{\underline{2500}} \end{aligned}$$

$$0.6 \times 0.5 = 0.3$$

Q.

Assignment

Rohan spends 40% of his monthly income on food items and 50% of the remaining on clothes and conveyance. He saves one-third of the remaining amount after spending on food, clothes and conveyance. If he saves Rs. 19200 every year, what is his monthly income?

A. 32000

B. 16000

C. 6000

D. 12000

$$\frac{19200}{12} = 1600$$

F \rightarrow 40%

Clothes & Conveyance \Rightarrow 30%

70%

$$\frac{1}{3} \times 30\%$$

T.I. = 16000

10% of T.I. = 1600



Q.

In a test of 80 questions, Santosh answered 75% of first 60 questions correctly. What % of remaining questions he has to answer correctly so that he can secure an overall percentage of 80 in the test?

Assignment

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

64 Correct

45

$$\frac{19}{20} \times 100 = 95\%$$

19

Questions

80

60

20?



$$P:Q:R = 6:2:1$$



Q.

5% of income of P is equal to 15% of income of Q and 10% of income of Q equal 20% of income of R. If R's income is 2000, then What is total income of P, Q and R?

Assignment

$$P = 12000$$
$$Q = 4000$$

$$R = 2000$$

$$\underline{\underline{P+Q+R = 18,000}}$$

$$(5\%P = 15\%Q) \times 2$$

$$(10\%Q = 20\%R) \times 3$$

$$10\%P = 30\%Q = 60\%R = k$$

$$P = k$$

$$Q = \frac{k}{3}$$

$$R = \frac{k}{6}$$

$$P:Q:R = 1:\frac{1}{3}:\frac{1}{6}$$
$$= 6:2:1$$



A.

9000



B.

12000



C.

15000



D.

18000

PROFIT & LOSS



Percentage

Investment

$$C - P =$$

gain/profit \times

% / P%

S.P. Return

~~M.P.~~

loss \times

%

discount

%

~~M.P.~~

Marked
Labelled
List
Tagged



$C.P < S.P \rightarrow \text{Profit}$

$C.P > S.P \rightarrow \text{Loss}$

$C.P = S.P \rightarrow \text{No P No L}$



$$S.P. > C.P.$$

= Profit

$$\frac{S.P.}{C.P.} > 1$$

$$\boxed{\frac{S.P.}{C.P.}}$$



$$S.P. < C.P.$$

= Loss

$$\frac{S.P.}{C.P.} < 1$$

$$\frac{3}{5}$$

$$S.P. = C.P.$$

= No Profit No Loss

$$\frac{S.P.}{C.P.} = 1$$



Note:

$$\boxed{\begin{array}{r} S.P \\ \hline C.P \end{array}}$$



Profit or loss percentage is to be applied always to the Cost Price only.

Discount percentage is to be applied always to the Marked Price only.



If selling price and cost price are in the ratio 5:4, then find the profit% or loss%.



$$\frac{S.P}{C.P} = \frac{5}{4} = 1.25$$

$\frac{S.P}{C.P}$

25% P.



Q.

A Fruit seller purchases 11 orange for Rs. 10 and sells 10 orange for Rs. 11. If he follows the same process, then, find his profit or loss%?

$$C.P = \frac{10}{11}$$

$$S.P = \frac{11}{10}$$

$$\frac{S.P}{C.P} = \frac{11}{10} \times \frac{11}{10}$$

$$= \frac{121}{100} = 1.21$$

$$10\%P \quad 10\%P$$

$$1.1 \times 1.1 = 1.21$$

$$\underline{\underline{21\%P}}$$

$$\frac{S.P}{C.P}$$



Q.

A milk vendor purchases milk at Rs. 72/ litre, and sells at Rs. 60/ litre. For every 1 litre milk he adds 200ml. of water. While selling milk he cheats 200ml. in 1 liter measurement. Find his Profit or Loss percentage.

S.P

$$\frac{S.P}{C.P}$$

$$= \frac{\cancel{60}^5}{\cancel{72}_2} \times \frac{\cancel{1200}^3}{\cancel{1800}_2} \times \frac{\cancel{1800}}{\cancel{800}_2}$$

$$= \frac{5}{4} = 1.25$$



Q.

A milk vendor purchases milk at Rs. 72/ litre, and sells at Rs. 60/ litre. For every 1 litre milk he adds 200ml. of water. While selling milk he cheats 200ml. in 1 liter measurement. Find his Profit or Loss percentage.

Chain Rule

Demand	Deliver
1000ml	800
<u>1500ml</u>	1200

$$\begin{aligned}
 &\underline{\underline{1000\text{ml}}} \rightarrow \underline{\underline{₹ 72}} \\
 &\quad \quad \quad \text{1200ml} \\
 &\quad \quad \quad \frac{18}{72} \times 100 \\
 &\quad \quad \quad = \underline{\underline{25\% P}}
 \end{aligned}$$

✓
₹ 90

$$1 - 0.8\bar{3} = 0.1\bar{6}$$



Q.

A cloth merchant purchases cloth at ₹80/meter and sells at ₹100/meter. As a festive offer, he gives 50% extra free on every demand. Find his profit% or loss%.



A.

8.33% Profit



B.

25% Profit



C.

83.33% Profit



D.

16.66% Loss

$$\frac{100}{120}$$

$$\frac{100}{150} = \frac{1}{1.5}$$

$$\frac{S.P.}{C.P.}$$

$$= \frac{100}{80} \times \frac{10}{15}$$

$$= \frac{5}{6} = 0.8\bar{3}$$

$$= 0.1\bar{6}$$



Q.

Due to downfall in the market, 'A' sells mangoes to 'B' saying "FOR EVERY 12 MANGOES, COUNT AS 8". Due to overnight demand, 'A' took his mangoes back from 'B' saying "FOR EVERY 8 MANGOES, COUNT AS 12". Find the profit or loss percent of 'A'.

55.5% loss

1.8000000000

0.4444444444

0.5555555556

$$\frac{8}{12} \times \frac{12}{8} = \frac{4}{9}$$

$$\frac{4}{9} = 2.25$$

$$= 0.4$$

$$= 0.5$$



Note:

A trader may sometimes have multiple profits or losses simultaneously.

This is equivalent to having multiple changes and so all individual changes are to be multiplied to get the overall effect.



Q. Sunidhi bought 15 apples for Rs.10 and sold them at the rate of 12 apples for Rs.12. What is the percentage of profit made by her?



A. 100%



B. 150%



C. 125%



D. None of these

$$\frac{S.P}{C.P} = 1 \div \frac{10}{15}$$

$$= 1 \times \frac{15}{10}$$

$$= 1.5$$

$$\underline{\underline{50\%P}}$$

$$S.P = \frac{12}{12} = 1$$

$$C.P = \frac{10}{15}$$

$$.5 \rightarrow$$



Q.

A shopkeeper advertises for selling cloth at 4% loss. However by using a false meter scale he actually gains 25%. What is actual length of scale?

A.

76.8 cm

B.

77.8 cm

C.

74.8 cm

D.

75.8 cm

$$\frac{SP}{C.P} = 0.96 \times \frac{100 \text{ cm}}{x \text{ cm}} = 1.25$$

$$\Rightarrow \frac{96}{x} = 1.25$$

$$\Rightarrow \frac{96}{1.25} = x = \frac{9600}{125} = \underline{76.8 \text{ cm}}$$



Q. A man sells an article at a profit of 20%. If he had bought it at 10% less and sold it for Rs. 18 more, he would have gained 40%. Find the cost price of the article.

$$1.2C.P + 18 = 1.26C.P$$

$$0.06C.P = 18$$

$$C.P = \frac{18}{0.06}$$

$$C.P = 300$$

$$\frac{S.P}{C.P} = 1.2 \Rightarrow S.P = 1.2C.P \text{ --- (1)}$$

$$\frac{S.P + 18}{0.9C.P} = 1.4 \text{ --- (2)}$$



✓✓

Tomorrow's session





Q. A trader marks his goods 12.5% above the cost price. His spring balance shows 950 grams for every kilogram. If he gives a discount of 12.5%, then what would be his gain or loss percent?

Assignment



A. 3.61% profit



B. 14.28% profit



C. 14.28% loss



D. 10.67% profit



Q.

An article was sold at a profit of 20%. If both cost price and selling price are Rs.100 less each, then magnitude of the percentage of profit would have been 4 percentage points more than that in the first case. Then the cost price is

A. ₹500

B. ₹600

C. ₹800

D. None of these

Assignment



Q.

5kg of ghee was bought by Venu for Rs.300. One kg from spoilt. He sells the remaining in such a way that on the whole he incurs a loss of 10%. At what price per kg does he sell the ghee?

Assignment



A. ₹46.25



B. ₹45.70



C. ₹67.50



D. ₹46.60

