

GATE



ALL BRANCHES

GENERAL APTITUDE

Quantitative Aptitude



Lecture No: 04

By-Amulya Ratan Sir



TOPICS TO BE COVERED



Understanding concept of Discount



Daily Life Puzzles



Equations to Mixtures Alligations



Questionnaire on the Topic



Discounts:



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

Marked Price

Percentage



Q. By giving a discount of 25%, a shopkeeper gains 25%. If he gives a discount of 40%, find his gain or loss%.

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

No P No L

$$S.P. = 75\% M.P.$$

$$S.P. = 125\% C.P.$$

$$75\% M.P. = 125\% C.P.$$

$$M.P. = \frac{5}{3} C.P.$$

$$\Rightarrow 60\% M.P. = \frac{60}{100} \times \frac{5}{3} C.P. \Rightarrow S.P. = C.P.$$

M.P.
Discount

25%

40%

C.P.
Profit

25%

?

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

$$S.P. = 1.25 C.P.$$

Q. By giving a discount of 25%, a shopkeeper gains 25%.
If he gives a discount of 40%, find his gain or loss%.

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

$$\frac{75}{C.P} = 1.25$$

$$\frac{75 \times 60}{1.25} = C.P$$

/

$$M.P. = ₹ 100$$

$$S.P = ₹ 75$$

$$C.P = ₹ 60 \text{ ✓}$$

$$S.P.N = ₹ 60 \text{ ✓}$$

No P No L

Q. A trader gains 20% by giving a discount of 20%, if he gives a discount of 25% then find his P% or L%.

$$S.P.N = 75$$

$$\frac{S.P.N}{C.P} = \frac{3}{2} \times \frac{3}{2} = \frac{9}{4} = 1.125$$

12.5% P

$$\frac{200}{3} = \frac{800}{12}$$

0.125

$$\frac{800}{12} = \frac{80}{1.2} = C.P$$

$$M.P. = 2100$$

$$S.P = 780$$

$$\frac{80}{C.P} = 1.2$$

Disc
vol.

25%

Profit
20%

?

$$80\% M.P = 120\% C.P$$

$$M.P = \frac{3}{2} C.P$$

$$\frac{S.P.N}{C.P} = \frac{9}{8} = 1.125$$



Q.

A trader marks his goods 12.5% above the cost price. His spring balance shows ^{1 kg} 950 grams for every ^{950g} kilogram. If he gives a discount of 12.5%, then what would be his gain or loss percent?

Assignment

$$\frac{S.P.}{C.P.} = 0.9843 \times \frac{1000}{950}$$

$$M.P. = 1.125 C.P.$$

$$S.P. = 0.875 M.P.$$

$$= 1.0361$$



A. 3.61% profit



B. 14.28% profit

$$\frac{3.61}{100} \times C.P.$$

$$S.P. = 0.875 \times 1.125 \times C.P.$$

$$\frac{S.P.}{C.P.} = 0.9843 \times \frac{950}{1000}$$

$$= 0.9351$$



C. 14.28% loss

$$\frac{S.P.}{C.P.} = 0.98437$$



D. 10.67% profit

$$= 0.0648 \times 100 = 6.48\% \text{ loss}$$



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

Assignment

A. ₹500

B. ₹600

C. ₹800

D. None of these

$$\frac{S.P}{C.P} = 1.2$$

$$S.P = 1.2 C.P$$

$$\frac{S.P - 100}{C.P - 100} = 1.24$$

$$\Rightarrow 1.2 C.P - 100 = 1.24 C.P - 124$$

$$\Rightarrow 0.04 C.P = 24$$

$$C.P = \frac{24}{0.04}$$

$$\frac{24}{0.04} = 2400$$

$$\frac{2400}{4} = 600$$



Q.

that

5kg of ghee was bought by Venu for Rs.300. One kg from
spoil. 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

$$\frac{S.P}{C.P} = \frac{4}{5} \times \frac{x}{60} = 0.9$$



B. ₹45.70

$$4x = 0.9 \times 300$$

$$4x = 270$$



D. ₹46.60

$$x = \frac{270}{4} = 67.5$$



C. ₹67.50



Puzzle:

A function hall was filled with 100 guests including men, women and kids. 100 biscuits has to be distributed among these guests, such that each man gets 4 biscuits, each woman as 3 and each kid gets $\frac{1}{2}$ biscuits. How many men, women and kids are there in function hall?

$$\begin{aligned} M &\rightarrow 4 \\ W &\rightarrow 3 \\ K &\rightarrow \frac{1}{2} \end{aligned}$$

$$\begin{aligned} M &\rightarrow ? \\ W &\rightarrow ? \\ K &\rightarrow ? \end{aligned}$$



0/5

Solution

$$7 \times ? = 5/0 \checkmark$$

$$M + W + K = 100$$

$$7M + 5W = 100$$

$$(4M + 3W + \frac{1}{2}K = 100) \times 2$$

$$8M + 6W + K = 200$$

$$M + W + K = 100$$

M - 10	40
W - 6	18
K - 84	42
<u>100</u>	<u>100</u>

$$7M + 5W = 100$$

M - 5	20
W - 13	39
K - 82	41
<u>100</u>	<u>100</u>

A - 40
B - 1
C - 0.2

280
280



A. 40

A - 40
B - 1
C - 0.2

C



TOTAL Money	:	280/-
TOTAL Number of Product	:	280



Solution



No. Cost

A - 4 ($\times 40$) 160

B - 81 81

C - 195×0.2 39

280

$$A + B + C = 280$$

$$40A + B + 0.2C = 280$$

$$40A + B + 0.2C = A + B + C$$

$$39A = 0.8C$$

$$\frac{A}{C} = \frac{0.8}{39} = \frac{8}{390} = \frac{4}{195}$$

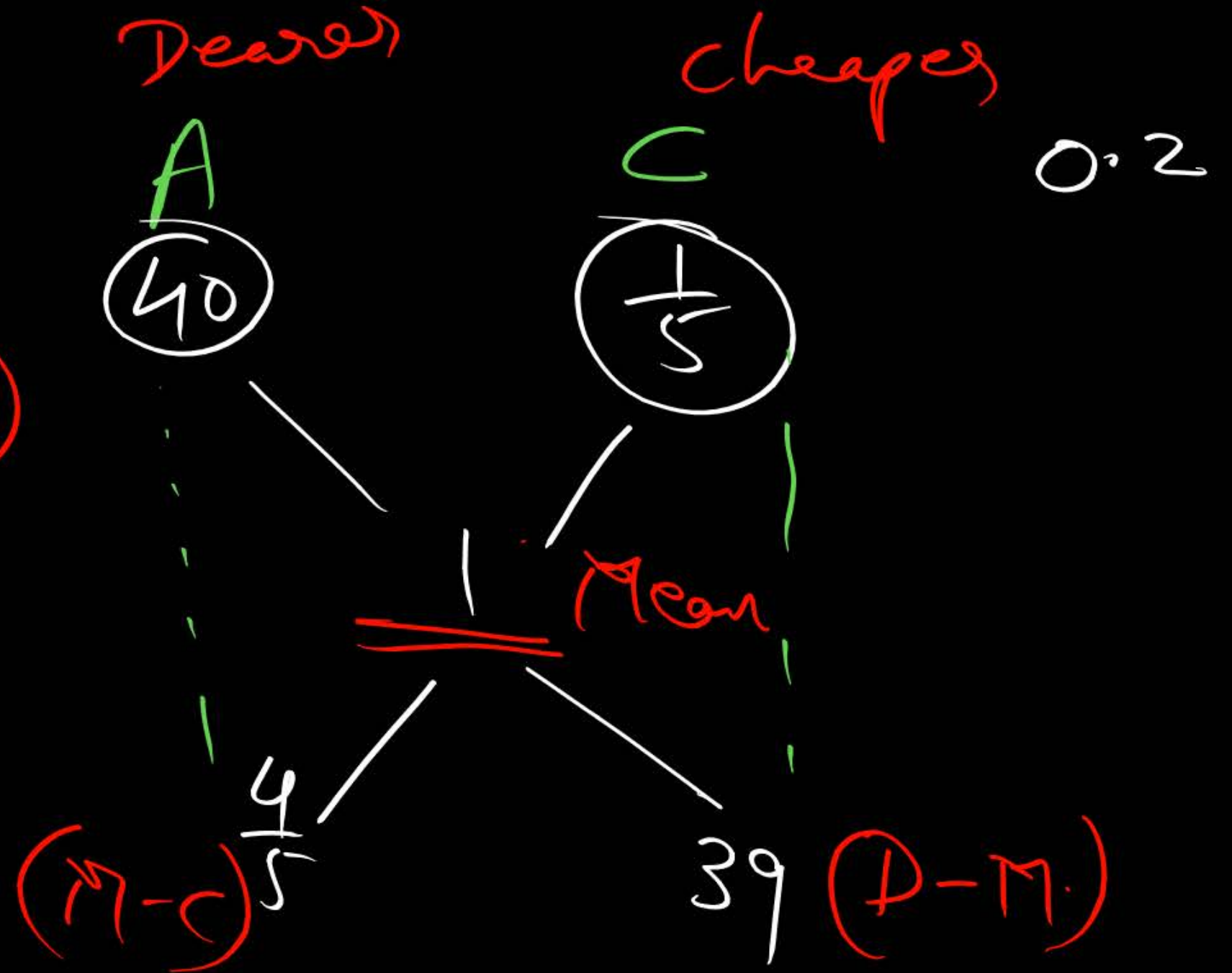


Mixtures Alligations



$$A:C = \frac{4}{5} : 39$$

$$= 4 : 195$$



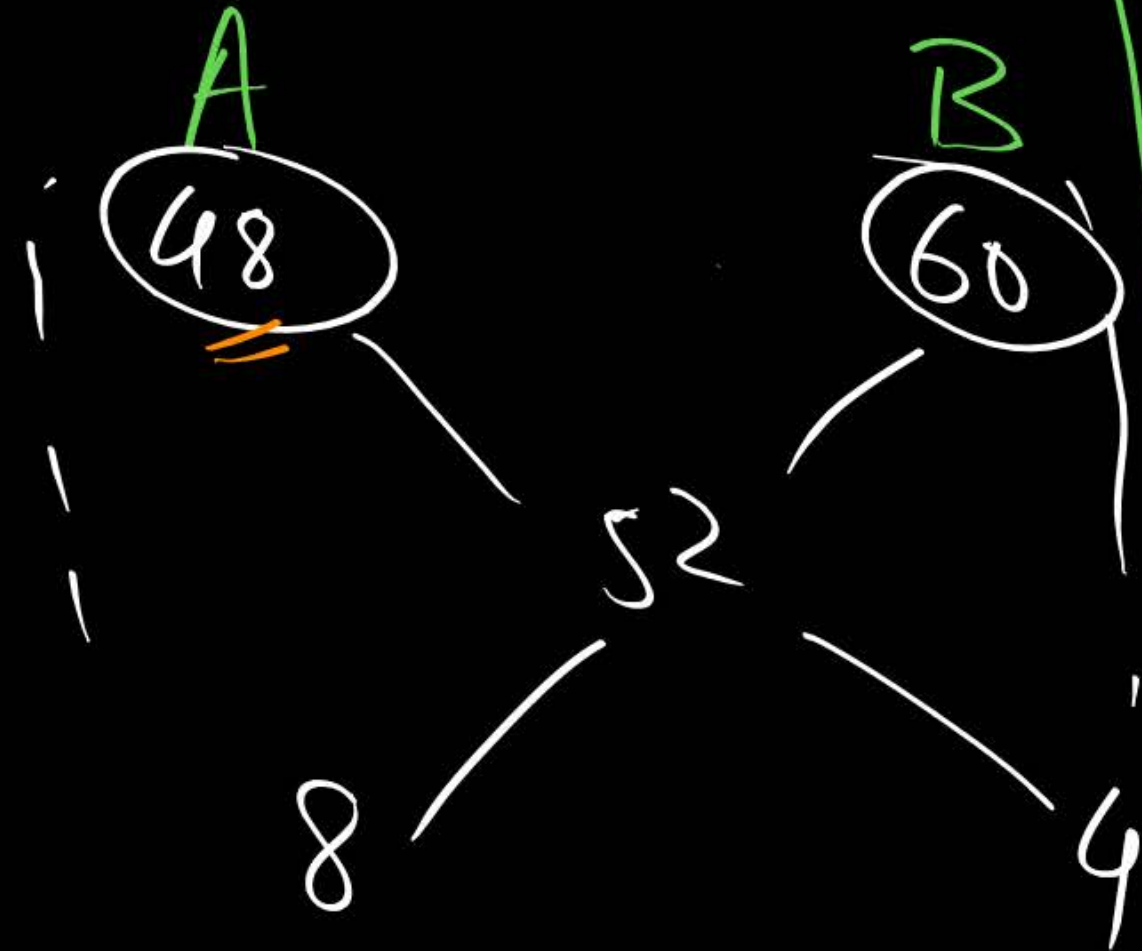


Q.

A trader purchases two varieties of rice 'A' & 'B' at the rate of ₹48/kg and ₹60/kg respectively. In what ratio he should mix the two varieties, so that the mixture cost becomes ₹52/kg?

$$A:B = 8:4$$

$$= 2:1$$



$$\begin{array}{r} 96 \\ 60 \\ \hline 156 \\ 52 \end{array}$$



Q.

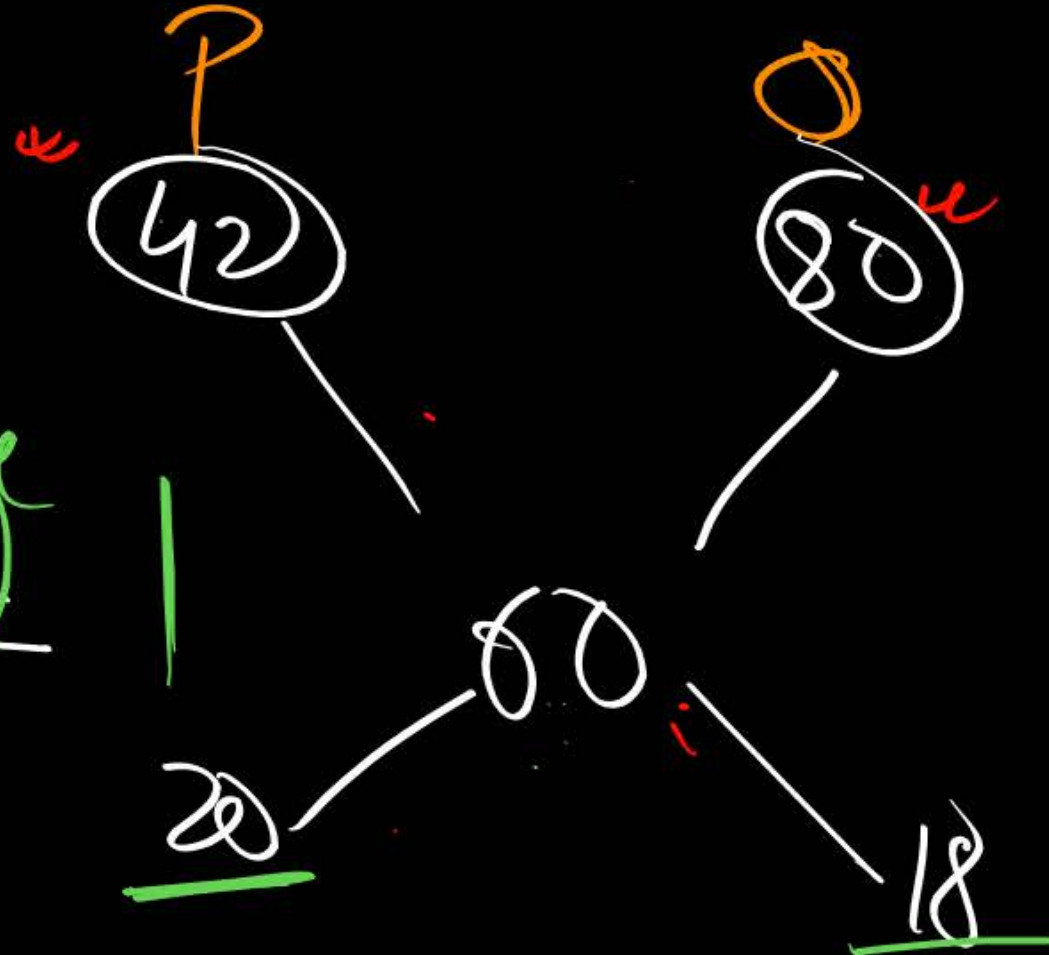
A trader purchases two varieties of Sugar 'P' & 'Q' at the rate of ₹42/kg and ₹80/kg respectively. In what ratio he should mix the two varieties, so that he can sell the mixture at ₹78/kg by getting 30% profit?

$$\frac{6}{780} \div \frac{1}{100} = 60$$

$$= 60$$

$$P:Q = 20:18$$

$$= 10:9$$



$$S.P. = 78$$

$$P = 30\%$$

$$\frac{78}{C.P.} = 1.3$$

$$\frac{78}{1.3} = C.P.$$



Q.

In a class with 360 students, the average age of all the boys is 24 years whereas average age of all the girls is 18 years. If average age of whole class is 20 years, then find the number of girls in that class.



A.

40



B.

300



C.

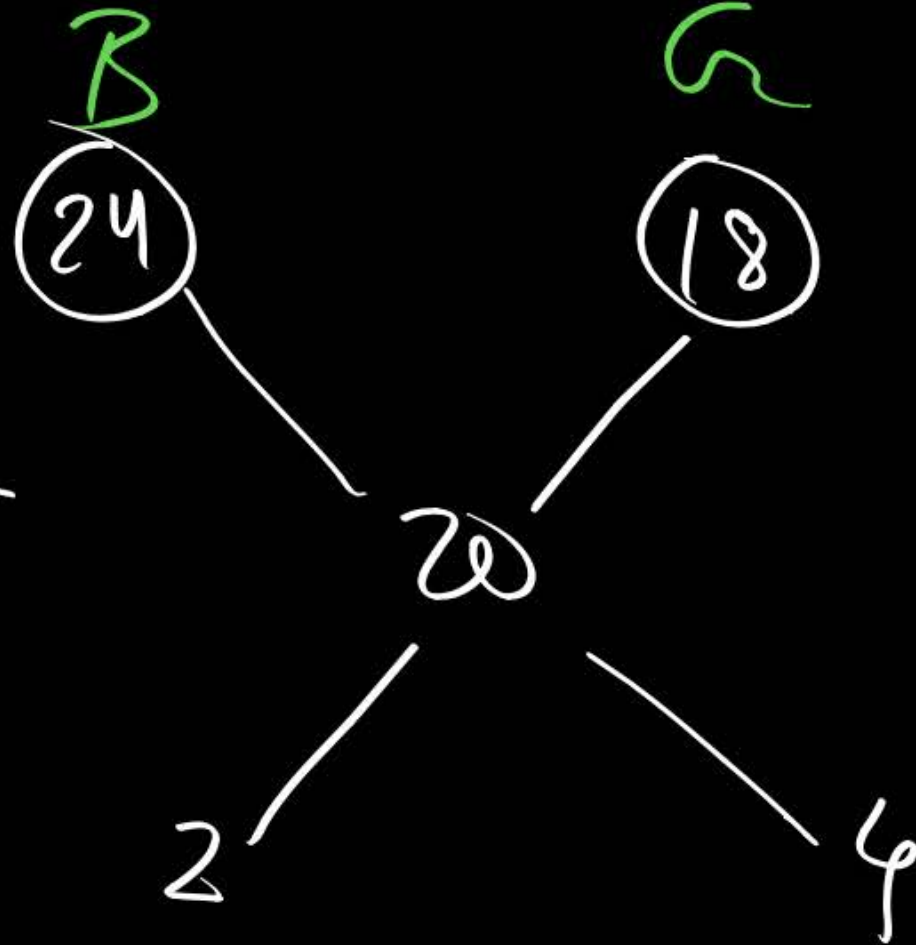
120



D.

240

$$B:G = 2:4 \\ = 1:2$$



$$G = \frac{2}{3} \times 360$$

$$= 240$$



Q.

A merchant sells 1600 sheep at an overall profit of 25%. Some of them he sold at 20% profit whereas remaining at 40% profit. Find the number of sheep he sold at 40% profit.

A. 400

B. 300

C. 1200

D. 1240

$$20\%P : 40\%P$$

$$= 15 : 5$$

$$= 3 : 1$$

20%

40%

25

15

5

$$\frac{1}{4} \times 1600$$

400

