Assignment-2

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Topic : profit & loss, percentage

(1) If an article is sold at a loss of 25%, and the selling price is 450 Rs. find the cost price

loss 25%

Selling price = 450 Rs

$$SP = \frac{CP(100 - \%\ loss)}{100}$$

$$450 = \frac{CP(100 - 25)}{100}$$

$$45000 = 100CP - 25CP$$

$$45000 = 75CP$$

$$CP = \frac{45000}{75}\ 600$$

$$CP = 600$$

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(2) A person bought an item for 1200rs and sold it for 1440rs what is the profit percentage.

cost price = 1200rs
sold price = 1440rs

$$\text{profit \%} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{1440 - 1200}{1200} \times 100$$

$$= \frac{240^{20}}{1200} \times 100$$

$$= 20\% \quad \text{Ans}$$

(3) If the selling price of an item is 960rs and the cost price is 800rs what is the profit percentage.

cost price = 800
selling price = 960

$$\text{profit percentage} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{960 - 800}{800} \times 100$$

$= \frac{960 - 800}{8}$

$= \frac{160}{8}$ 20

profit % = 20%

(4) A shopkeeper sells a fan at 1200rs with a loss of 20%. find the cost price?

Selling price = 1200rs

loss = 20%

$SP = \frac{CP(100 - \%\ loss)}{100}$

$1200 = \frac{CP(100 - 20)}{100}$

$120000 = 100CP - 20CP$

$120000 = 80CP$

$CP = \frac{12000}{80}$ 1500

$CP = 1500$ Ans

(5) If the ~~profit~~ cost price of an article is 400rs and it is sold for 480rs. What is the profit percentage.

CP = 400rs
SP = 480rs

$$\text{profit \%} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{480 - 400}{400} \times 100$$

$$= \frac{80}{400} \times 100$$

$$= 20\text{rs}$$ Ans

(6) A trader gives two successive discounts of 20% and 10% find the net discount percentage?

$$\text{net \% change} = a + b + \frac{ab}{100}$$

$$= 20 + 10 - \frac{20 \times 10}{100}$$

$$= 30 - \frac{200}{100}$$

$$= 28$$ Ans

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(7) A man sold a shirt for 800rs after giving a 20% discount. find the marked price.

$SP = 800$

discount = 20%

$$SP = \frac{CP(100 - \text{discount})}{100}$$

$$800 = \frac{CP(100 - 20)}{100}$$

$$80000 = 100CP - 20CP$$

$$80000 = 80CP$$

$$80CP = 80000$$

$$CP = \frac{80000}{80}$$

$$\boxed{CP = 1000}$$ Ans

(8) A watch is sold for 1800 rs with a 25% profit. find the cost price

SP = 1800 rs
profit = 25%

$$SP = \frac{CP(100 + \%\ profit)}{100}$$

$$1800 = \frac{CP(100 + 25)}{100}$$

$$180000 = 100CP + 25CP$$

$$180000 = 125CP$$

$$CP = \frac{180000}{125} \qquad 1100 = 125CP$$

$$180000 = 100CP + 25CP$$

$$180000 = 125CP \qquad CP = \frac{180000}{125} \qquad CP = 1440$$

(9) A shopkeeper marks an article at 1500 rs and allowes a 10% discount. find the selling price

CP = 1500 rs
discount = 10%

$$SP = \frac{CP(100 - \%\ loss)}{100}$$

$$SP = \frac{1500(100 - 10)}{100}$$

$$SP = \frac{1500 \times 90}{100}$$

$$\boxed{SP = 135} \quad \text{Ans}$$

(Q.) A merchant buys 10 pen for 150 and sells them for 200. What is his profit percentage?

$$CP = 150 \qquad SP = 200$$

$$\text{profit} = SP - CP$$
$$= 200 - 150$$
$$= 50$$

$$\text{profit \%} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{50}{150} \times 100$$

$$= \frac{500}{15} \quad \Big| = 33.33\% \text{ Ans}$$

(11) markup % = profit % + Discount %

$$\frac{}{1 - \frac{\text{discount \%}}{100}}$$

$$= \frac{20\% + 15\%}{1 - \frac{15}{100}}$$

$$= \frac{35}{\frac{100 - 15}{100}}$$

$$= \frac{35}{\frac{85}{100}}$$

$$= \frac{35}{85} \times \frac{100}{}$$

$$= \frac{3500}{85} \; 35$$

$$= \boxed{35\%}$$

(12) SP = 2250 rs

profit = 10%

$$SP = \frac{CP(100 + \text{Profit \%})}{100}$$

$$2250 = \frac{CP(100+10)}{100}$$

$$225000 = 100CP + 10CP$$

$$225000 = 110\,CP$$

$$CP = \frac{225000}{110} = 2045$$

$CP = 2045$ approx

$$\boxed{CP = 2000}$$ Ans

(13) ~~profit %~~ = 25%.
~~cost price~~ = 800

$$SP = \frac{CP(100 + \text{profit}\%)}{100}$$

$$SP = \frac{CP(100+25)}{100}$$

$$SP = \frac{125\,CP}{100}$$

(13) profit % = 25 %
cost price = 800 rs

$$SP = \frac{CP(100 + \text{profit \%})}{100}$$

$$SP = \frac{800(100+25)}{100}$$

$$SP = \frac{800(125)}{100}$$

$$SP = \frac{800 \times 125}{100}$$

$$\boxed{SP = 1000 \text{ Rs}}$$

(14) SP = 15,000
loss % = 10 %

$$SP = \frac{CP(100 - \text{\% loss})}{100}$$

$$15000 = \frac{CP(100-10)}{100}$$

$$15000 \times 100 = 90CP$$

$$1500000 = 90CP$$

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$$CP = \frac{1500000}{96} = 16.666$$

$$\boxed{CP = 16.666} \quad \text{Ans}$$

(15)

$$MP = CP + 50\% \text{ of } CP$$

Assum CP = 100 $= 100 + 50$

$= 150$

$$\text{Selling price} = MP - 20\% \text{ of } MP$$

$= 150 - 30$

$= 120$

$$\text{profit} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{120 - 100}{100} \times 100$$

$= 20\%$ Ans

(16)

$SP = 400 \times$

$SP = \frac{CP(100 + \text{profit \%})}{100}$

$SP = \frac{400(100+12)}{100}$

$SP = \frac{400 \times 112}{100}$

$SP = 448$

$SP = \frac{MP(100 - \text{loss \%})}{100}$

$448 = \frac{MP(100-5)}{100}$

$44800 = 95MP$

$MP = \frac{44800}{95}$ 471.5

$MP = 471.5$ Approx

$\boxed{MP = 500}$ Ans

(17) CP = 480
SP = 576

$$\text{profit \%} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{576 - 480}{480} \times 100$$

576
480
96

$$= \frac{960}{48} \quad 480^{20}$$

$$= 20\% \quad \text{Ans}$$

(18)

profit = 50 rs
CP = 500 rs

$$\text{profit \%} = \frac{SP - CP}{CP} \times 100$$

$$= \frac{50}{500} \times 100$$

$$= 10\% \quad \text{Ans}$$

(19) profit % = 15%

SP = 2300 rs

~~SP~~ ~~profit~~ % = $\frac{SP - CP}{CP} \times 100$

SP = ~~CP~~ $\frac{CP(100 + \% \text{ profit})}{100}$

$2300 = \frac{CP(100 + 15)}{100}$

$230000 = 115\,CP$

$CP = \frac{230000}{115}$ 2000

$\boxed{CP = 2000}$

(20) CP = 750 rs

SP = 900 rs

gain percentage = $\frac{SP - CP}{CP} \times 100$

$= \frac{900 - 750}{750} \times 100$

900
750
150

$= \frac{150}{750} \times 100$

$= \frac{1500}{75}\ 20$

$= 20\%$ Ans

(21) SP = 640

Loss % = 20 %

$SP = \frac{CP(100 - \%\ loss)}{100}$

$640 = \frac{CP(100-20)}{100}$

$640 = \frac{80CP}{100}$

$64000 = 80CP$

$CP = \frac{64000}{80}\ 800$

$\boxed{CP = 800}$ Ans

(22) SP = 9600 Rs
profit = 20%

$$SP = \frac{CP(100+20\%)}{100}$$

$$9600 = \frac{CP(100+20\%)}{100}$$

$$960000 = 120\,CP$$

$$CP = \frac{960000}{120}$$

$$\boxed{CP = 8000\ Rs}$$

(23) SP = 500
profit = 20%

$$SP = \frac{CP(100+\%\ profit)}{100}$$

$$500 = \frac{CP(100+20\%)}{100}$$

$$500 = \frac{120\,CP}{100}$$

$$50000 = 120\,CP$$

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$$CP = \frac{50000}{120} = 416.6$$

$CP = 416$ Approx

$\boxed{CP = 420}$ Ans

(Q4) $CP = 1500$

profit % = 20% of 1500

$= 0.20 \times 1500$

$= 300$

$SP = 1500 + 300$

$= 1800$

$CP = 1500$

loss % = 10% of 1500

$= 0.10 \times 1500$

$= 150$

$SP = 1500 - 150 = 1350$ Ans

Total cost price $= 1500 + 1500 = 3000$

total SP $= 1800 + 1350 = 3150$

Net profit = 3150 − 3000

= 150

profit = 5%

(25) SP = 1250

loss = 12%

$$SP = \frac{CP(100 - \%loss)}{100} \times 100$$

$$1250 = \frac{CP(100 - 12)}{100} \times 100$$

$$125000 = 88\,CP$$

$$CP = \frac{125000}{88} \quad 1420.45$$

$$\boxed{CP = 1420.45} \quad \text{Ans}$$

Approx

$$\boxed{CP = 1400}$$

(26) Assume cost price = 1 rs

total quantity = 2 units

total = 2 × 1
= 2 rs

selling price half for the quantity = 2 × 1 = 2

SP for the remaining half (1 unit) = 1 rs

Total selling price = 2 + 1 = 3

(27)

profit = SP - CP
= 3 - 2 = 1 rs

profit % = $\frac{1}{2} \times 100^{50}$

= 50 %

(27) $x \times \frac{20}{100}$

sum of the number & the result

$= x + 0.2x$

$= 1.2x$

(28) cost price $= x$

selling cost $= 50$

100% of the selling price $= \frac{50}{5} \times 100$

$= \frac{5000}{5}^{1000}$

$= 1000$

cost price $= 80\%$

100% of the cost price $= \frac{1000}{80} \times 100$

$= \frac{1250}{10000}$

$= 1250$

= cost price - loss

= 1250 - 1000

= 250

final loss = 250 + 50

= 300 Ans

(29) Assume cost price = 100

(1) cost price of 20% of goods is = 20

SP of 20% goods is 20 rs

= 20 × 150%

= $\frac{15}{100} \times 20$

= 30

(2) ~~Selling price of 40% goods is~~ 40 ~~× 80%~~.

~~cost price of 40% good is~~

CP of 20% goods 40

SP of 40% goods is Rs
$40 \times 80\% = 32$

cost price of 20% goods is Rs 20

Selling price of 20% goods is Rs. $20 \times 95\%$

$= \frac{95}{20} \times \frac{5}{100}$

$= 19$

selling price = 20

total selling price = $30 + 32 + 19 + 20$
$= 101$

profit percentage = $\frac{(101 - 100)}{100} \times 100$

$= 1\%$

(30) selling expense = 50 rupees

selling expenses are 10% more than the loss

$$50 = L + 0.1L$$

$$= 1.1L$$

$$L = \frac{50}{1.1}$$

$$= 45.45 \text{ rupees}$$

$$\text{loss \%} = \frac{L}{\text{cost price}} \times 100$$

$$= \frac{45.45}{6000} \times 100$$

$$= 7.5\%$$

(31) profit on 1 article

= cost price of 2 article

profit = 2C

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$$SP = CP + profit$$

$$= C + 2C$$

$$= 3C$$

$$profit\ \% = \frac{2C}{C} \times 100$$

$$= 200\%$$ Ans

(32) $cp_1 = 100$

profit % = 20 %

SP = ?

$cp = cp + \text{profit}$

$= 100 + 20$

$= 120$

actual cp = x

profit = 500

profit % = 20 % of cp

$cp = \frac{20}{100} \times = 500$

$cp = 2500$

$SP = 2500 + 500 = 3000$

new cp after reduction

$\frac{2500 - 20}{100} \times 1000$

$= 80\% \times 2500$

$= 0.8 \times 2500 = 2000$ ₹

New profit = selling price − New cp

= 3000 − 2000

= 1000 Ans

(33) ~~New cost price~~ cp = 100

profit % = 25 %

SP = cp + 25 % of

~~= 1.25 (~~ 100 + 25

= 125

~~cost price~~

New profit = 125 + 95

= 285

New profit % = $\frac{35}{90} \times 100$

= $\frac{350}{9}$ %

profit = 38.8 % Ans

(34) cp = 100

profit % = 500 %

SP = 100 + 500

= 600

cp is doubled = $2 \times 100 = 200$ rs

sp is halved = $\frac{600}{2} = 300$ rs

Now profit = $300 - 200 = 100$

new profit % = $\frac{100}{200} \times 100$

profit = 50%

(35)

Required decrease = $\frac{\text{increament price}}{100 + \text{increase price}} \times 100$

$= \frac{25}{125} \times 100$

$= \frac{2500}{125}$ %

Required decrease = 20%

(36)

cp (II) = 100

CP (II) = 1500

profit on selling 15 articles = cost price of 2 articles

Sol: SP = CP + profit = 200

= 1500 + 200

SP = 1700

profit % = $\frac{200}{1500} \times 100$

profit % = 13.33 %

(3c) 40 % of a number [A] is 50 % of a number [B] find a:b

40 % of a = 50 % of b

$\frac{40}{100} a = \frac{50}{100} b$

$\frac{2}{5} a = \frac{1}{2} b$

$4a = 5b$

a:b = 5:4

(37) discount $= x$

marked price $= 5x$

SP = Named price − discount

$= 5x - x$

$= 4x$

SP = 4 time the discount

(38) $x = 20\%$ of 12% of 120% of 6250

$x = \frac{20}{100} \times \frac{12}{100} \times \frac{120}{100} \times 6250$

$= \frac{1800000}{1000}$

$x = 180$

(39)

cp = 500

profit = 100%

sp = cp + profit

= 500 + 500

= 1000

marked price = x

discount = 35%

sp = mp - 35% of mp

$1000 = x - 0.35x$

$1000 = 0.65x$

$x = \frac{1000}{0.65}$

$x = 1538.46$

x ≈ 1539

(40)

A is 25% more than B

B = 100

A is 25% more than B

A = 100 + 25

A = 125

% B by which A is smaller

$$\frac{A-B}{A} \times 100$$

$$= \frac{125-100}{125} \times 100$$

$$= \frac{25}{125} \times 100$$

$$= \frac{2500}{125}^{20}$$

$$\boxed{\text{diff} = 20\%}$$

(41) $CP = x$

discount $= 2 \times CP = 2x$

$MP = 10.000$

$SP = CP$

$SP = MP - \text{discount}$

$x = 10000 - 2x$

$3x = 10000$

$$\boxed{x = 3333.33}$$

(42) $CP < 30\% \cdot SP$

discount $= 40\%$ of SP

$MP = 12,600$

$CP = ?$

$MP = SP + \text{discount}$

$12,600 = x + 0.4x$

$x = \frac{12600}{1.40}$

$\boxed{x = 9000}$

$CP = 30\%$ less than SP

$CP = SP - 30\%$ of SP

$CP = 9000 - 2700$

$\boxed{CP = 6300}$

(43) 33.33% of a number is 20 more than 16.66% of the number

20% of the number

$\frac{1}{3}x = 20 + \frac{1}{6}x$

$2x = 120 + x$

$2x - x = 120$

$\boxed{x = 120}$

$\frac{120}{100} \times 120 = 144$

$\boxed{x = 144}$

(44) num of 20% of a number is 20 more than 20% of another no. 20

$\frac{20}{100} x = 20 + \frac{20}{100} \times 20$

$\frac{1}{5} x = 20 + 4$

$\frac{1}{5} x = 24$

$x = 24 \times 5$

$\boxed{x = 120}$

(45) Initial $= x$
first step $= 2x$
then triple $= 6x$

Second step $= 12x$
then triple $= 36x$

3rd step $= 72x$
then triple $= 46x$

% change $= \frac{46x - x}{x} \times 100$

$= \frac{45x}{x} \times 100$

$= 45 \times 100\%$.

$= 4500\%$.

% change $= 4500\%$.

(46) 234 be reduced to ~~note~~ make it 65% of itself

65% of 235

$\frac{65}{100} \times 235 = 152.1$

reduction = 234 - 152.1

reduction = 81.9

(47) 90% of 900 of 9000

of 9

$$\frac{9}{10} \times \frac{90}{100} \times \frac{9000}{10} \times 9$$

$$\frac{9}{1} \times \frac{9}{1} \times \frac{9}{1} \times 9$$

= 6561

(48) initial salary = 100 units

25 employee each, employee earns 4 unit

Total salary before = 100 unit

employee remaining = 25 - 13 = 12

total salary of remaining employee before remaining

12 × 4 = 48 unit

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Now salary increased by 24%.

$= 48 \times 1.24$

$= 59.52$ units

% change

$= \frac{59.52 - 100}{100} \times 100$

$= \frac{-40.48}{100} \times 100$

$\boxed{= -40.48}$

Hence expenses decreased by 40.48%.