

Q1-ans

The ratio of the rates of working of A and B is  $\frac{4}{5} : 1$  in  $\frac{3}{5} : 1 = 4:3$ .

Therefore, A's 1 day's work =  $(\frac{1}{12}) * (\frac{4}{7}) = \frac{1}{21}$ .

Hence, A alone can complete the work in 21 days.

Q2-ans

Let 1 man does m work in 1 hour, 1 woman does w work in 1 hour and 1 child does c work in 1 hour.

Then,  $1m + 3w + 4c = \frac{1}{96}$

$2m + 8c = \frac{1}{80}$

$2m + 3w = \frac{1}{120}$

Solving these equations, we get  $m = \frac{1}{96}$ ,  $w = \frac{2}{288}$  and  $c = \frac{1}{288}$ .

Therefore, 10 men and 5 women can finish the work in  $(96 * 288) / (10 * 1 + 5 * 2) = 36$  hours.

Q3-ans

Let's assume the original revenue collection is represented by R.

The sales of cinema tickets increase by  $57 \frac{1}{7}\%$ :

Increase in sales =  $(57 \frac{1}{7}/100) * R$

The price of tickets increases by  $16 \frac{2}{3}\%$ :

Increase in ticket price =  $(16 \frac{2}{3}/100) * R$

Now, let's calculate the new revenue collection:

New revenue collection = Original revenue collection + Increase in sales + Increase in ticket price

New revenue collection =  $R + (57 \frac{1}{7}/100) * R + (16 \frac{2}{3}/100) * R$

Simplifying the expression:

New revenue collection =  $R * (1 + 57 \frac{1}{7}/100 + 16 \frac{2}{3}/100)$

New revenue collection =  $R * (1 + 57/7 * 1/100 + 16/3 * 1/100)$

To find the percentage increase in revenue collection, we need to calculate the percentage difference between the new revenue collection and the original revenue collection:

Percentage increase in revenue collection =  $((\text{New revenue collection} - \text{Original revenue collection}) / \text{Original revenue collection}) * 100$

Substituting the values:

Percentage increase in revenue collection =  $((R * (1 + 57/7 * 1/100 + 16/3 * 1/100) - R) / R) * 100$

Percentage increase in revenue collection =  $((R * (1 + (57/7 + 16/3) * 1/100) - R) / R) * 100$

Percentage increase in revenue collection =  $((R * (1 + (813/21) * 1/100) - R) / R) * 100$

Simplifying the expression:

Percentage increase in revenue collection =  $((R * (1 + 813/2100) - R) / R) * 100$

Percentage increase in revenue collection =  $((R * (2913/2100) - R) / R) * 100$

Converting the fraction to a decimal:

Percentage increase in revenue collection =  $((R * 1.387142857 - R) / R) * 100$

Simplifying further:

Percentage increase in revenue collection =  $(0.387142857 * R / R) * 100$

Percentage increase in revenue collection =  $0.387142857 * 100$

Percentage increase in revenue collection = 38.7142857

Therefore, the percentage increase in revenue collection is approximately 38.71%.

Q4-ans

Let's calculate the total amount of food available in the garrison:

Total amount of food = 1600 soldiers \* 900 grams/soldier \* 60 days

Total amount of food = 86400000 grams

After 40 days, 400 soldiers left the camp, so we need to adjust the total amount of food accordingly:

Remaining soldiers = 1600 soldiers - 400 soldiers

Remaining soldiers = 1200 soldiers

Now, let's calculate the new amount of food required per day for the remaining soldiers:

New food consumption per day = 1200 soldiers \* 1000 grams/soldier

New food consumption per day = 1200000 grams

To find out how long the food will last for the remaining soldiers, we need to divide the total amount of food available by the new food consumption per day:

Number of days = Total amount of food / New food consumption per day

Number of days = 86400000 grams / 1200000 grams/day

Number of days = 72 days

Therefore, the food will last for the remaining soldiers for approximately 72 days.

Q5-ans

Let's assume the cost price of the bicycle is represented by CP.

According to the given information, the dealer sold the bicycle at a profit of 10%. This means the selling price (SP) is 110% of the cost price.

$$\begin{aligned}\text{Profit} &= \text{SP} - \text{CP} \\ 10\% \text{ of CP} &= \text{SP} - \text{CP} \\ \text{SP} &= \text{CP} + 0.1\text{CP} \\ \text{SP} &= 1.1\text{CP}\end{aligned}$$

Now, let's consider the second scenario where the dealer buys the bicycle at 10% less price and sells it at a price Rs. 60 more, resulting in a 25% gain.

If he buys the bicycle at 10% less price, the new cost price would be 90% of the original cost price:

$$\text{New CP} = 0.9\text{CP}$$

The selling price in this scenario is Rs. 60 more than the original selling price:

$$\begin{aligned}\text{New SP} &= \text{SP} + \text{Rs. } 60 \\ \text{New SP} &= 1.1\text{CP} + \text{Rs. } 60\end{aligned}$$

According to the given information, the dealer gains 25% in this scenario:

$$\begin{aligned}\text{Profit} &= \text{New SP} - \text{New CP} \\ 25\% \text{ of New CP} &= \text{New SP} - \text{New CP} \\ \text{New SP} &= 1.25 \text{ New CP}\end{aligned}$$

Substituting the values:

$$1.1\text{CP} + \text{Rs. } 60 = 1.25(0.9\text{CP})$$

Simplifying the equation:

$$\begin{aligned}1.1\text{CP} + \text{Rs. } 60 &= 1.125\text{CP} \\ \text{Rs. } 60 &= 1.125\text{CP} - 1.1\text{CP} \\ \text{Rs. } 60 &= 0.025\text{CP} \\ \text{CP} &= \text{Rs. } 60 / 0.025 \\ \text{CP} &= \text{Rs. } 2400\end{aligned}$$

Therefore, the cost price of the bicycle was Rs. 2400.