Aptitude Assignment 6

1. A does 4/5th of work in 3/5 of the time as compared to B. Together they finish the work in 12 days. In how many days A alone will complete the work?

Let's assume that A completes the work in "x" days.

Given that A does 4/5th of the work in 3/5th of the time compared to B, we can set up the following equation based on the work done per day.

A's work per day = (4/5) / (3/5) = 4/3

Now, let's calculate B's work per day. Since A completes the work in "x" days, B completes the work in 12 days. So:

B's work per day = 1 / 12

Now, we know that the combined work per day when A and B work together is 1, as they complete the work in 12 days. Thus:

A's work per day + B's work per day = 1

4/3 + 1/12 = 1

To solve this equation, we need to find a common denominator:

(16/12) + (1/12) = 1

Combining the fractions:

17/12 = 1

To isolate A's work per day, we subtract B's work per day from both sides:

A's work per day = 1 - 1/12

A's work per day = 12/12 - 1/12

A's work per day = 11/12

Since A completes 11/12 of the work per day, we can calculate the number of days A alone will take to complete the work:

11/12 of work * x days = 1 (the complete work)

Simplifying the equation:

11x/12 = 1

To solve for x, we multiply both sides by 12/11:

x = 12/11

Therefore, A alone will complete the work in approximately 1.09 days (or 1 day and 2 hours).

2. 1 men , 3 women and 4 children finish work in 96 hour while 2 men and 8 children finish the work in 80 hours, and 2 men and 3 women finish the same work in 120 hours. Find the time in which the work can be completed by 10 men and 5 women?

To find the time it takes for 10 men and 5 women to complete the work, we can calculate their combined work rate and then use that to determine the time required.

Let's assume the work rate of 1 man per hour is "m," and the work rate of 1 woman per hour is "w."

From the given information:

1 man + 3 women + 4 children complete the work in 96 hours.

This can be expressed as: $1m + 3w + 4c = 1/96$ (work done per hour) -- (Equation 1)

2 men + 8 children complete the work in 80 hours.

This can be expressed as: $2m + 8c = 1/80$ -- (Equation 2)

2 men + 3 women complete the work in 120 hours.

This can be expressed as: $2m + 3w = 1/120$ -- (Equation 3)

Now, let's solve these equations to find the values of m and w.

From Equation 2, we can express the work rate of 1 child per hour, c, in terms of m:

$8c = 1/80 - 2m$

$c = (1/80 - 2m) / 8$

$c = (1 - 160m) / 640$

Substituting this value of c into Equation 1:

$1m + 3w + 4((1 - 160m) / 640) = 1/96$

Simplifying the equation:

$640m + 1920w + 4 - 640m = 1/96$

$1920w + 4 = 1/96$

$1920w = 1/96 - 4$

$1920w = -383/96$

$w = (-383/96) / 1920$

$w = -383/184320$

$w = -1/480$

Now, we have the work rate of 1 woman per hour, w. We can use this value in Equation 3 to find the work rate of 1 man per hour, m:

$2m + 3(-1/480) = 1/120$

$2m - 3/480 = 1/120$

$2m = 3/480 + 1/120$

$2m = 3/480 + 4/480$

$2m = 7/480$

$m = (7/480) / 2$, $m = 7/960$

Now, we know the work rate of 1 man per hour (m) and 1 woman per hour (w). Let's calculate the combined work rate of 10 men and 5 women: Combined work rate = (10 * m) + (5 * w)

$= (10 * 7/960) + (5 * -1/480)$

$= 7/96 - 1/96$

$= 6/96 = 1/16$

Now, to find the time required for 10 men and 5 women to complete the work, we can invert the combined work rate: Time required = 1 / Combined work rate

$= 1 / (1/16) = 16$

Therefore, the work can be completed by 10 men and 5 women in 16 hours.

3. The sales of a cinema ticket increase by 57 1/7 %, and the price of tickets also increases by 16 2/3%. Find the percentage increase in the revenue collection?

Let's assume the original number of tickets sold is represented by "x," and the original ticket price is represented by "y."

After a 57 1/7% increase, the new number of tickets sold will be:
x + (57 1/7)% of x
= x + (57 1/7/100) * x
= x + (400/7) * x/100
= x + (4/7) * x

Similarly, after a 16 2/3% increase, the new ticket price will be:
y + (16 2/3)% of y
= y + (16 2/3/100) * y
= y + (1/6) * y

The new revenue collection can be calculated by multiplying the new number of tickets sold and the new ticket price:
New revenue = (x + (4/7) * x) * (y + (1/6) * y)

The percentage increase in revenue collection can be calculated as:
Percentage increase = ((New revenue - Original revenue) / Original revenue) * 100

Now, let's substitute the values and calculate the percentage increase in revenue collection.

Let's simplify the expression for the new revenue and calculate the percentage increase.

The new revenue can be calculated as:
New revenue = (x + (4/7) * x) * (y + (1/6) * y)
= (1 + 4/7) * (1 + 1/6) * x * y
= (11/7) * (7/6) * x * y
= (11/6) * x * y

The percentage increase in revenue collection can be calculated as:
Percentage increase = ((New revenue - Original revenue) / Original revenue) * 100
= ((11/6) * x * y - x * y) / (x * y) * 100
= ((11/6 - 1) * x * y) / (x * y) * 100
= (5/6) * 100
= 83.33%

Therefore, the percentage increase in revenue collection is approximately 83.33%.

4. In a garrison, there was sufficient food for 1600 soldiers for 60 days. Each soldier consumes 900 grams of food every day. After 40 days, 400 soldiers left the camp. How long the food will last for the remaining soldiers if they consume 1000 grams of food every day.

Let's calculate the total amount of food available initially and then determine how long it will last for the remaining soldiers.

Initially, there is sufficient food for 1600 soldiers for 60 days. Each soldier consumes 900 grams of food per day.

Total food available initially = 1600 soldiers * 900 grams/soldier/day * 60 days
= 86,400,000 grams

After 40 days, 400 soldiers leave the camp. So, the remaining number of soldiers is 1600 - 400 = 1200 soldiers.

Now, we need to determine how long the food will last for the remaining soldiers if they consume 1000 grams of food per day.

Total food consumed per day by 1200 soldiers = 1200 soldiers * 1000 grams/soldier/day
= 1,200,000 grams/day

To find out how many days the remaining food will last, we divide the total available food by the daily consumption:

Number of days the remaining food will last = Total food available / Total food consumed per day

Number of days = 86,400,000 grams / 1,200,000 grams/day
= 72 days

Therefore, the remaining food will last for approximately 72 days for the remaining 1200 soldiers if they consume 1000 grams of food per day.

5. A dealer sold a bicycle at a profit of 10%. Had he bought the bicycle at 10% less price
and sold it at a price Rs. 60 more, he would have gained 25%. The cost price of the
bicycle was?

Let's assume the cost price (CP) of the bicycle is "x."

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

SP = 1.1 * x

If the dealer had bought the bicycle at 10% less price (0.9x) and sold it at a price Rs. 60 more, he would have gained 25%. This means the selling price in this scenario would be 125% of the cost price plus Rs. 60:

SP = 1.25 * x + 60

Since both equations represent the selling price (SP), we can equate them:

1.1 * x = 1.25 * x + 60

To solve this equation, we can subtract 1.1x from both sides:

0.15 * x = 60

Dividing both sides by 0.15, we get:

x = 60 / 0.15

Simplifying this, we find:

x = 400

Therefore, the cost price (CP) of the bicycle is Rs. 400.