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## GSA- 4<sup>th</sup> QUARTER

### Question #1:

A cylindrical tank with a radius of 5 meters and the height of 10 meters is filled with water.

If water is drained from the tank at a rate of 2 cubic meters per minute, how long will it take to empty the tank completely?

Sol:-

$$\text{Radius} = r = 5 \text{ meters}$$

$$\text{Height} = h = 10 \text{ meters}$$

$$\text{Rate} = 2 \text{ cubic meters per minute}$$

$$\text{time} = ?$$

→ To find the volume of cylinder,

$$V = \pi r^2 h$$

$$V = (3.14)(5)^2(10)$$

$$\underline{V = 785.25}$$

$$\begin{array}{r} \text{RHS} \\ 20 \\ \hline 785.25 \end{array}$$

→ Now, To find time:

$$t = \frac{V}{\text{rate of change}}$$

Date:    /    / 20

Day:           

$$t = \frac{785.25}{2}, \quad t \approx \underline{392.625}$$

• Hence 392.625 or 6.543 hours  
will required to empty the tanks.



### Question #2:

A farmer has 120 sheep  
and 80 cows. If the number <sup>of sheep</sup> is increased  
by 20% and number of ~~sheeps~~  
cows decreased by 10%. what is  
the ratio of sheep to cows?

Sol:-

$$\text{Sheeps} = 120$$

$$\text{Cows} = 80$$

$$\text{No. of sheep increased} = 20\%$$

$$\text{no. of cows decreased} = 10\%$$

$$\text{ratio of Sheeps to cow} = ?$$

→ First we find the new number of  
sheeps.

$$\begin{aligned} \text{Percentage increased} &= (\text{increased \%}) \times (\text{animal amount}) \\ &= (20\%) (120) \end{aligned}$$

$$= \left(\frac{20}{100}\right)(120), \quad (100)(120),$$

$$= 24$$

new number of sheep = original + increased no.

$$= 120 + 24$$

$$= \underline{144} \text{ sheep}$$

2 → To calculate the new number of cows.

decreased by 10%.

$$= (10\%)(80)$$

$$= \left(\frac{10}{100}\right)(80), \quad = 8 \text{ cows decreased}$$

new no. of cows = original no. - new no.

$$= 80 - 8$$

$$= \underline{72} \text{ cows.}$$

2 → Ratio of sheep to cows.

new no. of sheep : new no. of cows

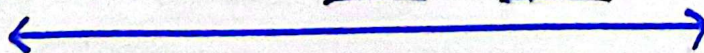
$$144 : 72$$

Dividing both sides by 72

$$\underline{2} : 1$$

→ Hence the new ratio of sheep

to cow is 2:1. Ans.



Question # 3:-

A store sells three types of coffee beans: A, B, C. Bean A costs Rs 100 per kg, B costs Rs. 150/kg, and C costs 200 per kg. The store mixes 2kg of A, 3 kg of B, and 1 kg of C to create a blend. What is the average cost per kg of this blend.

Sol:-

$$A = 100 \text{ per kg}$$

$$B = 150 \text{ per kg}$$

$$C = 200 \text{ per kg}$$

$$\rightarrow \text{Blend} = 2 \text{ kg A} + 3 \text{ kg B} + 1 \text{ kg C.}$$

$$= 2A + 3B + 1C$$

$$= 2(100) + 3(150) + 1(200)$$

$$\text{Total cost} = 200 + 450 + 200$$

$$= \underline{850}$$

$$\text{Total weight} = 2 + 3 + 1$$

$$= \underline{6 \text{ kg}}$$

$$\underline{\text{Average price}} = \frac{\text{Total cost}}{\text{Total weight}}$$

$$= \frac{850}{6}$$

$$RS = \underline{141.66} \text{ per kg}$$

$$\begin{array}{r} \text{R.W} \\ 141.66 \\ 6 \overline{) 850} \\ \underline{846} \\ 40 \\ \underline{36} \\ 40 \\ \underline{36} \\ 4 \end{array}$$

Question # 4:

Identifying the pattern  
in following sequence: 1, 4, 9, 16, 25...

Sol

Sequence: 1, 4, 9, 16, 25...

Difference between numbers:

$$1 + \underline{3} = 4, \quad 4 + \underline{5} = 9, \quad 9 + \underline{7} = 16$$

$$16 + \underline{9} = 25.$$

The difference between them follows  
the sequence of odd numbers, so  
the next number will be:

$$25 + \underline{11} = \underline{36} \quad \text{and so on}$$

Hence: 1, 4, 9, 16, 25, 36 Ans.

←—————→

Question 5:-

A machine can produce 100  
widgets per hour. If machine runs  
8 hours a day, how many widgets  
can it produce in a week?

Sol

machine produces: 100 widgets in 1 hr

1 hour = 100 widgets

8 hours = 8 (100)

Date:    /    / 20

Day:           

8 hours a day = 800 widgets  
→ Machine can produce 800  
widgets a day.

To calculate the total widgets  
it can produce in a week:

1 week = 7 days.

1 day output = 800 widgets

7 day output = 7(800 widgets)  
= 5600 widgets

Hence, machine can produce

5600 widgets a week  
if it runs for 8 hours a day.

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