# CAT 2023 Answer Key Slot 2- QA

**Few Memory-Based Questions With CAT Answer Key And Solutions In QA**

The answers provided here are based on the questions shared by candidates who appeared for CAT 2023 slot 2 on November 26. Explore the memory-based questions for CAT slot 2 (section-wise) along with answers to estimate your CAT score.

**Q1.** One vessel has 40 litres of milk. Now, 4 litres of milk is replaced with water and 4 litres of mixture is replaced with water gain and this process is done repeatedly. Find the minimum number of such processes so that the concentration of milk becomes less than the concentration of water in the end.

**Ans:** Remaining milk = $x\left(1-\frac{y}{x}\right)^n$

ATQ,

$40\left(1-\frac{4}{40}\right)^n < 2040\left(\frac{9}{10}\right)^n < 20\left(\frac{9}{10}\right)^n < \frac{1}{2}(0.9)^n < 0.5$

When n = 3

$(0.9)^3 = 0.729$

When n= 4

$(0.9)^4 = 0.6561$

When n= 5

$(0.9)^5 = 0.59049 (0.9)^6 = 0.531441$

When n= 7

$(0.9)^7 = 0.4782969$

Then, 7 times of such processes so that the concentration of milk becomes less than the concentration of water in the end.

**Q2.** “X” bought a pair of glasses at Rs. 1000 and sold it to “Y” at 20% profit. “Y” sold it back to “X” at 20% loss. Now,”X” sold the same glasses to “Z” so that its total profit is Rs. 500. Find the percentage profit of “X” when he sold the glasses to “Z”.

**Ans:**

First time the cost price for X = Rs. 1000
Cost price for Y = 120% of 1000 = Rs. 1200
Second time cost price for X = 80% of 1200 = Rs. 960
First time profit of X when sold to Y= 1200 – 1000 = Rs. 200
Second time profit of X when sold to Z = 500 – 200 = Rs. 300
Profit percentage when X sold to Z = $\frac{300}{960} \times 100 = 31.25\%$

**Q3.** Let a,b,m,n are natural numbers, a and b are greater than 1. Also, a^m x b^n = 144^145. Find the greatest value of m-n.

**Ans:** $a^m + b^n = 144^{145}$

Taking log both sides,

$\log log\left(a^m + b^n\right) = \log log 144^{145}$ $\log log a^m \times \log log b^n = 145 \log log 144\ a \times \log log b = 145 \log log 1$

Comparing both side,

$ab = 12\ and\ mn = 1740 mn = 60 \times 29$

So, $m - n = 60 - 29 = 31$

**Q4.** There are two arithmetic progression - $a_1$, $a_2$, $a_3$ ….. And $b_1$, $b_2$,$b_3$ ….. And $a_5 = b_9$ and $a_{19} = b_{19}$ and $b_2 = 0$. Then find the value of $a_{11}$ ?

**Ans:** $a_5 = a_1 + (5 - 1) \times d$

$a_5 = a_1 + 4 \times d_1$..... I

$b_9 = b_1 + 8 \times d_2$..... II

And,

$b_2 = b_1 + d_2 = 0 d_2 = -b_1$

Now,

$b_9 = b_1 + 8 \times -b_1$

$b_9 = -7b_1$

Similarly,

$b_{19} = -17b_1$

$a_5 = b_9$

$a_1 + 4d_1 = -7b_1$..... III

Ans,

$a_{19} = a_1 + 18d_1\ a_1 + 18d_1 = -17b_1$ .....

.IV because $a_{19} = b_{19}$

IV –III,

$14d_1 = -10b_1$

$d_1 = -\frac{5b_1}{7}$

And, $a_1 = -7b_1 + \frac{20b_1}{7} = -\frac{29b_1}{7}$

Now,

$a_{11} = a_1 + 10d_1 a_{11} = -\frac{29b_1}{7} + 10 \times \left(-\frac{5b_1}{7}\right) a_{11} = -\frac{79b_1}{7}$

**Q5.** Find the number of numbers which are less than 50 and have exactly two factors other than 1 and itself.

**Ans:** $N = a^n b^m$, where $a$ and $b$ are the prime numbers.

If n= 2, and m=0 , then N has exactly two factors other than 1.

If n = 0 and m = 2, then N has exactly two factors other than 1.

So, N is only a perfect square of prime numbers.

The perfect square number less than 50 which is square of prime number are 4, 9, 25, 49
So, the correct answer is 4.

**Q6:** Two boats met at a point and one of them moves towards West while one towards South. After 2 hours, the distance between them is 60 km. Find the speed of the slower boat if the difference in two speeds is 6 kmph.

**Ans: 18**

**Q7**: The ratio of two sides of the polygon is 1:2 and ratio of their interior angle is 3:4. Find the number of sides of the polygon with more number of sides.

**Ans: 10**

**Q8:** There are 100 bacteria on day 1. On nth day, 1 out of every n bacteria produces 1 more bacteria. On which day, the total number of bacteria will be more than or equal to 1000?

**Ans: 19th day**

**Q9:** The average of 5 integers is 38 and all the numbers are between 0 and 50 (both inclusive). In these 5 numbers, a is the minimum. If exactly 3 of them are more than 32, find the difference between the minimum and the maximum value of a.

**Ans: 20**