# TOP 10
# MOST FREQUENTLY ASKED LOGICAL PUZZLES IN INTERVIEWS

**Q1.** There are 3 mislabelled jars, with apple and oranges in the first and second jar respectively. The third jar contains a mixture of apples and oranges. You can pick as many fruits as required to precisely label each jar. Determine the minimum number of fruits to be picked up in the process of labelling the jars.

**Sol.** A noticeable aspect in this puzzle is the fact that there's a circular misplacement, which implies if apple is wrongly labelled as Apple, Apple can't be labelled as Orange, i.e., it has to be labelled as A+O. We are acquainted with the fact that everything is wrongly placed, which means A+O jar contains either Apple or Orange (but not both). The candidate picks one fruit from A+O, and let's assume he gets an apple. He labels the jar as apple, however, jar labelled Apple can't have A+O. Thus, the third jar left in the process should be labelled A+O. Basically, picking only one fruit helps in correctly labelling the jars.

**Q2.** 10 coins are placed before you on a table, while you stay blindfolded. The candidate is permitted to touch the coins, however conditions to the puzzle dictates that he can't really determine which way up they are by feel. 5 coins are placed heads up, while the other 5 are kept tails up, without the interviewee knowing which ones which are. If you're allowed to flip the coins any number of times, how would you build two piles of coins each with the same number of heads up.

**Sol.** This problem can be solved by initially creating two piles of coin, with 5 randomly selected coins in each pile. Let's assume the first pile looks like H, H, H, H, T and the other pile can be imagined as T, T, T, T, H. The final bit in solving the puzzle involves flipping all coins in the second pile to finally obtain same number of heads.

**Q3.** There are 8 batteries, but only 4 of them work. You have to use them for a flashlight which needs only 2 working batteries. To guarantee that the flashlight is turned on, what is the minimum number of battery pairs you need to test?

**Sol.** To solve this problem, the first step involves naming the batteries, for instance, A, B, C, D, E, F, G, and H. In this problem, you can't compare 2 items directly. If a combination of two batteries fail to turn the light on, it means either one or both the batteries aren't working. The candidate has to approach the puzzle in a circular manner.

The batteries are put test consecutively in the order AB, BC, and AC. At most, one of the three batteries between A, B, And C is working, only if none of the pairs work. This also implies that at least three batteries between D, E, F, G, and H must be functional. DE combination is tried next. If they don't work, at least 2 out of F, G, and H must work. Similarly, try the combinations FG, GH, and FH to positively asset which batteries really work.

**Q4.** You pull out 2 balls, one after another, from a bag which has 20 blue and 13 red balls in total. If the balls are of similar colour, then the balls are replaced with a blue ball, however, if the balls are of different colours, then a red ball is used to replace them. Once the balls are taken out of the bag, they are not placed back in the bag, and thus the number of balls keep reducing. Determine the colour of last ball left in the bag.

**Sol.** If the candidate pulls out 2 red balls, he replaces them with a blue ball. On the other hand, if he draws one red and one blue, it is replaced with a red one. This implies that the red ball would always be in odd numbers, whether the candidate removes 2 together, or removes 1 while adding 1. This also indicates that the last ball to stay in the bag would be a red one.

**Q5.** Two trains, separated by a distance of 80km, are running towards each other on the same track at a speed of 40kmph. A bird takes its flight from train X and flies towards train Y at a constant speed of 100kmph. Once it reaches train Y, it turns and start flying back toward strain X. The bird keeps flying to and forth till both the trains collide. Determine the distance travelled by the bird.

**Sol.** The problem can be solved mathematically in the following few steps:

Velocity of approach for two trains = (40+40) km/hr

Time taken for the trains to collide = 80km/80km/hr = 1hour

The total distance travelled by the bird = 100km/hr * 1hr = 100km

**Q6.** There are 3 switches in a room, where one of them is assigned for a bulb in the next room. You can't see whether the bulb is on or off, until you leave the room. Find the minimum number of times you have to go into the room to identify which switch corresponds to the bulb in the other room.

**Sol.** The person needs to initially turn on the first switch and keep it on for 2-3 minutes. Next, turn off the first switch and turn on the second one. Rush to the other room as soon as you turn on the second switch.

If the bulb is glowing, the second switch corresponds to the light bulb; however, if the bulb doesn't glow, but touching it feels warm, the first switch is the one that turns the bulb on. If it's neither lit, nor warm, then the third switch is the desired switch. So, a person must go only once to the other room to find out the accurate switch.

**Q7.** There are 2 jugs with 4 litres and 5 litres of water respectively. The objective is to pour exactly 7 litres of water in a bucket. How can it be accomplished?

**Sol.** The approach here is to initially fill the 5L jug with water and empty the same into the 4L jug. The 5L jug will be left with 1L of water, which is poured into the bucket. Meanwhile, empty the 4L jug.

The above step is repeated, so that the bucket now is filled with 2L of water. Finally, fill the 5L jug with water and empty the same into the bucket. The bucket will now have 7L of water, as you add % L directly to the previously collected 2L of water in the bucket.

**Q8.** There are 5 lanes on a race track. One needs to find out the 3 fastest horses among total of 25. Find out the minimum number of races to be conducted in order to determine the fastest three.

**Sol.** The approach entails conducting 5 races where each race group would involve 5 horses. In the ensuing step, a sixth race is conducted between winners of first 5 races to determine the 3 fastest horses (marked A1, B1, A=and C1). The seventh race is conducted between horses B1, C1, second and third horse from the horse A1's group (A2, A3), second horse from horse B1's group (B2). The horses that finish 1st and 2nd in the seventh race, are actually the 2nd and the 3rd fastest horses among all horses.

**Q9.** A birthday cake has to be equally divided into 8 equal pieces in exactly 3 cuts. Determine the way to make this division possible.

**Sol.** The approach entails slicing the cake horizontally down the centre, followed by making another division vertically through the centre. The two divisions made across horizontal and vertical directions will give you 4 equal pieces of the cake.

In the final step, simply stack the 4 pieces one above the other, and then make the third division, splitting the stack into half. This gives you the 8 equal pieces of cake, along with answer to your puzzle.

**Q10.** There are 10 stacks of 10 coins each, where each coin weighs 10gms. However, one of the stacks is defective, and that stack contains coins which weigh 9gms. Determine the minimum number of weights needed to identify the defective stack.

**Sol.** To solve this problem, the trick lies in creating a weighted stack for measurement, which will enable the candidate to identify the defective stack in one measurement.

A coin is taken from the first stack, 2 from the second, 3 from the third, and so on. This will give a total of 55 coins in hand. If none of them are defective, they would weigh 550gms together. However, if stack 1 turns defective, the total weight would stand at 549gms; defect in stack 2 would result in a total weight of 548gms; and so on. Therefore, just one measurement can help the candidate identify the faulty stack.