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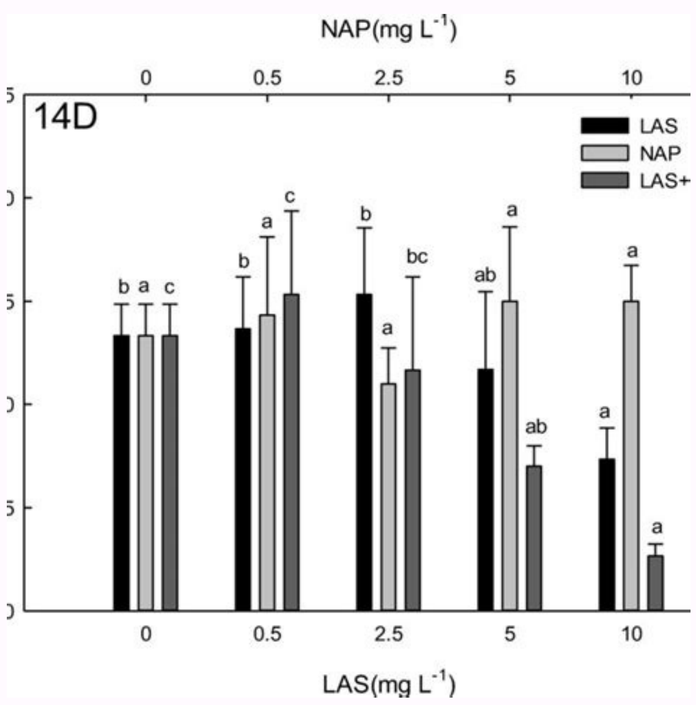
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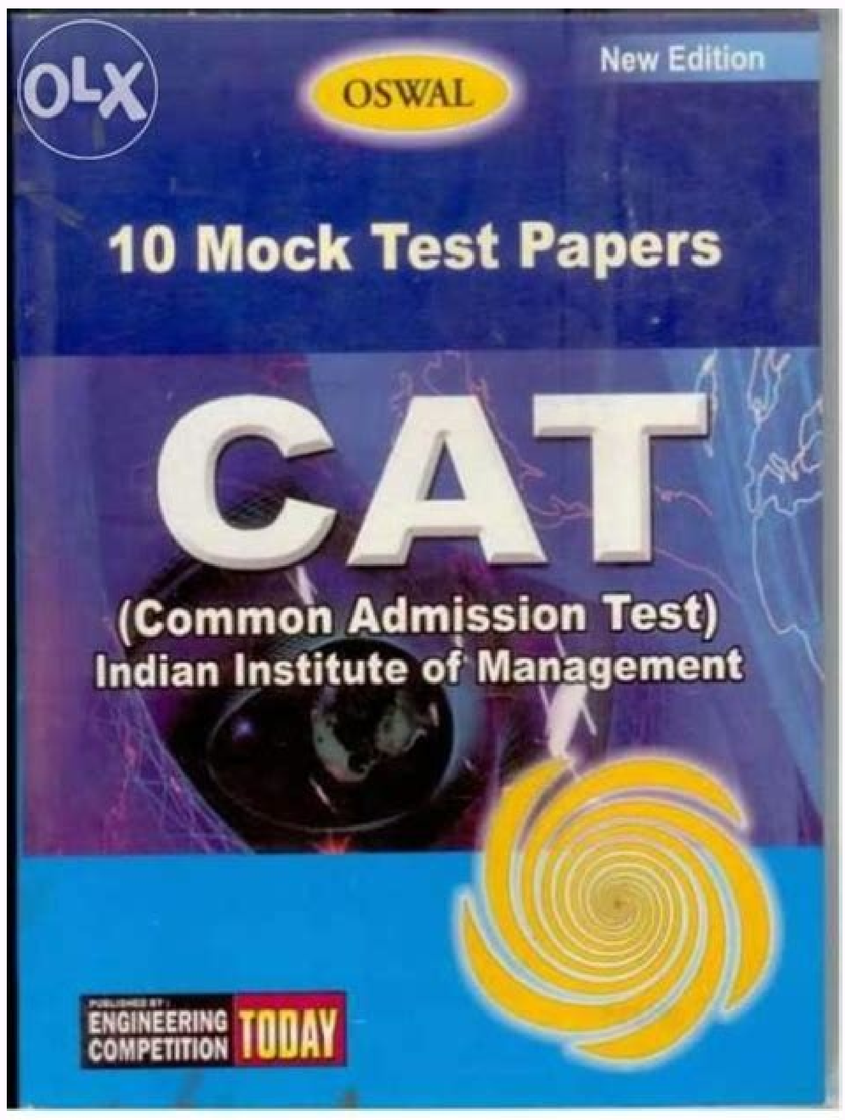
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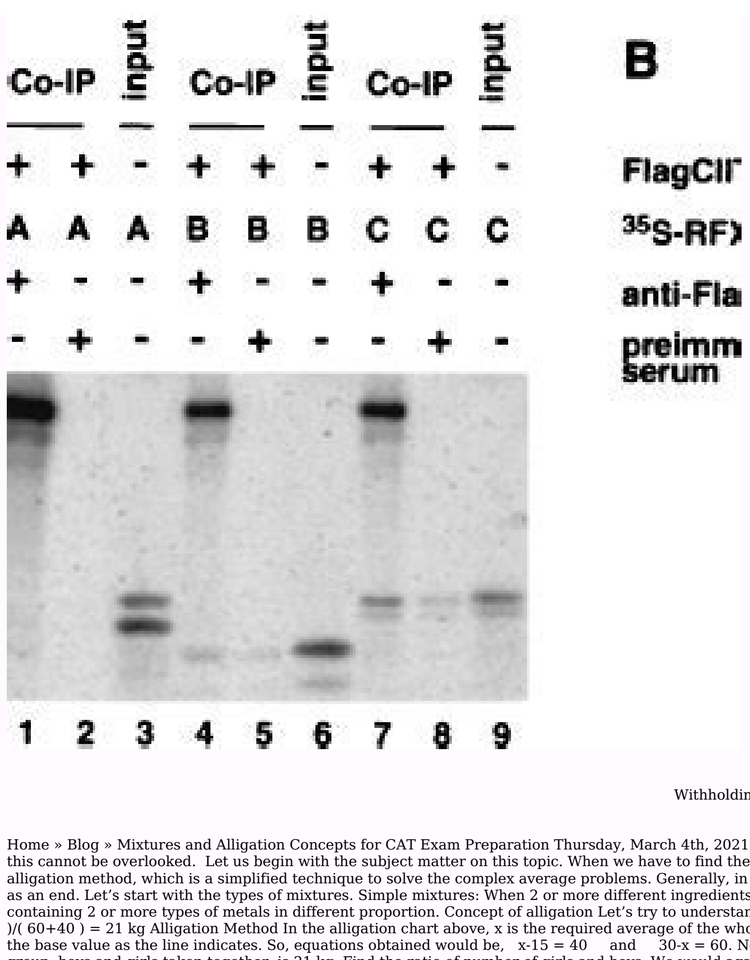

Withholding food from cat as punishment. Is whiskey bad for cats. Mixtures and alligations cat pdf. Mixtures and alligations cat questions. Can cats drink diluted milk.

Home » Blog » Mixtures and Alligation Concepts for CAT Exam Preparation Thursday, March 4th, 2021 The questions on Mixtures and Alligations are asked repeatedly in CAT and keeping the past year trends in mind, one or two questions are asked every year. We have seen the concept used in some of the Data Interpretation questions as well, so this cannot be overlooked. Let us begin with the subject matter on this topic. When we have to find the average of a given set of values, we just add those values and divide by the number of values in consideration. But what do we do when we have to find the average of 2 given sets of values, each containing different number of elements? We use alligation method, which is a simplified technique to solve the complex average problems. Generally, in competitive exams like CAT or XAT, the problems are not asked directly from these concepts, rather the techniques involved are applied for high difficulty level problems of CAT. So, consider the concepts of alligation & mixtures as a means and not as an end. Let's start with the types of mixtures. Simple mixtures: When 2 or more different ingredients are mixed together , a simple mixture is formed. Ex: mixing of milk and water, mixing rice of 2 different prices. Compound mixtures: When 2 or more different mixtures are mixed together, a compound mixture is formed. Ex: Mixing 2 alloys containing 2 or more types of metals in different proportion. Concept of alligation Let's try to understand it by examples. Ex-1. Average weight of 60 girls is 15 kg and average weight of 40 boys is 30 kg . Find the average weight of the group in which boys and girls are taken together. Weighted average method Average weight = (60×15 + 40×30)/(60+40) = 21 kg Alligation Method In the alligation chart above, x is the required average of the whole group. The individual average values have been written on the top, required average in the middle and the number of elements in both the groups at the base, correspondingly. Take the difference of the top and middle values and equate it with the base value as the line indicates. So, equations obtained would be, x-15 = 40 and 30-x = 60. Now, take the ratio of both equations. (x-15/30-x) = 40/60 Solving it would give x = 21 kg. Suppose the question was framed a bit differently, as below. Average weight of boys is 30kg and average weight of girls is 15kg. The average weight of whole group, boys and girls taken together, is 21 kg. Find the ratio of number of girls and boys. We would again apply the alligation method. Here a is the number of girls and b is the number of boys. (21-15)/(30-21) = b/a => a/b = 2/3. Now, we will see different formulae in mixture and alligations and their application. Application in normal mixtures (Quantity of expensive item)/(Quantity of cheaper item) =(Mean Price- Price of cheaper item)/ (Price of expensive item – Mean price) Average price of goods Ex-2. A shopkeeper mixes 30 kgs of sugar at Rs 20/kg and 45 kgs of sugar at 10/kg. What is the average price of the mixture? Sol: Let average price be x. x-10/20-x = 30/45 => x= Rs. 14/kg Average Speed Ex-3. A car travels at 20kmph for 30 minutes and at 10 kmph for 45 minutes. Find the average speed of the car for entire journey. (Note that we are using the same values as in the above example) Sol: x-10/ 20-x = 30/45 => x= 14 km/hr . NOTE– In the questions involving speed, we never use distance directly while applying alligation method. Only speed and time are used. Speeds are always written at the top, average speed in the middle and time at the base. Ex-4. Amit covers 200 km in 10 hours. The first part of journey is travelled by bus at the speed of 15 km/hr and second part by a car at the speed of 25 km/hr. What is the ratio of distances covered by bus and car? Sol: Average speed= 250/10 = 10 km/hr. Let time travelled by bus be 'a' and by car be 'b'. Applying alligation method (20-15)/(25-20) = b/a = 1:1 This means that both vehicles have travelled equal amount of time out of 10 hours i.e. 5 hours each. Distance travelled by bus = 15×5 = 75 and distance travelled by car = 25×5 = 125 . So, the ratio is 75/125 = 3/5 Profit/Loss Ex-5. A milkman has 30 litres of milk. He mixes 10 litres of water in that milk. What is his profit percentage, when he sells all the mixture at cost price. Assume the water is free of cost. Sol: Water, which is free of cost, is being sold at the cost of milk, then the water gives profit on the cost of 30 litres of milk. Profit% = (10/30)x 100 = 33.33% . Understand that all the milk in the mixture is being sold at its cost price, so profit from milk component is 0%, while water in the mixture is being sold at the cost of milk which is the source of profit. In questions like these, where a cost-free item is being added to a non-free item in the ratio of a/b, and the mixture is being sold at the cost of non-free item, the profit% = (a/b)x 100 Ex-6. In what ratio should water be mixed with the wine worth Rs. 60 per litre so that after selling the mixture at Rs.50 per litre, the profit will be 25%? Sol: Selling price= cost price x 1.25 => 50= cost price x 1.25 => C.P. of mixture = Rs. 40. Let amount of water be 'a' and wine be 'b' (40-0)/(60-40) = a/b = 1/2 Application in compound mixture 2 mixtures A and B contain components x and y in the ratio p/q and r/s respectively. In what ratios A and B should be mixed so that in the new mixture ratio of x and y is t/u. In questions involving such mixtures , select any particular component, say x, and find its proportion in each mixture, i.e. p/(p+q) and r/(r+s) . The required proportion is t / (t+u). Let the quantity of each mixture needed to be mixed be a and b. Then apply the alligation method by writing proportions on top, required proportion in the middle and corresponding quantities needed at the base. Solving it would give the required ratio a/b . Ex-7. Vessel A contains milk and water in the ratio 4:5. Vessel B contains milk and water in the proportion 5:1.In what proportion should quantities be taken from A & B to form a mixture in which milk and water are in the ratio 5:4? Sol: For this question, we will consider the proportion of milk in each mixture. In Vessel A, the proportion of milk is 4/(4+5) =4/9. In vessel B, the proportion of milk is 5/(5+1) = 5/6. The amount of milk in the final mixture= 5/(5+4) = 5/9 a = (5/6)-(5/9) = 5/18 b = (5/9)-(4/9) = 1/9 The ratio is (5/18):(1/9) = a/b = 5/2. Ex-8. Product P is produced by mixing chemical X and chemical Y in the ratio of 5 : 4. Chemical X is prepared by mixing two raw materials, A and B, in the ratio of 1 : 3. Chemical Y is prepared by mixing raw materials, B and C, in the ratio of 2 : 1. Then the final mixture is prepared by mixing 864 units of product P with water. If the concentration of the raw material B in the final mixture is 50%, how much water had been added to product P? Sol: First, we need to find the proportion of B in Product P. It can be easily found as its proportion in chemical X and Y is given and proportion of X and Y in P is also given. P is produced by mixing chemical X and chemical Y in the ratio 5 : 4. Hence, 5/9th of product P is chemical X and 4/9th of product P is chemical Y. Chemical X has A and B in the ratio 1 : 3. So, 3/4th of X is B. Therefore, proportion of B in product P from chemical X = 5/9×3/4 Chemical Y has B and C in the ratio 2 : 1. So, 2/3rd of Y is B. Therefore, proportion of B in product P from chemical Y = 4/9×2/3 Adding the two, the proportion of B in Product P = 5/9×3/4 + 4/9×2/3 = 77/108 The final mixture is obtained by mixing 864 units of product P with water. Proportion of B in final mixture= 1/2 = 54/108. Proportion of B in water is 0. Let units of water to be added be x. Applying alligation, x = 368 units. Replacing of part In cases where a certain amount of an item A is being drawn out and being replaced by another item B and this process is repeated n times then, Final or reduced amount of A = Initial amount of A x {1 – (amount being drawn out in each operation/total amount)}^n Let's see some examples. Ex-9. A container has 50 litres of milk in it. 5 litres of milk is taken out and is replaced by 5 litres of water. This process is repeated 4 more times. What is the amount of milk in the container after final replacement? Sol: Total amount=50 litres Amount being replaced each time= 5 litres n=5 Initial amount of milk= 50 litres. Therefore, Final amount of milk = 50 x (1-(5/50))^5 = 29.5 litres NOTE: Above formula is valid for pure items as well as mixtures. But in case of mixtures, the component into consideration must be that which is getting reduced after replacement. Ex-10. In a mixture of milk and water, there is only 75% milk. After replacing the mixture with 5 litres of water, percentage of milk in the mixture becomes 60%.. What is the total quantity of the mixture? Sol: Let total quantity of mixture be T. We will consider milk as it is getting reduced. Initial amount = 75% (if absolute values are not given, proportion/percentage can also be used) Final amount = 60% n=1. Then, 60 = 75 x (1 – 5/T) => T = 25 litres. Questions similar to above questions can also be solved using alligation. Let's take an example. Ex-11. Some part of a sugar solution which contains 40% sugar is replaced with another sugar solution which contains 19% sugar. Concentration of sugar in the new mixture became 26%. What fraction of the first sugar solution was replaced with second sugar solution? Sol: Applying alligation method, So, the second and first solutions are in the ratio 2:1 in the final mixture. Since volume of mixture is same as that of initial volume of first sugar solution, we can see that only 1/3 of first sugar solution is left in final mixture. This means 2/3 of it was replaced by second sugar solution. To sum up, this topic is one of the scoring areas though the weight age is not that big as compared to other topics but, we should focus on scoring easy marks first. I hope you have got a gist of the topic and you can start practicing questions on Alligations and Mixtures. Best of luck for your preparation. 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