

## **AVERAGE, MIXTURE & ALLIGATION**

(Ref: FM-QAH2022003)

#### Simple Average

- 1. The heights of five boys are as follows: 109 cm, 110 cm, 110 cm, 108 cm and 109 cm. What is the average height of these boys?
- 2. Six children have 30, 40, 50, 60, 70, and 80 books with them. If each of them is given 15 books additionally, what will be the average number of books with them?
- The mean temperature of Monday to Wednesday was 37 °C and of Tuesday to Thursday was 34°C. If the temperature on Thursday was 4/5 that of Monday, the temperature on Thursday was

   a) 38 °C
   b) 36 °C
   c) 40 °C
   d) 39 °C
- 4. The average age of Ram and Shyam is 20 years. Their average age 5 years hence will be

  a) 25 years
  b) 22 years
  c) 21 years
  d) 20 years
- 5. The average age of a family of 6 members is 22 years. If the age of the youngest member be 7years, what was the average age of the family at the birth of the youngest member?
  a) 15 b) 18 c) 21 d) 12
- 6. The age of Shaurya and Kauravki is in the ratio 2:6. After 5 years, the ratio of their ages will become 6:8. Find the average of their ages after 10 years.
  a) 12 b) 13 c) 17 d) 24
- 7. In hotel Jaysarmin, the rooms are numbered from 101 to 130 on the first floor, 221 to 260 on the second floor, and 306 to 345 on the third floor. In the month of June 2012, the room occupancy was 60% on the first floor, 40% on the second floor, and 75% on the third floor. If it is also known that the room charges are 200, 100, and 150 on each of the floors, then find the average income per room for the month of June 2019.
  a) 151.5 b) 88.18 c) 78.3 d) 65.7
- 8. A salesman gets a bonus according to the following structure: If he sells articles worth x then he gets a bonus of (x/100 1). In the month of January, the value of his sales was 100, in February it was 200, from March to November it was 300 for every month and in December it was 1200. Apart from this, he also receives a basic salary of 30 per month from his employer. Find his average income per month during the year.
  a) 31.25 b) 30.34 c) 32.5 d) 34.5

#### **Inclusion/Exclusion & Replacement**

9. The average age of 24 students and the principal is 15 years. When the principal's age is excluded, the average age decreases by 1 year. What is the age of the principal?
a) 38 b) 40 c) 39 d) 37

- 10. Rohit Sharma has a certain average for 9 innings. In the tenth inning, he scores 100 runs thereby increasing his average by 8 runs. His new average is
  - a) 20 b) 24 c) 28 d) 32
- 11. The average of 6 students is 11 years. If 2 more students of age 14 and 16 years join, their average will becomea) 12 yearsb) 13 years
  - c) 21 years d) 19 years
- 12. The average weight of 35 students is 35 kg. If the teacher is also included, the average weight increases to 36 kg. The weight of the teacher is
  a) 36 kg
  b) 71 kg
  c) 70 kg
  d) 45 kg
- 13. The average age of 8 persons in a committee is increased by 2 years when two men aged 35 years and 45 years are substituted by two women. Find the average age of the two women.
  a) 48 b) 45 c) 51 d) 42
- 14. The average weight of 19 men in a ship is increased by 3.5 kg when one of the men, who weighs 79 kg, is replaced by a new man. Find the weight of the new man up to 2 decimal placesa) 105.75 b) 107.55
  - a) 105.75 b) 107.55 c) 145.50 d) 140.50
- 15. The average weight of 5 men is decreased by 3 kg when one of them weighing 150 kg is replaced by another person. Find the weight of the new person.
  a) 165 kg
  b) 135 kg
  c) 138 kg
  d) 162 kg
- 16. Three years ago, the average age of *A*, *B* and *C* was 27 years and that of *B* and *C* 5 years ago was20 years. *A*'s present age is

  a) 30 years
  b) 35 years
  c) 40 years
  d) 48 years
- 17. A man had seven children. When their average age was 12 years a child aged 6 years died. The average age of the remaining 6 children is

  a) 6 years
  b) 13 years
  c) 17 years
  d) 15 years
- 18. The average weight of 3 men A, B and C is 84 kg. Another man D joins the group and the average now becomes 80 kg. If another man E, whose weight is 3 kg more than that of D, replaces A then the average weight of B, C, D, and E become 78 kg. The weight of A is
  a) 70 kg
  b) 72 kg
  c) 79 kg
  d) 78 kg

### Based on Numbers

19. The average of the first five multiples of 7 isa) 20b) 21c) 28d) 30



20. The ave	rage of 3 num	bers is 17 and th	at of the first
two is 1	6. Find the thire	d number.	
a) 15	b) 16	c) 17	d) 19

- 21. Find the average of the first 97 natural numbers.a) 47b) 37c) 48d) 49
- 22. Find the average of all prime numbers between 30 and 50.a) 39.8 b) 38.8 c) 37.8 d) 41.8
- 23. The average of the first ten natural numbers is a) 5 b) 5.5 c) 6.5 d) 6
- 24. The average of the first ten whole numbers is a) 4.5 b) 5 c) 5.5 d) 4
- 25. The average of the first ten even numbers is a) 18 b) 22 c) 9 d) 11
- 26. The average of the first ten odd numbers is a) 11 b) 10 c) 17 d) 9
- 27. The average of the first ten prime numbers is a) 15.5 b) 12.5 c) 10 d) 12.9
- 28. The average of the first ten composite numbers is a) 12.9 b) 11 c) 11.2 d) 10
- 29. The average of the first ten prime numbers, which are odd, is a) 12.9 b) 13.8 c) 17 d) 15.8
- 30. If the average of nine consecutive even natural numbers, the greatest of which is y, is x, find the average of 17 consecutive natural numbers, the least of which is x?
  a) y-2
  b) y
  c) y-1
  d) y+4

#### Weighted Average

- 31. There are five positive integers. When any four of these integers are considered and their average is added to the fifth integer, we get the following numbers: 41, 44, 50, 56 and 65. Which of the following gives the value of one of these five integers?a) 28 b) 44 c) 36 d) 18
- 32. In a college there are two streams Science and Commerce. Science has 150 students and commerce has 200 students. The students of both the stream took an LR test. The average marks of students of science and commerce are 45 marks and 59 marks respectively. What are the average marks of the whole college?
- 33. In a college there are two streams science and commerce. The average marks obtained by the students of both the streams in an LR test are in the ratio 3:4. If the number of students in both the streams are 150 and 200 respectively what are the average marks of the whole college?

34.

Company	Number of Employees	Average Age
Р	30	85
Q	45	75
R	60	80
S	90	90

	Four comp number of is as indica four compa	anies P, Q, R employees with ted above. Find anies combined	and S consist h respective ave the average age	of distinct erage age e of all the
	a) 83	b) 83.33	c) 83.66	d) 83.5
<u>Mi</u>	xture & A	<u>lligations</u>		
35.	A Mixture contain 70 sulphur, in a) 2:7	contain 88% of % of sulphur. what ratio these b) 7:2	sulphur, anothe In order to ge e two must be m c) 7:4	er mixture t 84% of ixed. d) 4:5
36.	A goldsmit carats and proportion of 8 carats	h has two qua l another of 5 should he mix b purity?	alities of gold, o carates purity both to make an	one of 10 In what ornament
	a) 3:2	b) 3:7	c) 5:9	d) 7:11
37.	In what rati costing Rs Rs.28.75?	o does grocer r .25 and Rs.30	nix two varieties per Kg to get a	of pulses mix worth
	a) 1:3	b) 4:9	c) 11:4	d) 4:5
38.	In what rati per liter to a) 2:3	o water be mixe obtain a mixture b) 2:1	ed with juice cost e worth of Rs.8 p c) 1:2	ing Rs.12 per liter? d) 3:2
39.	Box A cont contains w are mixed	ains wheat wor heat worth Rs.4 in the ratio 4:7	th Rs.30 per kg a 40 per kg. If both then the price o	and box B n A and B of mixture
	a) 36.36	b) 35.80	c) 42.50	d) 31.30
40.	A merchar sells at 10 gains 12% a) 833	nt has 2500 kg % profit and th overall. The qu b) 830	of rice, part of ne rest at 16% antity sold at 16 c) 830.33	which he Profit. He % profit is d) 833.33
41.	150 kg of v 10% profit. to be sold s price? a) Rs 9.75	wheat is at Rs At what rate p so that there is a b) Rs	7 per kg. 50 kg er kg the remain a profit of 20% o 8.25	is sold at ning need n the total
	c) Rs 8.75	d) Rs	10.25 e) Rs	10
42.	Sum of Rs. each girl Rs.1.80.Hc a) 26	.96 was shared receive Rs.2 ow much amour b) 27	among 48 boys 2.40 and boy nt did boys c) 32	and girls, receive d) 30
43.	How many mixed with selling the	kilograms of v 25 kg of wheat mixture at Rs 4	vheat at Rs 42   at Rs 24 per kg 0 per kg, there is	per kg be so that on a gain of

 selling the flixture at RS 40 per kg, there is a gain

 25%?

 a) 24 kg
 b) 20 kg

 c) 42 kg
 d) 36 kg
 e) 22 kg



- 44. In what proportion must water be mixed with milk to gain 40 % by selling it at cost price? a) 3:5 b) 5:3 d) 3:2 c) 2:5
- 45. A dairy man pays Rs.6.40 per liter of milk. He adds water and sells the mixture at Rs.8 per liter thereby making 37.5% profit. Find the ratio of the water to milk received by the customers?

a) 1:15 b) 1:20 c) 1:12 d) 1:10

- 46. In 600 gram of mixture of salt and water, there is 40 % water. How much water should be converted to steam so that water in the mixture remains 25 %. b) 120grams a) 90grams c) 170grams d) 70grams e) None of these
- 47. The milk and water in two vessels A and B are in the ratio 4:3 and 2:3 respectively. In what ratio the liquids in both the vessels be mixed to obtain a new mixture in vessel c consisting half milk and half water? a) 7:5 b) 2:5 c) 10:7 d) 5:3 e) None of these
- 48. Milk and water are mixed in the vessels A and B in the ratios 5:2 and 8:5 respectively. In what proportion should quantities be taken from the two vessels so as to form a mixture containing milk and water in the ratio 9:4? a) 7:2 b) 5:2 c) 2:7 d) 1:7
- 49. Milk and water are in the ratio of 3:2 in a mixture of 80 liters. How much water should be added so that the rate of milk and water become 2:3? a) 25 b) 40 c) 35 d) 20
- 50. Milk contains 15% water. What quantity of pure milk should be added to 50 litres of milk to reduce the quantity of water to 12%? a) 16litres b) 14litres c) 12.5litres d) 17litres
  - e) None of these
- 51. Dhal worth Rs. 110 per kg and Rs. 95 per kg are mixed with a third variety in the ratio 1:1:2. If the mixture is worth Rs. 115 per kg, the price of the third variety per kg will be:

a) Rs.127.5	b) Rs.115.75
c) Rs.125	d) Rs.117.5
e) None of these	

- 52. A zookeeper counted the heads of the animals in a zoo and found it to be 100. When he counted the legs of the animals he found it to be 340. If the zoo had either pigeons or elephants, how many pigeons were there in the zoo? a) 45 b) 30 c) 70 d) 50
- 53. In what ratio must a person mix three kinds of Oats costing him Rs 1.20, Rs 1.44 and Rs 1.74 per Kg so that the mixture may be worth Rs 1.41 per Kg? b) 11:45:7 a) 12 : 7 : 7 c) 25 : 45 : 8 d) 27 : 23 : 6
- 54. One alloy contains silver and copper in the ratio 5:1 and the other contains in the ratio 7:2 respectively.

What weights of the 2<sup>nd</sup> must be melted together, so as to make a 5 lb mass with 80% silver? a) 5lb, 3lb b) 7lb, 2lb c) 2lb, 3lb d) 2lb 5lb

- 55. A and B are 2 alloys of gold and copper in the ratio 6:3 and 4:7. Equal quantities of these alloy mixed to form a new alloy. The ratio of gold and copper in the new alloy is: a) 20:21 b) 21:20 c) 24:23 d) 17:16
- 56. Three vessels whose capacities are in the ratio of 6:3:2 are completely filled with milk and water. The ratio of milk and water in the mixture 2:3, 4:2 and 5:2. Taking ¼ of first, 1/2 of second and ½ of third , new mixture kept in a new vessel. What is the percentage of water in the new mixture?
  - b) 42<sup>2</sup>/<sub>14</sub>% a) 42% c) 43% d) 40%
- 57. A company is creating a new signature drink. They are using two alcoholic ingredients in the drink vodka and gin. They are using two non-alcoholic ingredients in the drink: orange juice and cranberry juice. The alcoholic ingredients contain 50% alcohol. The non-alcoholic ingredients contain no alcohol. How many litres of non-alcoholic ingredients must be added to 5 litres of alcoholic ingredients to produce a mixture that is 20% alcohol? a) 8 d) 9
  - b) 6.5 c) 7.5
- 58. 1st mixture contains 30% zinc and rest copper and a 2nd mixture contains 20% zinc and rest copper. Some quantity is taken out of 1st mixture and twice this quantity is taken from 2nd mixture and mixed in a bottle. Find the ratio of copper to zinc in the bottle. a) 31 : 12 b) 23 : 7 c) 22 : 13 d) 25 : 9 e) None of these
- 59. An alloy of gold, silver and bronze contains 90% bronze, 7% gold and 3% silver. A second alloy of bronze and silver only is melted with the first and the mixture contains 85% of bronze, 5% of gold and 10% of silver. Find the percentage of bronze in the second alloy.
  - b) 72.5% a) 75% c) 70% d) 67.5%

#### **Removal and Replacement**

- 60. A container contains 40 liters of the milk. From the container, 4 liters of the milk was taken out and replaced by water. This process was repeated further two times. How much milk is now contained by the container? a) 29.61 liters b) 30.16 liters
- c) 29.16 liters d) 13.16 liters 61. In a 80 litre mixture of milk and water, the % of water
- is only 25%. The milkman gave 15 litres of this mixture to a customer and then added 15 litres of water to the remaining mixture. What is the approx. % of milk in the final mixture?

62. A jar containing 60litres of mixture of milk and water. The respective ratio of milk and water in the ratio 7:5.

a) 61% b) 57% c) 49% d) 63%



From the jar 12litres of mixture was taken out and 6 litres of pure milk was added. What is the respective ratio of milk and water after the final operation? b) 12:17 c) 13:19 a) 17:10 d) 9:7

63. A vessel contains 63 litres of a mixture of milk and water. The ratio of milk to water is 3:4. If 14 litres of mixture is taken out from that vessel and then 6 litres of water added to it, What will be the percentage of milk in the final mixture? a) 40% b) 39% c) 38% d) 37%

64. 15 litres of the milk is drawn out of a jar and filled with water. This operation is performed 1 more times. If the ratio of the quantity of milk left in jar to that of water in jar is 16 : 9, what was the initial quantity of milk present in the jar? a) 60 litres b) 55 litres c) 80 litres d) 85 litres e) 75 litres

65. A mixture contains A and B in the ratio 5 : 9. 14 litres of this mixture is taken out and 14 litres of B is poured in. Now the ratio of A to B becomes 2 : 5. Find the amount of B originally present in the mixture.

a) 25 litres	b) 45 litres	c) 55 litres
d) 40 litres	e) 35 litres	

66. A mixture contains A and B in the ratio 5:7. 24 liters of this mixture is taken out and 15 liters of A is poured in. Now the ratio of A to B becomes 10:7. Find the amount of B originally present in the mixture. b) 45 litres c) 55 litres a) 25 litres d) 40 litres e) 35 litres

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67.	There are two vessels A and B, A containing 120
	liters of milk and B containing 120 liters of water. 30
	liters is drawn from A and poured into B and then 30
	liters from B is poured back into A. This process is

the ratio of milk and water in A?

repeated once. At the end of this repetition, what is

#### Mixed

- 68. Two vessels P and Q were partially filled with milk. 80% of the contents of P were transferred to Q. 60% of the contents of Q were then transferred back to P. At this stage, the ratio of the quantities of milk in P and Q is 23:12. Find the ratio of the initial volumes of milk is P and Q. a) 5:3 b) 10:6 c) 15:11 d) 5:2
- 69. Two varieties of tea costing Rs. 280 per kg and Rs. 180 per kg are mixed in certain ratios to form varieties A and B. A and B are mixed in the ratio 1:2 to form ssvariety C which is sold for Rs. 288 per kg at 20% profit. If A costs Rs. 200 per kg, in what ratio were the two varieties mixed to form B?

70. Milk, equal to25% of a solution of milk and water, is added to the solution. If the ratio of milk and water in the resultant solution is 3 : 1, find the ratio of milk and water in the original solution.

- 71. A solution has 64% milk one-sixth of the solution is removed and replaced with milk. This is called the operation. How many times should the operation be done so that percentage of milk is more than 80%?
- 72. There are three varieties of tea I, II, III -available in the market. Mani bought a certain quantity of each variety. The average cost per kg of varieties I and II for the quantities he bought worked out to be Rs. 50. The same for varieties II and III is Rs. 60 and that for varieties I and III is Rs. 68. Which of the following cannot be the average cost per kg of all the three varieties of tea that he bought? a) Rs. 56 b) Rs. 61 c) Rs. 63 d) Rs. 65
- 73. The scores obtained by a student in five FundaCAT's were 104, 125, 133, 148 and 175, not necessarily in the same order. If the student observed that his average score per test, which he evaluated after each test, was always an integer, find the difference between his score in the third test and that in the fourth test.
- 74. A rice merchant has four varieties of rice A, B, C and D - with him. He mixed the entire quantity of the rice of varieties A and B with him. With this mixture, if he mixes the entire quantity of the rice of variety C, which costs Rs.20 per kg, the mixture so formed would cost Rs.25 per kg. Instead, if he mixes with it the entire quantity of the rice of variety D, which costs Rs.36 per kg, the mixture so formed would cost Rs.31 per kg. If the entire quantity of the rice of variety D is thrice that of the rice of variety C, how much would the mixture of the entire quantity of the rice of all the four varieties cost?
  - a) Rs.26.5 per kg
  - b) Rs.28 per kg
  - c) Rs.29.5 per kg
  - d) Cannot be determined
- 75. The ratio of milk and water in a mixture of the two is 3:1. First, the volume of the mixture is increased by 50% by adding water. Next, 25 litres of the mixture is replaced with water. If the final ratio of milk and water in the resultant mixture is 1:3, find the initial quantity of mixture present (in litres). a) 163.33 b) 33.33 c) 40.66 d) 80.33
- 76. The density of a liquid is defined as the mass per unit volume of the liquid. The densities of two liquids, A and B, are in the ratio 2 : 1. 70 kg of liquid A is mixed with 30 kg of liquid of B to form a mixture. In this mixture, liquid B evaporates at a rate (in kg/hr) which is twice as fast compared to that of liquid A, which evaporates at a rate of 1 kg/hour. Find the number of hours for which the mixture needs to be evaporated, for the density of the resultant mixture to become 1.04 times that of the original mixture (i.e., before evaporation). a) 2.5 b) 3 c) 3.5 d) 4
- 77. Consider a class of 40 students whose average weight is 40 kgs. m new students join this class whose average weight is n kgs. If it is known that m



+ n = 50, what is the maximum possible average weight of the class now?
a) 40.18 kgs
b) 40.56 kgs

, 3	, 3
c) 40.67 kgs	d) 40.49 kgs

- 78. The average score in an examination of 10 students of a class is 60. If the scores of the top five students are not considered, the average score of the remaining students falls by 5. The pass mark was 40 and the maximum mark was 100. It is also known that none of the students failed. If each of the top five scorers had distinct integral scores, the maximum possible score of the topper is......

  a) 99
  b) 100
  c) 87
  d) 95
- 79. 1 unit of x% alcohol is mixed with 3 units of y% alcohol to give 60% alcohol. If x > y, how many integer values can x take? a) 19 b) 20 c) 21 d) 13
- 80. Class A has boys to girls in the ratio 2 : 3, Class B has girls to boys in the ratio 5 : 3. If the number of students in Class A is at least twice as many as the number of students in Class B, what is the minimum percentage of boys when both classes are considered together?
  a) 33.33%
  b) 40%
  - c) 39.17% d) 37.5%
- 81. 100 kgs of an alloy of tin and lead in the ratio 1:3 is mixed with x kgs of an alloy of tin and lead in the ratio 3:2. If the overall alloy should contain between 40% and 50% tin, what is the range of values x can take?

a) 100 kgs ≤ x ≤ 200 kgs
b) 80 kgs ≤ x ≤ 240 kgs
c) 110 kgs ≤ x ≤ 220 kgs
d) 75 kgs ≤ x ≤ 250 kgs

82. A fruit seller has oranges, apples and guavas in the ratio 2:5:8. The number of apples is more than the number of oranges by a number that is a multiple of both 6 and 8. What is the minimum number of fruits in his shop?

a) 240	b) 360	c) 120	d) 90

83. A man buys juice at Rs 10/litre and dilutes it with water. He sells the mixtures at the cost price and thus gains 11.11%. Find the quantity of water mixed by him in every litre of juice.

a) 0.1 lit	b) 0.909 lit.
c) 0.125 lit	d) 0.111 lit

- 84. There are 500 rooms in a multi-floored hotel. However, due to a change in rule, the hotel has to decrease the number of floors by 5. However, the management is able to put 5 more rooms in each floor. Over all, the number of rooms in the hotel decreases by 10%. Find the number of floors and the number of rooms/floor the hotel originally had?
  - a) 10 floors 50 rooms
  - b) 20 floors 20 rooms
  - c) 20 floors 25 rooms
  - d) 50 floors 10 rooms

85. Arun has 13 boxes of chocolates with him, with an average of 17 chocolates per box. If each box has at least 11 chocolates and no two boxes have equal number of chocolates, then what can be the maximum possible number of chocolates in any box?

a) 23 b) 25 c) 29 d) CBD

86. Alphonso, on his death bed, keeps half his property for his wife and divides the rest equally among his three sons Ben, Carl and Dave. Some years later Ben dies leaving half his property to his widow and half to his brothers Carl and Dave together, shared equally. When Carl makes his will he keeps half his property for his widow and the rest he bequeaths to his younger brother Dave. When Dave dies some years later, he keeps half his property for his widow and the remaining for his mother. The mother now has Rs 1,575,000.

What was Carl's original share? (a) Rs 4 lakh (b) Rs 12 lakh (c) Rs 6 lakh (d) Rs 5 lakh

87. Alphonso, on his death bed, keeps half his property for his wife and divides the rest equally among his three sons Ben, Carl and Dave. Some years later Ben dies leaving half his property to his widow and half to his brothers Carl and Dave together, shared equally. When Carl makes his will he keeps half his property for his widow and the rest he bequeaths to his younger brother Dave. When Dave dies some years later, he keeps half his property for his widow and the remaining for his mother. The mother now has Rs 1,575,000.

What was the ratio of the property owned by the widows of the three sons, in the end?

a) 7 : 9 : 13	(b) 8 : 10 : 15
c) 5 : 7 : 9	(d) 9 : 12 : 13

88. Alphonso, on his death bed, keeps half his property for his wife and divides the rest equally among his three sons Ben, Carl and Dave. Some years later Ben dies leaving half his property to his widow and half to his brothers Carl and Dave together, shared equally. When Carl makes his will he keeps half his property for his widow and the rest he bequeaths to his younger brother Dave. When Dave dies some years later, he keeps half his property for his widow and the remaining for his mother. The mother now has Rs 1,575,000.

What was the worth of the total property?(a) Rs 30 lakh(b) Rs 8 lakh(c) Rs 18 lakh(d) Rs 24 lakh

- 89. There are two containers : the first contains 500 ml of alcohol, while the second contains 500 ml of water. Three cups of alcohol from the first container is removed and is mixed well in the second container. Then three cups of this mixture is removed and is mixed in the first container. Let 'A' denote the proportion of water in the first container and 'B' denote the proportion of alcohol in the second container. Then,
  - (a) A > B (b) A < B
  - (c) A = B (d) Cannot be determined

90. Mr Launcher plans to launch a new TV channel called Dekha Dekhi (DD). He envisages a viewership of 42%. He plans to capture the viewership from CAT TV and MAT TV, which currently hold viewership of 35% and 48%, each having a distinct and separate target audience. In what ratio should he capture the target audience of the two channels

(a) 6:7 (b) 7:6 (c) 1:1 (d) 8:9

- 91. There are seven consecutive natural numbers such that the average of the first five is n. Then average of all seven numbers will be?
  - (a) n (b) n+1
  - (c) kn + 1/k where k is a positive constant.
  - (d) n + 2/7
- 92. Three maths classes: X, Y and Z take an algebra test.

The average score in class X is 83.

The average score in class Y is 76.

The average score in class Z is 85.

The average score of all students in classes X and Y together is 79.

The average score of all students in classes Y and Z together is 81.

What is the average for all the three classes?(a) 81(b) 81.5(c) 82(d) 84.5

93. A set of consecutive positive integers beginning with 1 is written on the blackboard. A student came along and erased one number. The average of the remaining numbers is 35 17/7. What was the number erased?

(a) 7 (b) 8 (c) 9 (d) None

- 94. The number of employees in Obelix Menhir Co. is a prime number and is less than 300. The ratio of the number of employees who are graduates and above, to that of employees who are not, can possibly be:
  - (a) 101 : 88 (b) 87 : 100
  - (c) 110 : 111 (d) 85 : 98 (e) 97 : 84
- 95. Ten years ago, the ages of the members of a joint family of eight people added up to 231 years. Three



years later, one member died at the age of 60 years and a child was born during the same year. After another three years, one more member died, again at 60, and a child was born during the same year. The current average age of this eight–member joint family is nearest to

(a) 24 years (b) 23 years (c) 22 years (d) 21 years

- 96. On 1st January, 2000 the average age of a family of 6 people was 'A' years. After 5 years a child was born in the family and one year after that the average age was again found to be 'A' years. What is the value of 'A'? (Assume that there are no other deaths and births.)
  (a) 25 (b) 35 (c) 37 (d) 39
- 97. Two different solutions of honey, milk and water are mixed with each other three times in varying proportions. The concentration of honey and milk in the three resulting solutions are found to be (10%, 16%), (12%, 12%) and (16%, x%) respectively. What is the value of x?
  (a) 4 (b) 7 (c) 8 (d) 10
- 98. The average age of a couple is 25 years. The average age of the family just after the birth of the first child was 18 years. The average age of the family just after the second child was born was 15 years. The average age of the family after the third and the fourth children (who are twins) were born was 12 years. If the present average age of the family of six persons is 16 years, how old is the eldest child?
  - (a) 6 years (c) 8 years

(b) 7 years (d) 9 years

99. The ratio of alcohol to water in an alcohol-water solution is 9 : 1. The rate of evaporation per hour of alcohol and water on boiling is 20% and 5% respectively. The minimum number of hours for which the solution needs to be boiled so as it contains at least 18% of water?
(a) 3 (b) 4 (c) 3.5 (d) 4.5

# FundaMakers

## **CAT PAST YEAR QUESTIONS**

- The arithmetic mean of scores of 25 students in an examination is 50. Five of these students top the examination with the same score. If the scores of the other students are distinct integers with the lowest being 30, then the maximum possible score of the toppers is CAT 2021
- If a certain weight of an alloy of silver and copper is mixed with 3 kg of pure silver, the resulting alloy will have 90% silver by weight. If the same weight of the initial alloy is mixed with 2 kg of another alloy which has 90% silver by weight, the resulting alloy will have 84% silver by weight. Then, the weight of the initial alloy, in kg, is CAT 2021

   a) 3
   b) 4
   c) 2.5
   d) 3.5
- 3. In a football tournament, a player has played a certain number of matches and 10 more matches are to be played. If he scores a total of one goal over the next 10 matches, his overall average will be 0.15 goals per match. On the other hand, if he scores a total of two goals over the next 10 matches, his overall average will be 0.2 goals per match. The number of matches he has played is **CAT 2021**
- 4. From a container filled with milk, 9 litres of milk are drawn and replaced with water. Next, from the same container, 9 litres are drawn and again replaced with water. If the volumes of milk and water in the container are now in the ratio of 16 : 9, then the capacity of the container, in litres, is **CAT 2021**
- 5. Suppose hospital A admitted 21 less Covid infected patients than hospital B, and all eventually recovered. The sum of recovery days for patients in hospitals A and B were 200 and 152, respectively. If the average recovery days for patients admitted in hospital A was 3 more than the average in hospital B then the number admitted in hospital A was 35

CAT 2021

- 6. Onion is sold for 5 consecutive months at the rate of Rs 10, 20, 25, 25, and 50 per kg, respectively. A family spends a fixed amount of money on onion for each of the first three months, and then spends half that amount on onion for each of the next two months. The average expense for onion, in rupees per kg, for the family over these 5 months is closest to CAT 2021

  a) 26
  b) 16
  c) 20
  d) 18
- 7. The strength of an indigo solution in percentage is equal to the amount of indigo in grams per 100 cc of water. Two 800 cc bottles are filled with indigo solutions of strengths 33% and 17%, respectively. A part of the solution from the first bottle is thrown away and replaced by an equal volume of the solution from the second bottle. If the strength of the indigo solution in the first bottle has now changed to 21% then the volume, in cc, of the solution left in the second bottle is CAT 2021

8. Dick is thrice as old as Tom and Harry is twice as old as Dick. If Dick's age is 1 year less than the average age of all three, then Harry's age, in years, is

CAT 2020

- 9. A batsman played n + 2 innings and got out on all occasions. His average score in these n + 2 innings was 29 runs and he scored 38 and 15 runs in the last two innings. The batsman scored less than 38 runs in each of the first n innings. In these n innings, his average score was 30 runs and lowest score was x runs. The smallest possible value of x is CAT 2020 a) 1 b) 3 c) 2 d) 4
- 10. Two alcohol solutions, A and B, are mixed in the proportion 1:3 by volume. The volume of the mixture is then doubled by adding solution A such that the resulting mixture has 72% alcohol. If solution A has 60% alcohol, then the percentage of alcohol in solution B is CAT 2020

  a) 94%
  b) 92%
  c) 90%
  d) 89%
- 11. In a group of 10 students, the mean of the lowest 9 scores is 42 while the mean of the highest 9 scores is 47. For the entire group of 10 students, the maximum possible mean exceeds the minimum possible mean by CAT 2020

  a) 5
  b) 3
  c) 4
  d) 6
- 12. Let A, B and C be three positive integers such that the sum of A and the mean of B and C is 5. In addition, the sum of B and the mean of A and C is 7. Then the sum of A and B is CAT 2020

  a) 6
  b) 4
  c) 7
  d) 5
- 13. An alloy is prepared by mixing metals A, B, C in the proportion 3:4:7 by volume. Weights of the same volume of metals A, B, C are in the ratio 5:2:6. In 130 kg of the alloy, the weight, in kg, of the metal C is CAT 2020

  a) 84
  b) 48
  c) 96
  d) 70
- 14. The average of 30 integers is 5. Among these 30 integers, there are exactly 20 which do not exceed 5. What is the highest possible value of the average of these 20 integers? CAT 2019

  a) 4
  b) 5
  c) 4.5
  d) 3.5
- 15. The strength of a salt solution is p% if 100 ml of the solution contains p grams of salt. Each of three vessels A, B, C contains 500 ml of salt solution of strengths 10%, 22%, and 32%, respectively. Now, 100 ml of the solution in vessel A is transferred to vessel B. Then, 100 ml of the solution in vessel B is transferred to vessel C. Finally, 100 ml of the solution in vessel A is transferred to vessel C. Finally, 100 ml of the solution in vessel A is transferred to vessel A. The strength, in percentage, of the resulting solution in vessel A is **CAT 2019** 
  - a) 15 b) 12 c) 13 d) 14
- A chemist mixes two liquids 1 and 2. One litre of liquid 1 weighs 1 kg and one litre of liquid 2 weighs 800 gm. If half litre of the mixture weighs 480 gm,



then the percentage of liquid 1 in the mixture, in terms of volume, is CAT 2019 b) 85 c) 80 d) 75 a) 70

17. Ramesh and Gautam are among 22 students who write an examination. Ramesh scores 82.5. The average score of the 21 students other than Gautam is 62. The average score of all the 22 students is one more than the average score of the 21 students other than Ramesh. The score of Gautam is

a) 51

b) 53 c) 49

CAT 2019 d) 48

- 18. There are two drums, each containing a mixture of paints A and B. In drum 1, A and B are in the ratio 18:7. The mixtures from drums 1 and 2 are mixed in the ratio 3: 4 and in this final mixture, A and B are in the ratio 13 : 7. In drum 2, then A and B were in **CAT 2018** the ratio a) 251 : 163 b) 239 : 161 c) 220 : 149 d) 229 : 141
- 19. A 20% ethanol solution is mixed with another ethanol solution, say, S of unknown concentration in the proportion 1:3 by volume. This mixture is then mixed with an equal volume of 20% ethanol solution. If the resultant mixture is a 31.25% ethanol solution, then the unknown concentration of S is CAT 2018 a) 50% b) 55% c) 48% d) 52%
- 20. A jar contains a mixture of 175 ml water and 700 ml alcohol. Gopal takes out 10% of the mixture and substitutes it by water of the same amount. The process is repeated once again. The percentage of water in the mixture is now CAT 2018 a) 25.4 b) 20.5 c) 30.3 d) 35.2
- 21. The strength of a salt solution is p% if 100 ml of the solution contains p grams of salt. If three salt solutions A, B, C are mixed in the proportion 1:2: 3, then the resulting solution has strength 20%. If instead the proportion is 3:2:1, then the resulting solution has strength 30%. A fourth solution, D, is produced by mixing B and C in the ratio 2 : 7. The ratio of the strength of D to that of A is CAT 2018 a) 3 : 10 b) 1 : 3 c) 2 : 5 d) 1:4
- 22. A trader sells 10 litres of a mixture of paints A and B, where the amount of B in the mixture does not exceed that of A. The cost of paint A per litre is Rs. 8 more than that of paint B. If the trader sells the entire mixture for Rs. 264 and makes a profit of 10%, then the highest possible cost of paint B, in Rs. per CAT 2018 litre, is a) 20 b) 16 c) 22 d) 26
- 23. A CAT aspirant appears for a certain number of tests. His average score increases by 1 if the first 10 tests are not considered, and decreases by 1 if the last 10 tests are not considered. If his average scores for the first 10 and the last 10 tests are 20 and 30, respectively, then the total number of tests taken by him is [TITA] **CAT 2018**

24. A wholesaler bought walnuts and peanuts, the price of walnut per kg being thrice that of peanut per kg. He then sold 8 kg of peanuts at a profit of 10% and 16 kg of walnuts at a profit of 20% to a shopkeeper. However, the shopkeeper lost 5 kg of walnuts and 3 kg of peanuts in transit. He then mixed the remaining nuts and sold the mixture at Rs. 166 per kg, thus making an overall profit of 25%. At what price, in Rs. per kg, did the wholesaler buy the walnuts?

a) 84 b) 86 CAT 2018

- d) 98

CAT 2017

d) 26

25. In an apartment complex, the number of people aged 51 years and above is 30 and there are at most 39 people whose ages are below 51 years. The average age of all the people in the apartment complex is 38 years. What is the largest possible average age, in years, of the people whose ages are below 51 years? CAT 2018 c) 27 a) 25 b) 26 d) 28

c) 96

- 26. Bottle 1 contains a mixture of milk and water in 7:2 ratio and Bottle 2 contains a mixture of milk and water in 9:4 ratio. In what ratio of volumes should the liquids in Bottle 1 and Bottle 2 be combined to obtain a mixture of milk and water in 3:1 ratio? CAT 2017 a) 27 : 14 b) 27 : 13 c) 27 : 16 d) 27:18
- 27. The average height of 22 toddlers increases by 2 inches when two of them leave this group. If the average height of these two toddlers is one-third the average height of the original 22, then the average height, in inches, of the remaining 20 toddlers is

a) 30 b) 28 c) 32

- 28. Consider three mixtures the first having water and liquid A in the ratio 1 : 2, the second having water and liquid B in the ratio 1:3, and the third having water and liquid C in the ratio 1 : 4. These three mixtures of A, B, and C, respectively, are further mixed in the proportion 4:3:2. Then the resulting mixture has CAT 2017
  - a) The same amount of water and liquid B
  - b) The same amount of liquids B and C
  - c) More water than liquid B
  - d) More water than liquid A
- 29. An elevator has a weight limit of 630 kg. It is carrying a group of people of whom the heaviest weighs 57 kg and the lightest weighs 53 kg. What is the maximum possible number of people in the group? (TITA) CAT 2017
- 30. A class consists of 20 boys and 30 girls. In the midsemester examination, the average score of the girls was 5 higher than that of the boys. In the final exam, however, the average score of the girls dropped by 3 while the average score of the entire class increased by 2. The increase in the average score of CAT 2017 the boys is: a) 9.5 b) 10 c) 4.5 d) 6



#### **ANSWER KEY**

1. 109.2	2. 70	3. B	4. A	5. B	6. A	7. A	8. C	9. C	10. C
11. A	12. B	13. A	14. C	15. B	16. C	17. B	18. C	19. B	20. D
21. D	22. A	23. B	24. A	25. D	26. B	27. D	28. C	29. D	30. B
31. B	32. 53	33. CBD	34. C	35. B	36. A	37. A	38. C	39. A	40. D
41. C	42. C	43. B	44. C	45. D	46. B	47. A	48. A	49. B	50. C
51. A	52. B	53. A	54. C	55. D	56. B	57. C	58. B	59. B	60. C
61. A	62. A	63. C	64. E	65. B	66. C	67. 17:8	68. D	69. D	70. 11:5
71.4	72. D	73. 44	74. C	75. B	76. D	77. B	78. A	79. D	80. C
81. D	82. C	83. D	84. C	85. A	86. A	87. B	88. D	89. C	90. A
91. B	92. B	93. A	94. E	95. A	96. C	97. A	98. D	99. B	

#### ANSWER KEY (CAT PAST YEAR QUESTIONS)

1. 92	2. A	3. 10	4. 45	5. 35	6. D	7. 200	8. 18	9. c	10.B
11.C	12.A	13.A	14.C	15.D	16.C	17.A	18.B	19.A	20.D
21.B	22.A	23.60	24.C	25.D	26.B	27.C	28.C	29.11	30.A

