Average

Type – 1 (Basic question)

1. Find the average of 212, 208, 213, 207, 211, 209.

   (a) 200 (b) 213 (c) 210 (d) 218.5

2. The weights of 7 students of a class are 48kg, 52kg, 40kg, 60kg, 53kg, 54kg and 49kg.The average weight of the class is.

   (a) 50.85kg (b) 52.38kg (c) 51.95kg (d) 53.33kg

3. Set A contains seven numbers and the average of these numbers is 41. Set B contains five numbers and the average of these numbers is 44. Find the average of the sets.

(a) 35.55 (b) 40.88 (c) 45 (d) 42.25

4. The Average of 21 data is 36 out of which the first 12 data are having average of 15. Find the average of rest of 9 data.

(a) 46 (b) 58 (c) 64 (d) 60.

5. The average of 6 numbers is 8. What must be the 7^{th} number so that the average becomes 10.

(a) 8 (b) 15 (c) 16 (d) 22

Type- 2 (Replacement)

Concept:

New = Old ± increase/ decrease in avg × Final observation

=> " + " for increase in average

=> " – " for decrease in average

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6. There are 50 students in a class. One of them weighing 50kg goes away and a new student joins. By this the average weight of the class is increased by 1/2kg. The weight of the new student is.

(a) 50kg (b) 75kg (c) 65kg (d) 45kg

7. Out of 10 teachers of a school, one teacher retires and in place of him a new teacher of age 25year joins. As a result average age of teachers reduces by 3years. Find the age of retired teacher.

(a) 60year (b) 55year (c) 52year (d) 66year

8. Average age of 8 members is increased by 3yrs when two of them whose age are 30 and 34 yrs are replaced by two member having same age. What is the age of two new members ?

(a) 35yrs (b) 29yrs (c) 40yrs (d) 44yrs

Type – 3 (Inclusion)

9. 24 student collected money for donation. The average contribution was Rs.50, later on their teacher also contributed some money. Now the average contribution is Rs.56. The contribution of teacher is.

(a) Rs.95 (b) Rs. 150 (c) Rs. 220 (d) Rs. 200

10. The average of 18 number is 37.5. If six numbers having an average of X are added to them, then the average of all numbers increases by 1. The value of X is.

(a) 41.5 (b) 38.6 (c) 42.5 (d) 40

Type-4 (Exclusion)

Concept:-

Excluded = Old average ± increase/ decrease in avg × Final Members

=> " − " for increase in average

=> " + " for decrease in average

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11. The average age of 30 students and their class teacher is 20yrs. If the class teacher age is excluded then average age reduces by 1yr. What is the age of class teacher.

(a) 50yrs (b) 45yrs (c) 35yrs (d) 32yrs

Type-5 (Mistaken Problems)

Concept:-

Step 1=> net average deviation = $\frac{\text{-(Mistaken) + (right number)}}{\text{number of given observation}}$

Step 2=> Correct Average = Given average ± net average deviation

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12. While finding the average of 10 given numbers, Arun by mistake wrote 64 in place of 46 and got his average as 50. The correct average of the given numbers will be.

(a) 52.3 (b) 44.6 (c) 50.8 (d) 48.2

13. The average age of 50 people was found to be 64yrs . It was found that ages of two persons were incorrectly entered as 38yrs and 42yrs instead of 83yrs and 24yrs. What is the correct average of the 50 people.

(a) 64.54yrs (b) 60.66yrs (c) 58.58yrs (d) 52.38yrs

Type – 6 (Cricket based problems)

14. The average run of a player is 32 runs out of 10 innings. How many runs he must score in the next innings so as to increase his average by 6 runs.

(a) 78 (b) 98 (c) 86 (d) 110

15. A batsman made certain average of runs in 16 innings. He made 85 runs in his 17^{th} inning as a result of which his average is increased by 3 runs. Find his average run after 17^{th} inning.

(a) 37 (b) 55 (c) 29 (d) 60

Type-7 (Concepts Based on Number System)

	SUM	AVERAGE
⇒Natural Number	$\frac{n(n+1)}{2}$	$\frac{(n+1)}{2}$
⇒Square	$\frac{n(n+1)(2n+1)}{6}$	$\frac{(n+1)(2n+1)}{6}$
⇒Cube	$\left(\frac{n(n+1)}{2}\right)^2$	$\frac{n(n+1)^2}{4}$
⇒Odd Number	n^2	n
⇒Even Number	$n(n+1)$	$(n+1)$

** (n= number of terms)

Average of an AP = $\frac{\text{First term + last term}}{2}$

** Arithmetic Progression (AP) => A series in which the difference between the terms are equal is called an AP

⇒Note:- (a) If in question it is asked to find average of odd numbers in between any two given range , then required average will be

$$= \frac{\text{First odd no of the range + last odd no of the range}}{2}$$

⇒(b) If in question it is asked to find average of even numbers in between any two given range , then required average will be

$$= \frac{\text{First even no of the range + last even no of the range}}{2}$$

16. (a) Find the average of the square of first 10 natural number.

(b) What is average of odd numbers from 100 to 500

(c) What is the average of first 5 multiple of 25

(d) What is the difference between the average of first 148 even numbers and the average of first 129 odd numbers.

(e) Find the average of all prime numbers between 50 and 76.

Type-8 (Increase and Decrease in average due to each number)

Concept:-

$$\text{Increase/Decrease in average due to each no} = \frac{\text{Difference btw two number}}{2}$$

	(Inc/Dec in average by new no)
⇒Natural number => 1, 2, 3, 4, 5,……	½ or 0.5
⇒Even number => 2, 4, 6, 8, 10,……	1
⇒Odd number => 1, 3, 5, 7, 9,….	1

17. The average of 30 continuous natural number is 15.5 . What will be the new average if 6 more consecutive numbers are added to it.

(a) 19.5 (b) 18.5 (c) 17.5 (d) 20.5

18. The average of 7 consecutive odd number is 31. If the previous and next odd numbers are included, then what will be the new average.

(a) 31 (b) 33 (c) 35 (d) 29

Type-9 (Net average or Weighted average or Combined average)

Concept:-

No. of data $\rightarrow n_1 \quad n_2 \quad n_3 \quad n_4$

Average $\rightarrow a_1 \quad a_2 \quad a_3 \quad a_4$

Net avg/weighted avg $\rightarrow \dfrac{n_1a_1 + n_2a_2 + n_3n_3 + n_4a_4}{n_1 + n_2 + n_3 + n_4}$

19. If the average weight of 10 box is 24kg and average weight of 5 table is 15kg. Find the combined average weight of box and table.

20. In a school the ratio of no of students in class 10^{th} ,11^{th} ,and 12^{th} are 9:17:14 and the average weight of boys of each classes are 53kg, 59kg and 64kg respectively. Find the average weight of the boys of all three classes.

(a) 59.4kg (b) 60kg (c) 62.5kg (d) 58.8kg

Type-10 (Average Speed)

Concept:-

1. Average speed = $\frac{\text{Total Distance Travelled}}{\text{Total Time Taken}}$

2. If A goes from P to Q with speed of x km/h and returns from Q to P with speed of y km/h, then the average speed of total journey is

$$\text{Average speed} = \frac{2xy}{x+y} = \frac{\textbf{total distance}}{\textbf{total time taken}}$$

3. If a distance is travelled with three different speeds a km/h, b km/h and c km/h, then Average speed of total journey $= \frac{3abc}{ab+bc+ca}$ km/h

21. Amit went to market with a speed of 30km/hr and return back to his home at a speed of 40km/hr . Find the average speed of amit in this whole transit.

22. A particular distance is travelled with 5 km/hr, 3 km/hr and 4km/hr. Find average speed of the whole journey.

Type-11 (Miscellaneous)

23. The average of 13 numbers is 30. The average of first 7 of these is 32 and last 7 of these is 26. Find the 7^{th} number.**

(a) 18 (b) 12 (c) 16 (d) 10

24.The average of 21 numbers is 44. The average of first 11 numbers is 48 and that of last 11 number is 42. If the 11^{th} number is excluded. What is the average of remaining numbers.

(a) 43 (b) 42 (c) 43.5 (d) 42.9

25. The average of 12 numbers is 42. The average of last 5 numbers is 40 and that of the first four numbers is 44. The 6^{th} number is 6 less than the fifth number and 5 less than the 7^{th} number. The average of 5^{th} and 7^{th} number is.

(a) 44.5 (b) 48.8 (c) 52.4 (d) 57.6