

KERALA HIGH COURT
OFFICE ATTENDANT EXAM

Numerical Ability

Averages

Key Concepts • Shortcuts • 25 Practice Questions • Answer Key with Solutions

1. Key Concepts

- **Average = Sum of observations / Number of observations.**
- **Sum = Average x Number of observations.** This is the most useful form in exam problems.
- The average always lies between the smallest and the largest value.
- If every value is increased (or decreased) by k , the average also increases (or decreases) by k . If every value is multiplied by k , the average is multiplied by k .
- Average of **equally spaced numbers** (like consecutive numbers) = the middle value = $(\text{first} + \text{last})/2$.

2. Standard Averages

Case	Average
First n natural numbers	$(n + 1) / 2$
First n even numbers	$n + 1$
First n odd numbers	n
First n multiples of k	$k (n + 1) / 2$
Numbers 1 to 100	50.5
Combined average of two groups	$(n_1 \times A_1 + n_2 \times A_2) / (n_1 + n_2)$
Average speed (same distance each way)	$2xy / (x + y)$

3. Useful Shortcuts

- **New member joins:** New member's value = New average $\times (n + 1)$ - Old sum.
- **Member leaves:** Leaving member's value = Old sum - New average $\times (n - 1)$.
- **Replacement:** If the average of n values changes by d on replacing one value, the new value = old value + $(n \times d)$.
- **Batting / marks problems:** New average = $(\text{Old sum} + \text{new score}) / (\text{innings} + 1)$.
- If the average of $x, x+2, x+4$ is A , then the middle term $x+2 = A$.

Quick tip: In average problems, first convert averages into totals (Sum = Average $\times$ Number), then add or subtract.

4. Practice Questions (25)

Q1. What is the average of 12, 15, 18, 21 and 24?

- (a) 16
- (b) 18
- (c) 20
- (d) 21

Q2. The average of the first 10 natural numbers is:

- (a) 5
- (b) 6
- (c) 5.5
- (d) 6.5

Q3. The average of the first 5 even numbers is:

- (a) 6
- (b) 4
- (c) 5
- (d) 8

Q4. The average of 8 numbers is 15. Their sum is:

- (a) 100
- (b) 110
- (c) 130
- (d) 120

Q5. The average of 4 numbers is 20. A fifth number 30 is added. The new average is:

- (a) 20
- (b) 22
- (c) 24
- (d) 25

Q6. The average of 5 numbers is 27. If one number is removed, the average of the remaining 4 becomes 25. The number removed is:

- (a) 30
- (b) 32
- (c) 35
- (d) 40

Q7. The average age of 30 students is 14 years. When the teacher's age is included, the average becomes 15. The teacher's age is:

- (a) 45
- (b) 40
- (c) 48
- (d) 50

Q8. The average of three numbers is 40. Two of them are 30 and 50. The third is:

- (a) 30
- (b) 45
- (c) 50
- (d) 40

Q9. A car goes from A to B at 40 km/h and returns at 60 km/h. The average speed for the whole journey is:

- (a) 50 km/h
- (b) 48 km/h
- (c) 52 km/h
- (d) 45 km/h

Q10. The average of 7 consecutive numbers is 20. The largest of them is:

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

Q11. A student's average in 4 subjects is 70. What must he score in the fifth subject to get an average of 72?

- (a) 80
- (b) 75
- (c) 78
- (d) 82

Q12. The average weight of 8 persons increases by 2 kg when a person weighing 60 kg is replaced by a new person. The weight of the new person is:

- (a) 70 kg
- (b) 72 kg
- (c) 74 kg
- (d) 76 kg

Q13. The average of 10 numbers is 15. If each number is increased by 5, the new average is:

- (a) 15
- (b) 20
- (c) 25
- (d) 10

Q14. The average of the first 5 multiples of 3 is:

- (a) 6
- (b) 8
- (c) 9
- (d) 10

Q15. The average of 25 numbers is 30. The average of the first 13 is 28 and of the last 13 is 32. The 13th number is:

- (a) 30
- (b) 28
- (c) 32
- (d) 31

Q16. A batsman's average after 10 innings is 40. He scores 62 in the 11th innings. His new average is:

- (a) 40
- (b) 41
- (c) 43
- (d) 42

Q17. The average of 11 results is 50. The average of the first six is 49 and of the last six is 52. The sixth result is:

- (a) 52
- (b) 56
- (c) 58
- (d) 54

Q18. The average age of a family of 5 members is 24 years. If the youngest member is 8 years old, the average age of the others is:

- (a) 24
- (b) 26
- (c) 28
- (d) 32

Q19. The average of three consecutive odd numbers is 15. The largest number is:

- (a) 17
- (b) 15
- (c) 19
- (d) 21

Q20. The average of the numbers 1 to 100 is:

- (a) 50
- (b) 51
- (c) 49.5
- (d) 50.5

Q21. Class A has 20 students with average marks 60 and Class B has 30 students with average 70. The combined average is:

- (a) 65
- (b) 66
- (c) 68
- (d) 70

Q22. The average of 5 numbers is 12. If each is multiplied by 3, the new average is:

- (a) 15
- (b) 24
- (c) 36
- (d) 45

Q23. The average salary of 20 workers is Rs 600. When the manager's salary is included, the average rises by Rs 50. The manager's salary is:

- (a) Rs 1650
- (b) Rs 1500
- (c) Rs 1800
- (d) Rs 1200

Q24. If the average of x , $x + 2$ and $x + 4$ is 9, then x is:

- (a) 5
- (b) 6
- (c) 8
- (d) 7

Q25. A man's average income for the first 6 months is Rs 4500 and for the next 6 months is Rs 5500. His average for the year is:

- (a) Rs 4800
- (b) Rs 5000
- (c) Rs 5200
- (d) Rs 5500

5. Answer Key

1-b | 2-c | 3-a | 4-d | 5-b | 6-c | 7-a | 8-d | 9-b | 10-c | 11-a | 12-d | 13-b | 14-c | 15-a | 16-d | 17-b | 18-c | 19-a | 20-d | 21-b | 22-c | 23-a | 24-d | 25-b

6. Solutions

- Q1. (b) 18 - Sum = 90. Average = $90/5 = 18$.
- Q2. (c) 5.5 - $(n + 1)/2 = 11/2 = 5.5$.
- Q3. (a) 6 - $2 + 4 + 6 + 8 + 10 = 30$. $30/5 = 6$. (Also $n + 1 = 6$.)
- Q4. (d) 120 - Sum = $15 \times 8 = 120$.
- Q5. (b) 22 - Old sum = 80. New sum = 110. $110/5 = 22$.
- Q6. (c) 35 - Total = 135. Remaining total = 100. Removed = 35.
- Q7. (a) 45 - $31 \times 15 - 30 \times 14 = 465 - 420 = 45$ years.
- Q8. (d) 40 - Total = 120. Third = $120 - 80 = 40$.
- Q9. (b) 48 km/h - Average speed = $2 \times 40 \times 60 / (40 + 60) = 4800/100 = 48$ km/h.
- Q10. (c) 23 - Middle number = 20, so the numbers are 17 to 23. Largest = 23.
- Q11. (a) 80 - Total needed = $72 \times 5 = 360$. Present total = 280. Fifth = 80.
- Q12. (d) 76 kg - Increase in total = $8 \times 2 = 16$. New person = $60 + 16 = 76$ kg.
- Q13. (b) 20 - Average also increases by 5: 20.
- Q14. (c) 9 - $3 + 6 + 9 + 12 + 15 = 45$. $45/5 = 9$.
- Q15. (a) 30 - Sum of first 13 = 364; last 13 = 416; together 780. Total of 25 = 750. 13th = $780 - 750 = 30$.
- Q16. (d) 42 - $(400 + 62)/11 = 462/11 = 42$.
- Q17. (b) 56 - Total = 550. First six = 294, last six = 312. Sixth = $294 + 312 - 550 = 56$.
- Q18. (c) 28 - Total = 120. Others = 112. $112/4 = 28$ years.
- Q19. (a) 17 - The numbers are 13, 15, 17. Largest = 17.
- Q20. (d) 50.5 - $(1 + 100)/2 = 50.5$.
- Q21. (b) 66 - $(1200 + 2100)/50 = 3300/50 = 66$.
- Q22. (c) 36 - New average = $12 \times 3 = 36$.
- Q23. (a) Rs 1650 - $21 \times 650 - 20 \times 600 = 13650 - 12000 = \text{Rs } 1650$.
- Q24. (d) 7 - Average = $x + 2 = 9$, so $x = 7$.
- Q25. (b) Rs 5000 - $(27000 + 33000)/12 = 60000/12 = \text{Rs } 5000$.