Moderate

1. An aeroplane flies along the four sides of a square field at speeds of 200, 400, 600 and 800 km/hr. The average speed of the plane in the flight around the field in km/hr is:

(a) 384 (b) 400 (c) 500
(d) 284 (e) None of these

2. The average speed of a cyclist who covers first, second and third km at 20, 16 and 12 km/hr respectively (in km/hr) is:

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(a) 16.24 (b) 16 (c) 15.66
(d) 15.32 (e) None of these

3. In a class of 100 students, the mean marks obtained in a subject is 30 and in another class of 50 students the mean marks obtained in the same subject is 60. The mean marks obtained by the students of two classes taken together is :
(a) 40 (b) 45 (c) 48
(d) 50 (e) None of these

4. The mean weight of 34 students of a school is 42 kg. If the weight of the teacher be included, the mean rises by 400 g. Find the weight (in kg) of the teacher.
(a) 66 (b) 56 (c) 55
(d) 57 (e) None of these

5. The average weight of 21 boys was recorded as 64 kg. If the weight of the 'teacher was added, the average increased by one kg. What was the teacher's weight?
(a) 86 kg (b) 64 kg (c) 72 kg
(d) 98 kg (e) None of these

6. Roshan bought 5 pants at Rs. 25 each, 10 shirts at Rs. 50 each and 15 ties at Rs. 35 each. Find the average price of all the articles.
(a) Rs. 38.33 (b) Rs. 45 (c) Rs. 60
(d) Rs. 45.33 (e) None of these

7. The mean weight of 150 students in a class is 60 kg. The mean weight of boys is 70 kg and that of girls is 55 kg. What is the number of boys in the class?
(a) 50 (b) 60 (c) 75
(d) 100 (e) None of these

8. The average of the test scores of a class of 'm' students is 70 and that of 'n' students is 91. When the scores of both the classes are combined, the average is 80. What is n/m?
(a) $\frac{11}{10}$ (b) $\frac{13}{10}$ (c) $\frac{10}{13}$
(d) $\frac{10}{11}$ (e) None of these

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9. The average marks of 120 students are 35. If average of passed students was 39 and failed students was 15, then Find the number of students who have passed?

(a) 80 (b) 100 (c) 120
(d) 140 (e) None of these

10. A person covers 9 km with a speed of 3 km/h, 25 km with a speed of 5 km/h and 30 km with a speed of 10 km/h. Find out the average speed of person?

(a) $5\frac{9}{11}$ km/h (b) $11\frac{5}{9}$ km/h (c) $9\frac{5}{11}$ km/h
(d) $5\frac{5}{11}$ km/h (e) None of these

11. Five years ago, the average age of P and Q was 15 yr. Now, average age of P, Q and R is 20 yr. What whould be the age of R after 10 yr?

(a) 35 yr (b) 40 yr (c) 30 yr
(d) 50 yr (e) None of these

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12. The average salary of the entire staff in an office is Rs. 500 per day. The average salary of officers is Rs. 750 and that of non-officers is Rs. 250. If the number of officers is 15, then find the number of non-officers in the office?

(a) 25 (b) 10 (c) 15
(d) 20 (e) None of these

13. Three year ago, the average age of a family of five members was 27 yr. The present average age is also 27 yr after the inclusion of a child into the family. Find the age of the child?

(a) 16 yr (b) 12 yr (c) 24 yr
(d) 20 yr (e) None of these

14. The average age of 5 sisters is 20 yr. If the age of the youngest sister be 4 yr, what was the average age of the group of sisters at the birth of the youngest sister?

(a) 25 yr (b) 15 yr (c) 18 yr
(d) 20 yr (e) None of these

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15. The average weight of 4 men A, B, C and D, is 67 kg. The 5th man E is included and the average weight decreases by 2 kg. A is replaced by F. The weight of F is 4 kg more than E. Average weight decreases because of the replacement of A and now the average weight is 64 kg. Find the weight of A?

(a) 78 kg (b) 66 kg (c) 75 kg
(d) 58 kg (e) None of these

16. Average of a, b and c is 11; average of c, d and e is 17; average of e and f is 22 and average of e and c is 17. Find out the average of a, b, c, d, e and f?

(a) $15\frac{2}{3}$ (b) $18\frac{1}{2}$ (c) $21\frac{1}{3}$
(d) $16\frac{1}{2}$ (e) None of these

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17. The average age of a man and his two twin born on the same day is 30 yr. The ratio of the ages of father and one son is 5 : 2, what is the father's age?

(a) 50 yr (b) 30 yr (c) 45 yr
(d) 20 yr (e) None of these

18. If the average of the ages of Rakesh and Mohan is 15, average of the ages of Mohan and Ramesh is 12 and the average of the ages of Rakesh and Ramesh is 13, then the age of Mohan, is?

(a) 16 (b) 13 (c) 14
(d) 12 (e) None of these

19. The average of three numbers is 28. If first number is half of the second and the 3rd number is twice the second, tthen the third number is?

(a) 48 (b) 36 (c) 24
(d) 18 (e) None of these

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20. The average temperature from Monday to Wednesday is 37°C while the average temperature from tuesday to thursday is 34°C. The temperature of thursday is $\frac{4}{5}$ times to that of Monday. Find the temperature of thursday?

(a) 36°C (b) 33°C (c) 37°C
(d) 34°C (e) None of these

21. The average salary of the entire staff in a office is Rs. 120 per month. The average salary of officers is Rs. 460 and that of non-officers is Rs. 110. If the number of officers is 15, then find the number of non-officers in the office?

(a) 610 (b) 510 (c) 410
(d) Can't be determined (e) None of these

22. The average of marks obtained by 150 candidates in a certain examination is 50. If the average marks of passed candidates is 55 and that of the failed candidates is 25, what is the number of candidates who passed the examination?

(a) 125 (b) 120 (c) 140
(d) 160 (e) None of these

23. The average age of 24 boys and their teacher is 15 years. When the teacher's age is excluded, the average age decreases by 1 year. The age of the teacher is?

(a) 38 years (b) 39 years (c) 40 years
(d) 41 years (e) None of these

24. The average age of 8 members of a group is 40 years. The age of 1 member is 55 yrs. After his retirement a new member comes in his place of age 39. What is the effect of his retirement on the average age of group?

(a) 2 (b) 0 (c) 3
(d) 5 (e) None of these

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25. The average age of 11 players of a cricket team is increased by 2 months when two of them aged 18 years and 20 years are replaced by two new players. The average age of the new players is?
(a) 19 years 1 month (b) 19 years 6 months
(c) 19 years 11 months (d) 19 years 5 months
(e) None of these

26. In a school, the average age of students is 6 years, and the average age of 12 teachers is 40 years. If the average age of the combined group of all the teachers and students is 7 years, then the number of students is?
(a) 396 (b) 400 (c) 408
(d) 416 (e) None of these

27. A batsman has a certain average in 11 innings. In the 12th innings, he scores 90 runs and his average decreases by 5. After the 12th innings what is his average?
(a) 145 (b) 130 (c) 135
(d) 140 (e) None of these

28. A cricketer gives 12.4 runs per wicket. He gives 26 runs and takes 5 wicket in a match after which his average becomes 12 per wicket. How many wickets had been taken till the last match?
(a) 85 (b) 90 (c) 65
(d) 72 (e) None of these

29. The average of a batsman after 25 innings was 56 runs per innings. If after the 26th inning his average increased by 2 runs, then find his score in the 26th inning?
(a) 100 (b) 102 (c) 108
(d) 98 (e) None of these

30. The average age of a class of 30 students and a teacher reduce by 0.5 years if we exclude the teacher. If the initial average is 14 years, find the age of the class teacher?
(a) 29 years (b) 30 years (c) 31 years
(d) 32 years (e) None of these

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31. The average marks of a group of 20 students on a test is reduced by 4 when the topper who scored 90 marks is replaced by a new students. Find the marks of the new student.
(a) 10 (b) 51 (c) 56
(d) 86 (e) None of these

32. The average age of x and y is 20 years. If z were to replace x, the average would be 19 and if z were to replace y, the average would be 21. Find the ages of x, y and z.
(a) 22, 18, 20 (b) 18, 22, 20 (c) 22, 18, 20
(d) 18, 20, 22 (e) None of these

33. The average age of a family of 6 members is 22 years. If the age of the youngest member be 7 years, then what was the average age of the family at the birth of the youngest member?
(a) 18 (b) 15 (c) 13
(d) 26 (e) None of these

34. The average age of 10 men is increased by 2 years when one of them of 25 years age, is replaced by new man. What is the age of new man?
(a) 50 (b) 45 (c) 35
(d) 25 (e) None of these

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35. The mean of the marks obtained by 100 students is 60. If the marks obtained by one of the students was incorrectly calculated as 75, whereas the actual marks obtained by him were 65, what is the correct mean of the marks obtained by the students?
(a) 59.9 (b) 59 (c) 58.5
(d) 59.4 (e) None of these

36. A, B, C and D are four consecutive even numbers respectively and their average is 65. What is the product of A and D?
(a) 3968 (b) 4092 (c) 4216
(d) 4352 (e) None of these

37. The average weight of 36 students is 50 kg. If was found later that the weight of one of the student was misread as 73 kg. whereas his actual weight was 37 kg. Find the correct average.
(a) 47 (b) 49.5 (c) 49
(d) 51 (e) None of these

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38. The average score of Sachin after 25 innings is 46 runs per innings. If after the 26th innings, his average runs increased by 2 runs, then what is his score in the 26th innings?
(a) 48 (b) 84 (c) 98
(d) 89 (e) None of these

39. 3 years ago the average age of a family of 5 members was 17 years, with the birth of a new baby, the average age of six members remains the same even today. Find the age of the new baby.
(a) 2 years (b) 3 years (c) 5 years
(d) can't be determined (e) None of these

40. The average marks of a student in four subjects is 75. If the student obtained 80 marks in the 5th subject then the new average is?
(a) 80 (b) 76 (c) 92
(d) 95 (e) None of these

Difficult

1. The average weight of A, B and C is 84 kgs. If D joins, the average weight now is 80 kgs. If another person E who is 3 kgs heavier than D replaces A then the average weight of B, C, D and E becomes 79 kgs. what is the weight of A?
(a) 70 kg (b) 75 kg (c) 65 kg
(d) 55 kg (e) None of these

2. A batsman has an average of 30 runs in his 42 inning. The difference between his maximum and minimum score is 100. If these two innings are removed his average for 40 innings comes down to 28. What is his minimum score?
(a) 20 (b) 30 (c) 45
(d) 40 (e) None of these

3. Five years ago the average age of husband and wife was 23 years. Today the average age of husband, wife and child is 20 yrs. How old is child?
(a) 3 yrs (b) 4 yrs (c) 12 yrs
(d) 2 yrs (e) None of these

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4. The average age of a husband and wife, who were married 7 years ago, was 25 years at the time of their marriage, Now, the average age of the family, including husband, wife and a child, born during the interval, is 22 years. What is the present age of the child?
(a) 4 yrs. (b) 2 yrs. (c) 3 yrs.
(d) 5 yrs. (e) None of these

5. The average age of mother, father and son was 42 yrs. at the time of the marriage of the son. After one year an infant was born in the family and after 6 yrs of marriage the average age of the family is 36 years. What was the age of the bride at the time of marriage.
(a) 25 yrs. (b) 23 yrs. (c) 22 yrs.
(d) 24 yrs. (e) None of these

6. There were 35 students in a hostel. If the number of students increases by 7, the expenses of the mess increase by Rs. 42 per day while the average expenditure per head decreases by Rs. 1. Find the original expenditure of the mess.
(a) Rs. 420 (b) Rs. 520 (c) Rs. 450
(d) Rs. 550 (e) None of these

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7. Ashish has earned an average of 4200 dollars for the first eleven months of the year. If he justifies his staying on in the US on the basis of his ability to earn at least 5000 dollars per month for the entire year, how much should he earn (in dollars) in the last month to achieve his required average for the whole year?
(a) 14,600 (b) 5,800 (c) 12,800
(d) 13800 (e) None of these

8. The sum of three numbers is 98. If the ratio between the first and second is 2 : 3 and that between the second and the third is 5 : 8, then the second number is
(a) 30 (b) 20 (c) 58
(d) 48 (e) None of these

9. The average salary per head of all the workers in a company is Rs. 95. The average salary of 15 officers is Rs. 525 and the average salary per head of the rest is Rs. 85. Find the total number of workers in the workshop.

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(a) 660 (b) 580 (c) 650
(d) 460 (e) None of these

10. A batsman makes a score of 270 runs in the 87th inning and thus increases his average by a certain number of runs that is a whole number. Find the possible values of the new average.
(a) 98 (b) 184 (c) 12
(d) All of these (e) None of these

11. 19 persons went to a hotel for a combined dinner party. 13 of them spent Rs. 79 each on their dinner and the rest spent Rs. 4 more than the average expenditure of all the 19. What was the total money spent by them.
(a) 1628.4 (b) 1534 (c) 1492
(d) 1496 (e) None of these

12. The average age of a group of persons going for a picnic is 16.75 years. 20 new persons with an average age of 13.25 years join the group on the spot due to which the average of the group becomes 15 years. Find the number of persons initially going for the picnic?
(a) 24 (b) 20 (c) 15
(d) 18 (e) None of these

13. The average salary of workers in AMS careers is Rs. 2,000, the average salary of faculty being Rs. 4,000 and the management trainees being Rs. 1,250. The total number of workers could be
(a) 450 (b) 300 (c) 110
(d) 500 (e) None of these

14. 10 years ago the average age of all the 25 teachers of the Girls college was 45 years. 4 years ago, the principal has retired from her post at the age of 60 year. So after one year a new principal whose age was 54 years recruited from outside. The present average age of all the teachers is, if principal is also considered as a teacher:

(a) $54\frac{18}{25}$ years (b) $55\frac{17}{25}$ years (c) $49\frac{1}{2}$ years

(d) $49\frac{2}{3}$ years (e) None of these

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15. The average weight of all the 11 players of Indian cricket team is 50 kg. If the average of first six lightest weight players is 49 kg and that of the six heaviest players is 52 kg. The average weight of the player which lies in the sixth position in the list of players when all the 11 players are arranged in the order of increasing or decreasing weights:

(a) 56 kg (b) 52 kg (c) 51 kg
(d) 50 kg (e) None of these

16. The average age of Sachin and Ganguli is 35 years. If Kaif replaces Sachin, the average age becomes 32 years and if Kaif replaces Ganguli, then the average age becomes 38 years. If the average age of Dhoni and Irfan be half of the average age of Sachin, Ganguli and Kaif, then the average age of all the five people is:

(a) 28 years (b) 32 years (c) 25 years
(d) 26 years (e) None of these

17. The average age of a family of 6 members 4 year ago was 25 years. Mean while a child was born in this family and still the average age of the whole family is same today. The present age of the child is:

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(a) 2 years (b) $1\frac{1}{2}$ years (c) 1 year
(d) data insufficient (e) None of these

18. Amitabh's average expenditure for the January to June is Rs. 4200 and he spends Rs. 1200 in January and Rs. 1500 in July. The average expenditure for the month of February to July is:

(a) Rs. 4250 (b) Rs. 4520 (c) Rs. 4060
(d) Rs. 4200 (e) None of these

19. The average price of 80 computers in an electronic shop is Rs. 30,000. If the highest and lowest price computers are sold out then the average price of the remaining 78 computers is Rs. 29,500. The cost of the highest price computer is Rs. 80,000. The cost of lowest price computer is:

(a) Rs. 19,000 (b) Rs. 20,000 (c) Rs. 29,000
(d) can't be determined (e) None of these

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20. Eleven years earlier the average age of a family of 4 members was 28 years. Now the age of the same family with six members is yet the same, even when 2 children were born in this period. If they belong to the same parents and the age of the first child at the time of the birth of the younger child was same as there were total family members just after the birth of the youngest member of this family, then the present age of the youngest member of the family is :

(a) 3 years (b) 5 years (c) 6 years
(d) 4 years (e) None of these

21. Mr. Patel walked 6 km to reach the station from his house, then he boarded a train whose average speed was 60 km/hr and thus he reached his destination. In this way he took total of 3 hours. If the average speed of the entire journey was 32 km/hr then the average speed of walking is :

(a) 3 km/hr (b) 4.5 km/hr (c) 4 km/hr
(d) 5 km/hr (e) None of these

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22. In a set of prime and composite numbers, the composite numbers are twice the number of prime number and the average of all the numbers of the set is 9. If the number of prime numbers and composite numbers are exchanged then the average of the set of numbers is increased by 2. If during the exchange of the numbers the average of the prime numbers and composite numbers individually remained constant, then the ratio of the average of composite numbers to the average of prime numbers (initially) was:

(a) $\frac{7}{13}$ (b) $\frac{13}{7}$ (c) 9/11
(d) $\frac{7}{11}$ (e) None of these

23. The average marks of Sameer decreased by 1, when he replaced the subject in which he has scored 40 marks by the other two subjects in which he has just scored 23 and 25 marks respectively. Later he has also included 57 marks of Computer Science, then the average marks increased by 2. How many subjects were there initially?

(a) 6 (b) 12 (c) 15
(d) can't be determined (e) None of these

24. The average age of Donald, his wife and their two children is 23 years. His wife is just 4 year younger than Donald himself and his wife was 24 years old when his daughter was born. He was 32 years old when his son was born. Th average age of Donald and his daughter is :

(a) 25 years (b) 22.5 years (c) 26 years
(d) can't be determined (e) None of these

25. There are 6 consecutive odd numbers in increasing order. The difference between the average of the squares of the first 4 numbers and the last four numbers is 64. If the sum of the squares of the first and the last element (i.e., odd numbers) is 178, then the average of all the six numbers is:

(a) 7 (b) 8 (c) 9
(d) 10 (e) None of these

26. The average age of board of directors of a company, having 10 directors was 48 years. Coincidentally when a director aged 53 resigned from the board of directors, another director died on the same day. So a new director joined the board of directors aged 34. Next year in the same month the average age of all the 9 directors was found to be 46 years. The age of the late (i.e., dead) director at the time of his death was :

(a) 56 years (b) 53 years (c) 57 years
(d) 61 years (e) None of these

Previous Year (Memory Based)

1. The average of 6 numbers is 20. If one number is removed, the average becomes 15. What is the number removed?

(a) 5 (b) 35 (c) 112
(d) 45 (e) None of these

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39. (c); Total age of men = 15 × 10 = 150

Total age of women = 25 × 12 = 300

Average age of the whole club = $\frac{150+300}{40} = \frac{450}{40}$ = 11.25 years.

40. (a); Let the average of rest results = x

According to the question

$14 \times 2 + x \times 10 = 15 \times 12 \Rightarrow 10x = 180 - 28$ $x = \frac{152}{10} \Rightarrow x = 15.2$

Hence average of the rest is 15.2

Moderate

1. (a); Let the side of square be a

and average speed of aeroplane x

$$\therefore \frac{a}{200}+\frac{a}{400}+\frac{a}{600}+\frac{a}{800}=\frac{4a}{x}$$

$$\Rightarrow \frac{12a+6a+4a+3a}{2400} = \frac{4a}{x} \Rightarrow \frac{25}{2400} = \frac{4}{x}$$

$\therefore$ x = 384

Hence average speed of a aeroplane = 384 km/hr

2. (d); Let the average speed of a cyclist = x

Total distance = 3 km

$$\therefore \frac{1}{20}+\frac{1}{16}+\frac{1}{12} = \frac{3}{x} \Rightarrow \frac{12+15+20}{240} = \frac{3}{x}$$

$$\frac{47}{240} = \frac{3}{x}$$ x = 15.32 km/hr

Average speed of cyclist is 15.32 km/hr

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3. (a); total marks obtained by 150 students.

$= 100 \times 30 + 50 \times 60 = 6000$

mean marks $= \frac{6000}{150} = 40$

4. (b); Let the weight of teacher = x kg

and average weight of students and teacher

$= 42 + .40 = 42.40$ kg

$\therefore$ $34 \times 42 + x = 35\ (42.4) \Rightarrow x = 1484 - 1428 = 56$ kg

Hence weight of the teacher is 56 kg.

Shortcut:

The mean rises by 0.4 kg and total number of persons = 35

Weight of teacher $= 42 + 0.4 \times 35 = 56$ kg

5. (a); Let the weight of teacher = x kg

According to the question

$\therefore$ $21 \times 64 + x = 22 \times 65$

$x = 1430 - 1344 \Rightarrow x = 86$ kg

Hence weight of the teacher is 86 kg.

Shortcut:

Teacher's weight $= 64 + 22 \times 1 = 86$ kg

6. (a); Total price of all the articles.

$= 5 \times 25 + 10 \times 50 + 15 \times 35$

$= 125 + 500 + 525 = 1150$ Rs.

Average price $= \frac{1150}{30} = 38.33$ Rs.

7. (a); Let the no of boys in a class = x

$\therefore x \times 70 + (150 - x)\ 55 = 150 \times 60$

$70x - 55x = 9000 - 8250 \Rightarrow 15x = 750$

$x = 50 \Rightarrow$ No. of boys = 50

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8. (d); Total score of a class of m students = 70 × m
Total score of a class of n students = 91 × n
∴ 70 m + 91n = (m + n) 80 70 m + 91n = 80m + 80 n

$$11n = 10\,m \Rightarrow \frac{n}{m} = \frac{10}{11}$$

9. (b); Let the no of passed student = x
According to the question
x × 39 + 15 (120 – x) = 120 × 35
39x – 15x = 4200 – 1800
24x = 2400 ⇒ x = 100
Hence no of passes student is 100.

10. (a); Here a = 9 km, b= 25 km, c = 30 km
P= 3 km/hr Q = 5 km/hr R = 10 km/hr
∴ Requried average speed

$$= \frac{a+b+c}{\frac{a}{P}+\frac{b}{Q}+\frac{c}{R}} = \frac{9+25+30}{\frac{9}{3}+\frac{25}{5}+\frac{30}{10}} = \frac{64}{3+5+3} = \frac{64}{11} = 5\frac{9}{11}\ \text{km/hr}$$

Hence average speed of a person = $5\frac{9}{11}$ km/h

11. (c); Total present age of Pand Q = 15 × 2 + 10 = 40 years.
Total present age of P, Q and R
= 20 × 3 = 60 years. P + Q + R = 60
(Present age) R = 20 years.
R age after 10 years = 20 + 10 = 30 years.

12. (c); Let the total no of non officer staff in an office = x
According to the question
750 × 15 + 250x = 500 (x + 15)
500x – 250x = 11250 – 7500

$$250x = 3750 \Rightarrow x = \frac{3750}{250} = 15$$

Hence no of non-officer staff = 15

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13. (b); Total Present age of family of 5 members
= 27 × 5 + 3 × 5 = 135 + 15 = 150 years
Total present age of a family including child
= 27 × 6 = 162 years
age of a child = 162 – 150 = 12 years.

14. (d); Total age of 5 sisters = 100years.
Total age of a group of sister at the birth of youngest sister = 100 – 4 × 5 = 80 years.

Average age of group of sisters $\frac{80}{4}$ = 20 years.

15. (b); Sum of the weight of A, B, C and D = 67 × 4 = 268 kg
Sum of the weight of A, B, C, D, E = 65 × 5 = 325 kg
weight of E = 325 – 268 = 57 kg
Weight of F = 57 + 4 = 61 kg
Total weight of F, B, C, D, E = 64 × 5 = 320 kg
Total weight of B, C, D, E = 320 – 61 = 259 kg.
∴ Weight of A = 325 – 259 = 66 kg.

Shortcut:
Weight of E = (67 – 2) – (4 × 2) = 57 Weight of F = 61 kg
Average weight decreases by 1 kg on replacing A.
So, weight of A = 61 + 5 × 1 = 66 kg

16. (a); Total of a + b + c = 33, c + d + e = 51
e + f = 44, e + c = 34, d = 51 – 34 = 17
∴ a + b + c + d + e + f = 33 + 17 + 44 = 94

Average of a, b, c, d, e, f = $\frac{94}{6} = 15\frac{2}{3}$

17. (a); Total age of a man and his twin born son
= 30 × 3 = 90 years
given the ratio of father and his twin son
= 5 : 2 : 2

Father's age = $\frac{90}{9} \times 5$ = 50 years

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18. (c); Total age of Rakesh and Mohan = 30 years
Mohan + Ramesh = 24 years
Rakesh + Ramesh = 26 years

(Rakesh + Mohan + Ramesh) = $\frac{80}{2}$ = 40 years.

age of Mohan = 40 – 26 = 14 years.

19. (a); Let the second number = x

$$\frac{x}{2} + x + 2x = 84 \Rightarrow \frac{x + 2x + 4x}{2} = 84$$

$$7x = 84 \times 2 \Rightarrow x = \frac{84 \times 2}{7} \Rightarrow x = 24$$

Third number = 24 × 2 = 48

20. (a); Total temp of Mon + tues + wed = 111°C
tues + wed + thus = 34 × 3 = 102°C
Mon – Thus = 9°C

$$M - \frac{4}{5} M = 9°C \Rightarrow \frac{M}{5} = 9°C \Rightarrow M = 45\ °C$$

Temp on thursday = $45 \times \frac{4}{5}$ = 36°C

21. (b); let the number of non–officer staff in the office = x
15 × 460 + x × 110 = (x + 15) 120
120x – 110x = 6900 – 1800 10x = 5100 ⇒ x = 510
No of non–officer staff in the office = 510

22. (a); Let the number of candidates who passed = x
According to question
55 × x + 25 (150 – x) = 150 × 50
55x – 25x = 7500 – 3750 = 3750/30 ⇒ x = 125
Hence no of candidate who passed the exam
= 125

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23. (b); Total age of 24 boys and teacher = (24 +1) × 15 = 375 years

Total age of all boys excluding teacher

= 24 × (15 – 1) = 336 years.

age of teacher = 375 – 336 = 39 years

Shortcut:

Age of teacher = 15 + 24 × 1 = 39 years

24. (a); Total age of 8 members = 8 × 40 = 320 years.

Total age after replacement of 1 member

= 320 – 55 + 39 = 304 years.

New average = $\frac{304}{8}$ = 38 years

Hence average decreased by 2 years.

Shortcut:

Difference in ages = 55 – 39 = 16 years its effect $= \frac{16}{8} = 2$

25. (c); Sum of the age of 2 new players

$= 18 + 20 + 11 \times \frac{2}{12} = 38 + \frac{22}{12} = \frac{478}{12}$ years

average age of 2 new players

$= \frac{478}{12 \times 2} = \frac{478}{24} = 19\frac{22}{24}$ = 19 years 11 months.

26. (a); Let the number of students = x

According to the question

x × 6 + 12 × 40 = (x + 12) 7

6x + 480 = 7x + 84 ⇒ x = 396

27. (a); Let the average of 11 innings = x

Total run of 11 innings = 11x

After 12 innings

11x + 90 = (x – 5)12 ⇒ 12x – 11x = 90 + 60 ⇒ x = 150

Average after 12th innings = 150 – 5 = 145

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Shortcut:

Average after 12 innings = (90 + 12 × 5) – 5 = 145

28. (a); Let the no of wicket taken by the cricketer = x

According to the question

$$\frac{12.4 \times x + 26}{x + 5} = 12 \Rightarrow 12.4x + 26 = 12x + 60$$

$$x = \frac{34}{4} = \frac{340}{4} = 85$$

29. (c); Let his score in 26th inning = x

According to the question

25 × 56 + x = 26 (56 + 2)

x = 1308 – 1400 ⇒ x = 108

Shortcut:

Score in the 26th innings = 56 + 2 – 26 = 108

30. (a); Let the age of a class teacher = x

According to question

30 × 13.5 + x = 14 × 31 ⇒ x = 434 – 405= 29 years

Shortcut:

Age of the teacher = 14 + 0.5 × 30 = 29 years

31. (a); Let the marks of New student = x

x = 90 – 20 × 4 ⇒ x = 80

Marks of New student = 10

32. (a); Sum of Age of x and y = 40 years

y and z = 38 years, Z and X = 42 years

$$x + y + z = \frac{40 + 38 + 42}{2} = \frac{120}{2} = 60$$

x = 60 – 38 = 22 years, y = 60 – 42 = 18 years

z = 60 – 40 = 20 years

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33. (a); Total age of a family of 6 members = 22 × 6 = 132 years
Total age of the family at birth of youngest member
= 132 – 7 × 6 = 132 – 42 = 90 years.

Average age = $\frac{90}{5}$ = 18 years.

34. (b); Age of a new man = 25 + 10 × 2 = 45 years.

35. (a); Total correct marks obtained by students
= 100 × 60 – 75 + 65 = 5990

mean marks of 100 students = $\frac{5990}{100}$ = 59.9

Shortcut:

The actual marks are 10 less then the previous marks.

So, correct mean $= 60 - \left(\frac{10}{100}\right) = 59.9$

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36. (c); Let the consecutives even numebr
= x, x + 2, x + 4, x + 6

∴ x + x + 2 + x + 4 + x + 6 = 260
4x = 248 ⇒ x = 62
A × D = 62 × 68 = 4216

37. (c); Total correct weight of 36 students
= 50 × 36 – 73 + 3 = 1800 – 36 = 1764 kg.

Correct average = $\frac{1764}{36}$ = 49 kg.

Shortcut:

Correct average $= 50 - \left(\frac{73-37}{36}\right) = 49$ kg

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38. (c); Sachin score in 26th innings.

$= 26 \times (46 + 2) - 25 \times 46 \quad = 1248 - 1150 = 98$

Shortcut:

Sachin's score in 26th innings $= 46 + 2 \times 26 = 98$

39. (a); total present age of 5 members $= 17 \times 5 + 3 \times 5 = 100$

total present age including new baby $= 17 \times 6 = 102$

Age of new baby $= 102 - 100 = 2$ years.

40. (b); Total sum of all the 5 subjects $= 75 \times 4 + 80 = 380$

$$\text{Average} = \frac{380}{5} = 76$$

Shortcut:

$$\text{New average} = 75 + \left(\frac{80-75}{5}\right) = 76 \text{ marks}$$

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Difficult

1. (b); Total weight of A + B + C $= 84 \times 3 = 252$ kgs

A + B + C + D $= 80 \times 4 = 320$ kgs.

D = 68, E = 68 + 3 = 71 kgs

B + C + D + E $= 79 \times 4 = 316$ kg

B + C + D $= 316 - 71 = 245$ kg

A $= 320 - 245 = 75$ kgs.

2. (a); Total runs of 42 innings $= 42 \times 30 = 1260$

Total run excluding min and max inning

$= 40 \times 28 = 1120$

max + min $= 1260 - 1120 = 140$ ...(i)

max – min = 100 ...(ii)

On solving (i) & (ii)

max = 120, min = 20

Hence, minimum score is 20.

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3. (b); Sum of the present age of Husband and wife

$= 23 \times 2 + 5 \times 2 = 56$ years

Sum of the present age of Husband, wife and child

$= 20 \times 3 = 60$

Age of child $= 60 - 56 = 4$ years.

4. (b); Present age of Husband and wife $= 25 \times 2 + 7 \times 2 = 64$ years

Present age of Husband wife and child

$= 22 \times 3 = 66$ years

Age of a child is $= 66 - 64 = 2$ years.

5. (a); Sum of the present age of Mother, Father and Son

$= 42 \times 3 + 6 \times 3 = 126 + 18 = 144$ years.

Sum of present age of the family $= 36 \times 5 = 180$

Present age of the bride $= 180 - 144 - 5 = 31$ years.

Age of the bride at the time of marriage

$= 31 - 6 = 25$ years.

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6. (a); Let the average expenditure of a man = x Rs.

$\therefore$ According to the question

$\therefore$ $35 \times x + 42 = 42(x - 1)$

$\therefore$ $7x = 84 \Rightarrow x = 12$ Rs.

Original expenditure $= 35 \times 12 = 420$ Rs.

7. (d); Ashish total earnings of 11 months

$= 4200 \times 11 = 46{,}200\$$

Total earnings to be needed for 12 months

$= 5000 \times 12 = 60{,}000\$$

Last month earnings $= 60{,}000 - 46{,}200 = 13{,}800\$$

Shortcut:

Required earning in the last month

$= 5000 + (5000 - 4200) \times 11 = \$\ 13800$

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8. (a); Let the three no is x, y, z

$x : y \Rightarrow (2 : 3) \times 5$

$y : z \Rightarrow (5 : 8) \times 3 \Rightarrow x : y : z = 10 : 15 : 24$

Second number y = $\frac{15}{49} \times 98 = 30$

9. (a); Let the total number of workers = x

$\therefore$ $15 \times 525 + (x - 15)\, 85 = x \times 95$

$\therefore$ $15 \times 525 - 15 \times 85 = 10x$

$\therefore$ $7875 - 1275 = 10x \Rightarrow 10x = 6600 \Rightarrow x = 660$

10. (d); Let his Avg be A

And increased average = A + x

$86A + 270 = 87\,(A + x) \Rightarrow x = \frac{(270 - A)}{87}$

if x be a whole number possible value of A

A = 9, 96, 183, 270 for x = 3, 2, 1, 0

So new value = 12, 98, 184, 270

11. (e); Let the Average expenditure of the party is x

$\therefore 13 \times 79 + 6(x + 4) = 19 \times x$

$13x = 13 \times 79 + 24 \Rightarrow x = \frac{1027 + 24}{13} = 80.84$

Total expenditure of the party = 80.84 × 19 = 1536.07

12. (b); Let the person initially going for picnic is x

$\therefore$ $16.75 \times x + 20 \times 13.25 = 15\,(x + 20)$

$1.75x = 15 \times 20 - 20 \times 13.25$

$1.75x = 35 \Rightarrow x = 20$

13. (c); Let the total no of faculty = x

and management trainees = y

$4000x + 1250y = (x + y)2000$

$8x = 3y \Rightarrow x : y = 3 : 8$

So the possible value could be = 110

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14 (a); 10 years ago average age of 25 teachers = 45 years.
4 years ago (just before the retirement of principal) average age of 25 teachers = 45 + 6 = 51
and at the same time total age of 25 teachers = 51 × 25 = 1275
and the total age of remaining 24 teachers when just principal has retired = 1275 – 60 = 1215 years
1 year later (i.e. 3 years ago from present)
total age of 25 teacher (just before the recruitment of new principal) = 1215 + (1 × 24) = 1239 years.
and the total age of 24 teacher including new principal just after the recuitment = 1239 + 54 = 1293 years.
Thus the present age of all the 25 teachers
= 1293 + 3 × 25 = 1368 years.
Hence the present average age of the 25 teacher.

$$= \frac{1368}{25} = 54\frac{18}{25} \text{ years.}$$

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15. (a); Sum of six lightest weight players = 49 × 6 = 294 kgs.
sum of six heaviest players weight = 52 × 6 = 312 kg
∴ weight of the player at 6th position = 312 + 294 – 550 = 56 kg.

16. (a); Total age of S + G = 35 × 2 = 70 years
K + G = 32 × 2 = 64 years S + K = 38 × 2 = 76 years

$$S + G + K = \frac{70+64+76}{2} = \frac{210}{2} = 105 \text{ years}$$

$$\text{Average of } S + G + K = \frac{105}{3} = 35 \text{ years}$$

$$D + I = \frac{35}{2} \Rightarrow \text{ Sum of age of } D + I = 35$$

$$\text{Average of } S, G, K, D, I = \frac{105+35}{5} = 28 \text{ years}$$

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17. (c); Total present age of a family of 6 members

$= 25 \times 6 + 4 \times 6 = 174$

Total present age of a family including child $= 25 \times 7 = 175$ years.

Age of child is $= 175 - 174 = 1$ year.

18. (a); Total expenditure of Jan to June $= 4200 \times 6$

= Rs. 25200

Total expenditure from Feb to July

$= 25200 - 1200 + 1500 =$ Rs. 25500

$$\text{Average} = \frac{25500}{6} = \text{Rs. } 4250$$

19. (a); The price of the costliest and cheapest computers

$=(80 \times 30{,}000) - (78 \times 29{,}500) = 99{,}000$

Therefore the price of cheapest computer

$= 99{,}000 - 80{,}000 = 19{,}000$

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20. (a);

	No. of family member	Average	Total
Eleven years Earlier	4	28	112
Presently	if 4	39	156
	6	28	168

Since it is obvious that the youngest member (i.e. child) was the 6th family member in the family. Therefore at the time of the birth of the youngest child the elder child's age was 6 years.

Now the sum of their ages

Let age of the youngest member = x

$x + x + 6 = (168 - 156) \Rightarrow 2x + 6 = 12 \Rightarrow x = 3$

Then the present age of the youngest member of the familly is = 3 years.

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21. (c); let the average of walking = x km/hr

Total distance = 32 × 3 = 96

$$\therefore \quad \frac{6}{x}+\frac{90}{60}=3, \qquad \therefore \frac{6}{x}+\frac{3}{2}=3$$

$$\frac{12+3x}{2x}=3 \quad \Rightarrow \quad 3x=12 \quad \Rightarrow \quad x=4 \text{ km/hr.}$$

22. (a); Let the average of prime number be P and average of composit number be C.

Again the number of prime number be x,

then the number of composite number be 2x

$$\frac{Px+2Cx}{3x}=9 \quad \Rightarrow \quad P+2C=27$$

$$\frac{2Px+Cx}{3x}=11 \quad \Rightarrow \quad 2P+C=33$$

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On adding eq. (i) and (ii)

we get P + C = 20

and on Subtracting eq. (i) from (ii)

we get P – C = 6

Therefore P = 13 and C = 7 $\Rightarrow$ thus = $\frac{C}{P}=\frac{7}{13}$

23. (c); Let the number of subjects be n and average marks be x, the total marks = nx

Again (n + 1) (x – 1) = (nx – 40) + (23 + 25) x – n = 9 ...(i)

Further (n + 2) (x + 1) = (nx – 40) + (23 + 25) + 57

nx + 2x + n + 2 = nx + 65 2x + n = 63 ...(ii)

Solving equation I and II we get

n = 15 $\Rightarrow$ x = 24

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24. (a); Let Donald be denoted by H (Husband)
His wife be denoted by W, His daughter be denoted by D, His son be denoted by S
The average age of 4 persons

$$= \frac{H+W+D+S}{4} = 23$$

$H + W + D + S = 92 \Rightarrow H = W + 4$

	H		W	D	S
At the time when daughter is born →	28	$\xleftarrow{(+4)}$	24	0	×
↓					
At the time when Son is born →	32	$\xleftarrow{(-4)}$	28	4	0

So at the time of birth of his Son, total age of his family = 64 years. (32 + 28 + 4 + 0 = 64) and presently the total age of his family = 92 years.
It means total increase in age of the whole family = 28 years.

Thus average increase in age $= \frac{28}{4} = 7$ years.

It means the age of Donald = 39 years
and age of his daughter = 11 years
Therefore the average age of Donald and his Daughter is 25 years.

25. (b); let the number be (a – 5), (a – 3), (a – 1), (a + 1) (a + 3) (a + 5)
Then the average of all six consecutive odd no.

$$= \frac{(a-5)+(a-3)+(a-1)+(a+1)+(a+3)+(a+5)}{6} = a$$

The value of 'a' can be found by using the last statement
$(a-5)^2 + (a+5)^2 = 178 \Rightarrow a^2 = 64$ a = 8
Average of all six number is 8.

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26. (a);

	No of Directors	Average Age	Total age
Just before death and resignation	10	48	480
Just after death and resignation	9		(480 - (53 + x) + 34
one year later	9	46	414

So one year later, after the incident

total age = {480 – (53 + x) + 34} + 9 × 1 = 414 x = 56

where x is the age of the dead person at the time of his death.

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