EXERCISE

1. In a coconut grove, (x+2) trees yield 60 nuts per year, x trees yield 120 nuts per year and (x – 2) trees yield 180 nuts per year. If the average yield per tree be 100, then x is
   (a) 3 (b) 4
   (c) 5 (d) 6
2. Out of 40 boys in a class, average weight of 30 is 60 kg and the average weight of the remaining is 56 kg. The average weight (in kilogram) of the whole class is
   (a) 58.5 (b) 58
   (c) 57 (d) 59
3. A school has 4 section of Chemistry in Class X having 40, 35, 45 and 42 students. The mean marks obtained in Chemistry test are 50, 60.55 and 45 respectively for the 4 sections. Determine the overall average of marks per student
   (a) 50.25 (b) 52.25
   (c) 5 1.25 (d) 53.25
4. The average of 20 numbers is zero. Of them, at the most, how may be greater than zero?
   (a) 0 (b) 1
   (c) 10 (d) 19
5. The average of six numbers is 3.95. The average of two of them is 3.4, while the average of the other two is 3.85. What is the average of the remaining two numbers?
   (a) 4.5 (b) 4.6
   (c) 4.7 (d) 4.8
6. Nine persons went to a hotel for taking their meals. Eight of them spent ₹12 each on their meals and the ninth spend ₹8 more than the average expenditure of all the nine. What was the total money spent by them?
   (a) 115 (b) 117
   (c) 119 (d) 122
7. The average age of A and B is 20 years. If C were to replace A, the average would be 19 and if C were to replace B, the average woule be 21. What are the age of A, B, and C?
   (a) 22,18,20 (b) 20,20,18
   (c) 18,22,20 (d) None of these
8. 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) 1year (b) 2 years
   (c) $1\frac{1}{2}$ year (d) cannot be determined
9. The average age of a group of persons going for picnic is 16 years. Twenty new persons with an average age of 15 years join the group on the spot due to which their average becomes 15.5 years. Find the number of persons initially going for picnic.
   (a) 20 (b) 18
   (c) 22 (d) None of these
10. The average age of 36 students in a group is 14 years. When teacher's age is included to it, the average increase by one. What is the teacher's age in years?
    (a) 31 (b) 36
    (c) 51 (d) cannot be determined
11. A batsman in his 12th innings makes a score of 65 and thereby increases his average by 2 runs. What is his average after the 12th innings if he had never been 'not out'?
    (a) 42 (b) 43

(c) 44 (d) 45

12. A pupil's marks were wrongly entered as 83 instead of 63. Due to that the average marks for the class got increased by half. The number of pupils in the class is:
(a) 10 (b) 20
(c) 40 (d) 73

13. In the first 10 over's of a cricket game, the run rate was only 3.2. What should be the run rate in the remaining 40 over's to reach a target of 282 runs?
(a) 625 (b) 6.50
(c) 6.75 (d) 7.00

14. The average number of printing error per page in a book of 512 pages is 4. If the total number of printing error in the first 302 pages is 1,208, the average number of printing errors per page in the remaining pages is
(a) 0 (b) 4
(c) 840 (d) 90

15. The average attendance in a school for the first 4 days of the week is 30 and for the first 5 days of the week is 32. The attendance on the fifth day is
(a) 32 (b) 40
(c) 38 (a) 36

16. The average expenditure of a labourer for 6 months was ₹85 and the fell into debt. In the next 4 months by reducing his monthly expenses to ₹60 her not only cleared off his debt but also saved ₹30. His monthly income is
(a) ₹70 (b) ₹72
(c) ₹75 (d) ₹78

17. The average of a batsman for 40 innings is 50 runs. His highest score exceeds his lowest score by 172 runs. If these two innings are excluded, his average drops by runs. Find his highest score.
(a) 172 (b) 173
(c) 174 (d) 175

18. Last years, a Home Appliance Store sold an average (arithmetic mean) of 42 microwave ovens per month. In the first 10 months of this year, the store has sold an average (arithmetic mean) of only 20, microwave ovens per month. What was the average number of microwave ovens sold per month during the entire 22 months period?
(a) 21 (b) 30
(c) 31 (d) 32

19. The captain of a cricket team of 11 players is 25 years old and the wicket-keeper is 3 years older. If the age of these two players are replaced by that of another two players, the average of the cricket team drops by 2 years. Find the average age of these two players
(a) 15 years (b) 15.5 years
(c) 17 years (d) 16.5 years

20. A batsman makes a score or 87 runs in the 17th innings and thus increases his average by 3. Find his average after 17th inning.
(a) 36 (b) 39
(c) 42 (d) 45

21. Nine men went to a hotel. 8 of then spent Rs 3 each over their meals and the ninth spent Rs 2 more than the average expenditure of all the nine. The total money spent by all them was
(a) Rs 26 (b) Rs 40
(c) Rs 29.25 (c) Rs 27

22. A cricketer whose bowling average is 12.4 runs per wicket takes 5 wickets for 26 runs and thereby decreases his average by 0.4. The number of wickets taken by him till the last match was:
(a) 64 (b) 72
(c) 80 (d) 85

23. In an examination, a pupil's average marks were 63 per paper. If he had obtained 20 more marks for his

Geography paper and 2 more marks for his History paper, his average per paper would have been 65. How many papers were there in the examination?
(a) 8 (b) 9
(c) 10 (d) 11

24. A car owner buys petrol at Rs 7.50, Rs 8.00 and Rs 8.50 per litter for three successive years. What approximately is his average cost per liter of petrol if he spends Rs 4000 each year?
(a) Rs 8 (b) Rs 9
(c) Rs 7.98 (c) Rs 8.50

25. A batsman has scored an average of 46 runs for a certain number of innings played in England. When he came back to India, he played another two test matches of two innings each and scored at an average of 55 runs. For the innings in England and in India taken together, he has improved his average by 2 runs over the matches played England. Find the number of innings played in England.
(a) 12 (b) 13
(c) 14 (d) 15

26. There were 35 students in a hostel. Due to the admission of 7 new students, the expenses of mess were increased by Rs 42 per day while the average expenditure per head diminished by Rs 1. What was the original expenditure of the mess?
(a) Rs 400 (b) Rs 420
(c) Rs 445 (c) Rs 465

27. A family consists of grandparents, parents and three grandchildren. The average age of the grandparents is 67 years, that of the parents is 35 years and that of the grandchildren is 6 years. What is the average age of he family?
(a) $28\frac{4}{7}$ years (b) $31\frac{5}{7}$ years
(c) $32\frac{1}{7}$ years (d) None of these

28. The average of two numbers is XY. If one number is X, then the other number is
(a) Y (b) $\frac{Y}{2}$
(b) 2XY – X (c) X (Y – 1)

29. In Arun's opinion, his weight is greater than 65 kg but less than 72 kg. His brother does not agree with Arun and he thinks that Arum's weight is greater than 60 kg but less than 70 kg. His mother's view is that is weight cannot be greater than 68 kg. If all of them are correct in their estimation, what is the average of different probable weights of Arum?
(a) 67 kg (b) 68 kg
(c) 69 kg (d) None of these

30. The average age of a board of 8 functional directors in a company is the same as it was 3years ago, a younger man having been substituted for one of the directors. How much younger was the new man than the director whose place he took.
(a) 24 years (b) 26 years
(c) 28 years (d) None of these

31. The average weight of 45 students in a class is 52 kg. 5 of them whose average weight is 48 kg leave the class and other 5 student whose average weight is 54 kg join the class. What is the new average weight (in kg) of the class?
(a) 52.6 (b) $52\frac{2}{3}$
(c) $52\frac{1}{3}$ (d) None of these

32. The average of 10 numbers is 40.2. Later it is found that two numbers have been wrongly copied. The first is 18 greater than the actual number and the second number added is 13 instead of 31. Find the correct average.
(a) 40.2 (b) 40.4
(c) 40.6 (d) 40.8

33. There are 50 boys in a class. Their average weight is 45 kg. When one boy leaves the class, the average reduces by 100 g. Find the weight of the boy who left the class.
(a) 40.9 kg (b) 42.9 kg
(c) 49.9 kg (d) 39.9 kg

34. The average monthly sales for the first eleven months of the year of a certain salesman were Rs 12000, but due to his illness during the last month, the average monthly sales for the whole year come down to Rs 11375. What was the value of sales during the last month?
(a) 2100 (b) 875
(c) 700 (d) 4500

35. The average mark of a class of n students is 64. When eight new students with an average mark of 73 join in the class, the new average of the entire class is a whole number. Find the number of students now in the class, given that n lines between 25 and 60.
(a) 36 (b) 28
(c) 54 (d) 72

36. The average temperature for Monday, Tuesday and Wednesday was 55°, the average for Tuesday, Wednesday and Thursday was 60°, that for Thursday being 56°, what was the temperature on Monday?
(a) 39° (b) 41°
(c) 45° (d) None of these

37. If a, b, c, d, e are five consecutive odd numbers, then the average in terms of 'a' will be-
(a) a + 2 (b) a + 3 (c) a + 4 (d) a

38. In preparing a meal for 4 people, a house wife uses 600 grams of sprouts, 1 kg of potatoes, 1 cauliflower weighing 1/2 kg each and 700 grams of meat. If one quarter of the weight is lost in preparation and cooking, then what is the average weight in grams, of each person's meal:
(a) 2100 (b) 875 (c) 700 (d) 525

39. Visitor to show were charged Rs15.00 each on the first day, Rs 7.50 on the second, Rs 2.50 on the third day and total attendance on the three days were in the ratio of 2:5:13, respectively. Find the average charge per person for the whole show.
(a) Rs 5 (b) Rs 7 (c) Rs 9 (d) Rs 11

40. The average weight of a group of 75 girls was calculated as 47kgs. It was later discovered that the weight of one of the girls was read as 45 kg. Whereas her actual weight was 25 kg. What is the actual average weight of the group of 75 girls?
(a) 4.6 kg (b) 46.73kg
(c) 47.83 kg (c) 45.93 kg

41. The mean grad of a section of 20 students is 66% and that of another section of 15 students is 70% what is combined mean grade.
(a) 66.7% (b) 67.7% (c) 68.7% (d) 69.7%

42. The average age of a team of 15 employees is 36. The youngest of them is 20 years old and the eldest is 56 years old. Two of them with average age 28 leave the team. If one of the two comes back on the condition that he will be made the team leader then which of the following can possible by the average age of the new team so formed?
(a) 35 (b) 36 (c) 38 (d) 39

43. On a journey across Kolkata, a taxi averages speed is 40 kmph for 60% of distance, 30 kmph for 20% of the distance, and 10 kmph for the remainder. The average speed of the whole journey is
(a) 25 km/h (b) 26 km/h
(c) 24 km/h (c) 30 km/h

44. A man travels a journey with average speed of 40 km/h and return back with average speed of 3o km/h. Find his overall average speed.
(a) 35km/h (b) 40 km/h
(c) 30km/h (d) 17.14 km/h

45. The respective ratio between the speed of a car, a train and a bus is 5:9:4. The average speed of the car the bus and the train is 72km/h together. What is the average speed of the car and the train together?
(a) 82 km/h (b) 78km/h
(c) 84km/h (d) cannot be determined

46. The table given below has question-wise data on the performance of students in an examination. The marks for each question are also listed. There is no negative or partial marking in the examination

Q.No	Marks	Answered correctly	Answered wrongly	Not attempted
1	2	21	17	6
2	3	15	27	2
3	2	23	18	3

what is the average of the marks obtained by the class in the examination?
a) 1.34 b) 1.74 c) 3.02 4) 3.91

47. The average age of boys in the class is twice the number of girls in the class. The ration of boys and girls in the class of 50 is 4:1. The total of the ages (in years) of the boys in the class is
(a) 2000 (b) 2500
(c) 800 (d) 400

48. There are 100 students in 3 sections A, B and C of a class. The average mark of all the 3 sections was 84. The average and B and C was 87.5 and the average marks of A is 70. The number of students in A was
(a) 30 (b) 35
(c) 20 (d) 25

49. The average of 5 consecutive numbers is n. If the next two numbers are also included, the average of the 7 numbers will
(a) increase by 2 (b) increase by 1
(c) Remain the same (d) increase by 1.4

50. On a journey across Kolkata, a taxi averages 40 kmph for 60% of distance, 30 kmph for 20% of the distance, and 10 kmph for the remainder. The average speed of the whole journey is
(a) 25 kmph (b) 26 kmph
(c) 24 kmph (d) 30 kmph

ANSWER KEYS				
1.(b)	2.(d)	3.(b)	4.(d)	5.(b)
6.(b)	7. (a)	8. (b)	9. (a)	10. (c)
11. (b)	12. (c)	13. (a)	14. (b)	15. (b)
16. (d)	17. (c)	18. (d)	19. (b)	20. (b)
21. (c)	22. (d)	23. (d)	24. (c)	25. (c)
26. (b)	27. (b)	28. (c)	29. (d)	30. (a)
31. (b)	32. (a)	33. (c)	34. (d)	35. (a)
36. (b)	37. (c)	38. (d)	39. (a)	40. (b)
41. (b)	42. (b)	43. (c)	44. (d)	45. (c)
46. (c)	47. (c)	48. (c)	49. (b)	50. (c)

HINTS & EXPLANATIONS

1. (b) $\frac{(x+2)\times60+x\times120+(x-2)\times180}{(x+2)+x+(x-2)}=100$

$\Rightarrow \frac{360x-24}{3x}=100$

$\Rightarrow 60x=240=x=4$

2. (d) Average weight of 30 = 60 kg

⇒ Sum of weight of 30 boys = 1800

Average weight of 10 = 56 kg

⇒ Sum of weight of 10 boys = 560

$= \frac{\text{Sum of weight of all boys}}{40}$

$= \frac{\text{Sum of weight of 30 boys} + \text{Sum of weight of 10 boys}}{40}$

$= \frac{60\times30+56\times10}{40}$ = 59 kg

3. (b) Required average marks

$= \frac{40\times50+35\times60+45\times55+42\times45}{40+35+45+42}$

$= \frac{2000+2100+2475+1890}{162}$

$= \frac{8465}{162}=52.25$

4. (d) Average of 20 numbers = 0.

∴ Sum of 20 number = (0 × 20) = 0.

It is quite possible that 19 of these numbers may be positive and if their sum is a, then 20th numbers is (-a),

5. (b) Sum of the remaining two numbers.

$= (3.95\times6)-[(3.4\times2)+3.85\times2$

$=23.70-(6.8\times7.7)$

$=23.70-14.5$

$=9.20$

∴ Required average = $\left(\frac{9.2}{2}\right)=4.6.$

6. (b) Let the average expenditure of all the nine be Rs. x. Then, 12 x 8 + (x + 8) = 9x or 8x = 104 or x = 13.

∴ Total money spent = 9x = Rs. (9 x 13) = Rs. 117.

7. (a) Given A + B = 40 … (i)

C + B = 38 … (ii)

A + C = 42 … (iii)

(i) + (ii) + (iii) ⇒ $A+B+C=60$…(iv)

from (i) and (iv), we get C = 20 years

∴ B = 18 years and A = 22 years

8. (b) Sum of present ages of the six members

= (17 x 6) year = 102 years.

Sum of present ages of the 5 members (excluding baby)

= 5 x (17+3) years = 100 years.

∴ Age of the baby = 102 – 100 = 2 years

9. (a) Let the number of persons, initially going for Picnic = x

∴ Sum of their ages = 16x

Also, $\frac{16x+15\times20}{x+20}=15.5$

⇒ 0.5x = 10 ⇒ $x=20$

10. (c) Age of the teacher =$(37\times15-36\times14$ years = 51 years.

11. (b) Let 'x' be the average score after 12th innings ⇒ $12x=11\times(x-2)+65$

$\therefore x=43$

12. (c) Let there be x pupils in the class

Total increase in marks = $\left(x\times\frac{1}{2}\right)=\frac{x}{2}$

$\therefore \frac{x}{2}=(83-63)\Rightarrow\frac{x}{2}=20\Rightarrow x=40$

13. Total runs in the first 10 over's

$=10\times3.2=32$

Run rate required in the remaining 40 over's

$=\frac{282-32}{40}=\frac{250}{40}=6.25$ runs per over

14. (b) Remaining pages = 512 – 302 = 210

Let average printing error in remaining page x = x,

Then, $\frac{1208+210\times x}{512} = 4$

$\Rightarrow 210x = 840 \Rightarrow x = 4$

15. (b) Attendance on the fifth day = $32 \times 5 - 30 \times 4$

$= 160 - 120 = 40$

16. (d) Income of 6 months = Rs $(6 \times 85 -$debt

$= Rs\ 510 -$debt

Income of the man for next 4 months

= Rs $4 \times 60 +$debt + Rs 30

= Rs 270 + debt

∴ Income of 10 months = Rs 780

Average monthly income = Rs 780 ÷ 10= Rs 78

17. (c) Total runs = 40 x 50 = 2000

Let his highest score be = x

Then his lowest score = x – 72

Now $\frac{2000-x-(x-172)}{38} = 48$

$\Rightarrow 2x = 2172 - 1824$

$\Rightarrow x = 174$

18. (d) $\frac{42\times12+20\times10}{12+10} = \frac{504+200}{22} = \frac{704}{22} = 32$

19. (b) Let average of team = x years

Then, 25 + 28 + S_9 = 11x … (i)

where S_9 is the sum of ages of remaining players

Also, Np+S_9 = 11 (x – 2), …(ii)

where Np is the sum of ages of new players

(i) – (ii) $\Rightarrow 53 - Np = 22$

$\Rightarrow Np = 31$

∴ Average age of new two players $= \frac{31}{2} = 15.5$ years

20. (b) Let the average after 17th inning = x.

Then, average after 16th inning = (x – 3).

∴ $16(x-3) + 87 = 17x$ or x = (87 – 48) = 39.

21. (c) Let the average expenditure of all the nine be Rs x Then, 3 x 8 + x + 2 = 9x

$\Rightarrow 3.25$

∴ Total money spent = 9x = 9 x 3.25 = 29.25

22. (d) Let the number of wickets taken till the last match be x. Then,

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

$\Rightarrow 0.4x = 34 \Rightarrow x = \frac{34}{0.4} = \frac{340}{4} = 85$

23. (d) Let the number of papers by x. Then, 63x + 20 + 2 = 65x or 2x = 22 or x = 11.

24. (c) Let average cost of petrol per liter be Rs x

Then x = $\frac{1200}{\frac{4000}{7.5}+\frac{4000}{8}+\frac{4000}{8.5}}$

$= \frac{3}{\frac{2}{15}+\frac{1}{8}+\frac{2}{17}} = \frac{6120}{767} = Rs\ 7.98$ per litre

25. (c) Let the number of innings played in England be x.

∴ Total runs scored in England = 46x

∴ Total runs scored for innings played in India

= 55 x 4 220

(∵ the number of innings played in India = 4)

Also, $\frac{46x+220}{x+4} = 48$

$\Rightarrow 46x + 220 = 48x + 192$

$\Rightarrow 2x = 28 \Rightarrow x = 14$

26. (b) Le the original average expenditure be Rs x. Then, 42 (x – 1) – 35x = $42 \Leftrightarrow 7x = 84 \Rightarrow x = 12.$

∴ Original expenditure = Rs (35 x 12) = Rs 420

27. (b) Required average = $\left(\frac{67\times2+35\times2+6\times3}{2+2+3}\right)$

$= \left(\frac{134+70+18}{7}\right) = \frac{222}{7}$

$= 31\frac{5}{7}$ years.

28. (c) Let the other number be N.
Then, $\frac{X+N}{2} = XY \Rightarrow N = 2XY - X$

29. (d) Let Arun's weight be X kg.
According to Arun, 65 < X < 72.
According to Arun's brother , 60 < X < 70.
According to Arun's mother, X < 68.
The values satisfying all the above conditions are 66 and 67.

$\therefore Required\ average = \left(\frac{66+67}{2}\right)$

$= \left(\frac{133}{2}\right) = 66.5kg$

30. (a) Let the new man was younger than the director = x years and 3 years age, the sum of ages of board of directors
= S – 8 x 3 = S – 24
Then, 3 years age, average age of board of directors

$$\frac{s-24}{8}$$

Now, $\frac{s-24}{8} = \frac{s-x}{8}$

$\Rightarrow x = 24\ years$

Shortcut method: if the new young director would have been not substituted ,,then total age would have increased at present by 8×3=24 years.
Therefore, the new man is 24 years younger keeping the average at present same as 3 years ago.

31. (b) Total weight of 45 students
$= 45 \times 52 = 2340\ kg$
Total weight of 5 students who leave
$= 5 \times 48 = 240kg$
Total weight of 5 students who join
$= 5 \times 54 = 270kg$

Therefore, new total weight of 45 students
= 2340 – 240 + 270 = 2370
⇒ New average weight = $\frac{2370}{45} = 52\frac{2}{3}kg$

32. (a) Sum of 10 numbers = 402
Corrected sum of 10 numbers
= 402 – 13 + 31 – 18 = 402
Hence, new average = $\frac{402}{10} = 40.2$

33. (c) Here one boy is excluded and final average of the group decreases.
∴ change in average is (-)ve= -0.1kg
Using the formula
Sum of the quantities excluded

$= \begin{pmatrix} Change\ in\ no.of\ quantities \\ \times \\ Original\ average \end{pmatrix} + \begin{pmatrix} Change\ in\ average \\ \times \\ Final\ no.of\ quantities \end{pmatrix}$

⇒ weight of the boy who left
$= (1 \times 45) — (-0.1 \times 49)$
$= 49.9$ kg
∴ weight of the boy who left the class is 49.9 kg.

34. (d) Total sales for the first eleven months
$= 12{,}000 \times 11 = Rs\ 132000$
Total sales for the whole year = Rs 11375 x 12
= Rs 136500
∴ Value of sales during the last month
= 136500 – 132000 = Rs 4500.

35. (a) Let 'x' be the increase in the average

$$\frac{64n + 8 \times 73}{n+8} = 64 + x$$

$$\Rightarrow x = \frac{(73-64)8}{n+8} \Rightarrow x = \frac{9 \times 8}{n+8}$$

For 'x' to be a whole number 72 (= 9 x 8) should be divisible by (n + 8)

From the choices it can be said that 36 and 72 are two such factors. But 72 does not lie within the range.
∴ number of students in class are 36.

36. (b) Sum of temp, for Monday, Tuesday and Wednesday
= 55 x 3 = 165°
Sum of temp, for Tuesday, Wednesday, an Thursday
= 60 x 3 = 180°
Since temp, on Thursday = 56°
⇒ Temp for Tue and Wed = 180 – 56 = 124°
⇒ Temp of Monday = 165 – 124 = 41°

37. (c) If you assume the first number to be a, naturally next number would be 2 more than a and so on
⇒ The number are; a, a+2, a+4, a+6, a+8.
Hence, their average = Sum/5 = (a + 4)

38. (d) Sprouts 600 gms + Potatoes 1000 gms + Cauliflower 500 gms + Meat 700 gms = 2800 gms.
Hence total cooked food = 2100 gms and is served among 4 people.
Thus average weight is 525 gs.

39. (a) Let attendance on first, second, and third day be 2, 5 and 13 respectively.
Total attendance of three days= 2+ 5 + 13 = 20
Total money collected = $2 \times 15 + 5 \times 7.50 + 13 + 2.50$
$= 30 + 37.5 + 32.5 = 100$
Average per person = $\frac{100}{20} = 5$

40. (b) Total actual weight of all girls = 47 x 75 – 45 + 25 = 3505 kg
Avg weight = $\frac{3505}{75} = 46.73.kg$

41. (b) $\frac{20\times66+15\times70}{20+15} = 67.7\ \%$

42. (b) Total age = 15 x 36
After the two left, total age $=15 \times 36 - 2 \times 28$
$= 540 - 56 = 484\ years.$
Let the age of the person who returns be x years.
The new average = $\frac{484+x}{14}$
Now x lies between 20 and 36 (both inclusive)
∴ New average min
$\frac{484+20}{14} = \frac{520}{14} = 36$ Years.
And new average
Max = $\frac{484+36}{14} = \frac{520}{14} = 37.14$ years.

43. (c) Average speed = $\frac{Total\ Distance}{Total\ time}$
Let total distance is D km
Time taken for 60% of distance = $\frac{D\times0.6}{40}$ hour
Time taken for 20 % distance = $\frac{D\times0.2}{30}$ hour
Time taken for 20 % distance = $\frac{D\times0.2}{10}$ hour
∴ Average speed
$$= \frac{D}{\frac{D\ \times\ 0.6}{40} + \frac{D\ \times\ 0.6}{30} + \frac{D\ \times\ 0.2}{10}}$$
$$= 24km/h$$

44. (d) Average speed = $\frac{total\ distance\ travalled}{total\ time\ taken}$
$$= \frac{D+D}{\frac{D}{40}+\frac{D}{30}} = 17.14km/h$$

45. (c) Total speed of car, bus, train=72×3=216 km
Total speed of car, bus and train = $\frac{5+9}{5+9+4} \times 216 = \frac{168km}{h}$
Average = $\frac{168}{2} = 84\ km/h$

46. (c) Total marks obtained

$= (21 \times 2) + (15 \times 3) + (23 \times 2)$
$= 133$
Total number of students = 21 + 17 + 6 = 44
$\therefore$ Average $= \frac{133}{44} = 3.02$

47. (c) Number of boys = $\frac{4}{5} \times 50 = 40$
Number of girls = $\frac{1}{5} \times 50 = 10$
Average of boys = $2\times 20 = 40$
Total age of the boys = $40 \times 20 = 800$

48. (c) Total marks of all three sections = $84 \times 100 = 8400$
total marks of (B + C) = 87.5 $(n_2 + n_3)$
total marks of A = 70 n_1
$n_1 + n_2 + n_3 = 100$ … (1)
$70n_1 + 87.5n_2 + 87.5n_3 = 8400$ ..... (2)
Multiplying equation (1) by 87.5 and substract from equation (2)
We get $17.5n_1 = 350$
$n_1 = 20$

49. (d) Let the numbers be n-2, n – 1, n, n + 1 and n + 2. Their average = n.
Next two consecutive numbers are n +3 and n + 4.
Therefore the average of 7 consecutive number

$$= \frac{(n-2)+(n-1)+n+(n+1)+(n+2)+(n+3)+(n+4)}{7}$$

$$= \frac{5n+2n+7}{7} = n + 1$$

Hence, the average of 7 numbers will increase by 1.

50. (c) Let total distance be d.
time taken for 60 % distance $\frac{0.6d}{40} = \frac{3d}{200}h$
time taken for 20 % distance $\frac{0.2d}{30} = \frac{d}{150}h$
time taken for remaining 20% distance
$= \frac{0.2d}{10} = \frac{d}{50}h$

Average speed $= \frac{d}{\frac{3d}{200}+\frac{d}{150}+\frac{d}{50}}$

$$= \frac{200 \times 150 \times 50}{22500 + 10000 + 30000}$$
$$= \frac{200 \times 150 \times 50}{62500}$$
$$= 24kmph$$