(Talent & Olympiad Question)

Arithmetic

Multiple Choice Questions

1. A How is 89% written?

(a) $\dfrac{89}{100}$ (b) $\dfrac{98}{100}$

(c) 8.9   (d) $8\dfrac{9}{100}$

2. What is the decimal for 79%?

(a) 7.9   (b) 0.79

(c) 79.00   (d) 1.79

3. What is the missing number?

0.97 is equal to_____%

(a) 9.7   (b) 9.71

(c) 97   (d) 0.97

4. Which of the following is 75% of 35kg?

(a) 2625 kg   (b) 26.25 kg

(c) 262.5 kg   (d) 2.625 kg

5. Observe the following.

10% of Rs. 100 ___ 50% of Rs. 10

Which symbol must be placed in the box?

(a) <   (b) =

(c) >   (d) Either (a) or (b)

6. 10% of plants in a garden are pink rose plants, 30% are red rose plants, 40% are white rose plants and the remaining are jasmine plants. If there are 400 plants in the garden, how many jasmine plants are there in the garden?

(a) 320   (b) 80

(c) 400   (d) 160

7. Sudha scored 312 out of 450 marks. What is her percentage marks?

(a) 69%   (b) 69.4%

(c) 69.33%   (d) 69.5%

8. If 6 squares out of 32 are coloured on a board, what is the percentage of coloured squares?

(a) 1875%   (b) 1.875%

(c) 187.5%   (d) 18.75%

9. Rohan's mother gave him Rs.300, out of which he spent 15% on stationery, 35% on eatables and saved the remaining amount. How much did Rohan save?

(a) Rs.200   (b) Rs.100

(c) Rs.150   (d) Rs.50

10. What percent of the squares on a chess board are black?

(a) 50%   (b) 60%

(c) 15%   (d) 75%

11. In a school there were 125 teachers out of whom 15 were maths teachers. Find the percentage of maths teachers.

(a) 12%   (b) 14%

(c) 15%   (d) 25%

12. Prashanth invests 65% in machinery, 20% in raw material and still has Rs.1305 cash with him. Find his total investment.

(a) Rs.8500   (b) Rs.8700

(c) Rs.6800   (d) Rs.9600

13. If 37.5% of a number is 450, what is 87.5% of the same number?

(a) 825   (b) 1175

(c) 1050   (d) 1250

14. What percent of $270\ kg$ is $108\ kg$?

(a) 40%   (b) 36%

(c) 30%   (d) 25%

15. Two numbers are respectively 20% and 50% more than the third number. What $\%$ is the first number of the second?

(a) 40%   (b) 50%

(c) 80%   (d) 70%

16. The salary of a man increased by 20%. If his new salary is $Rs.3000$, what was his salary before the increase?

(a) $Rs.2000$ (b) $Rs.2300$

(c) $Rs.2400$ (d) $Rs.2500$

17. The average age of 6 students is 11 years. If two more students of ages 14 years and 16 years join, what will their average age be?

(a) $13\ years$ (b) $12\ years$

(c) $12\frac{1}{2}\ years$ (d) $11\frac{1}{2}\ years$

18. The average temperature of the first three days of a week is $27^\circ C$ and that of the next three days is $29^\circ C$. If the weekly average is $28.5^\circ C$, what is the temperature on the last day?

(a) $31.5^\circ C$

(b) $28^\circ C$

(c) $21^\circ C$

(d) $42^\circ C$

19. What is the average of 5, 0, 6, $\frac{1}{4}$ and $8\frac{3}{4}$?

(a) 1   (b) 2

(c) 3   (d) 4

20. What is the ratio of $Rs.3$ and 60 paise?

(a) $1:20$ (b) $5:1$

(c) $1:2$ (d) $20:1$

21. In a class there are 50 boys and 3 girls. What is the ratio of number 30 boys to number of girls in the class

(a) $80:50$ (b) $3:5$

(c) $5:3$ (d) $50:80$

22. What is the ratio of $0.12\ kg$ and $180\ g$?

(a) $0.01:1.8$ (b) $1:15$

(c) $2:3$ (d) $3:2$

23. If $Rs.60$ is divided into two parts in the ratio $2:3$, what is the difference between those two parts?

(a) $Rs.10$ (b) $Rs.12$

(c) $Rs.5$ (d) $Rs.14$

24. Mala and Bala got 75 marks and 25 marks respectively in an examination. Find the ratio of the marks scored by Mala to the total marks obtained by both of them.

(a) $3:4$ (b) $3:1$

(c) $1:3$ (d) $4:3$

25. The ratio of the heights of A and B is $4:3$. If B is $1.2\ m$ tall, find the height of A.

(a) $0.9\ m$ (b) $1.8\ m$

(c) $1.6\ m$ (d) $1.7\ m$

26. If a car travels $150\ km$ in 5 hours, what is its speed?

(a) $150\ km/h$ (b) $30\ km/h$

(c) $50\ km/h$ (d) $10\ km/h$

27. A student has to reach his school in 15 minutes. If the school is 800 metres away, at what speed should he walk?

(a) $\dfrac{800}{15}m/s$ (b) $\dfrac{1}{15}m/s$

(c) $\dfrac{8}{9}m/s$ (d) $\dfrac{1}{9}m/s$

28. A car travels at $45\ km$ per hour. How much time will it take to cover $90\ km$?

(a) $1\ hour$ (b) $2\ hours$

(c) $3\ hours$ (d) $10\ hours$

29. A cycle travels at a speed of $45\ km/h$. How far will it travel in 36 minutes?

(a) $27\ km$ (b) $20\ km$

(c) $36\ km$ (d) $45\ km$

30. A boy runs at a speed of $8\ m/s$. How long does he take to cover a distance of $1\ km$?

(a) $100\ sec$

(b) $125\ sec$

(c) $12.5\ hr$

(d) $150\ sec$

31. If the sum of $Rs.415$ amounts to 450, what is the interest earned?

(a) $Rs.25$ (b) $Rs.35$

(c) $Rs.45$ (d) $Rs.50$

32. If amount is $Rs.500$ and interest is $Rs.100$, find the principal.

(a) $Rs.100$ (b) $Rs.400$

(c) $Rs.600$ (d) $Rs.200$

33. At what rate percent per annum does a sum of $Rs.1800$ become $Rs.2700$ in 10 years?

(a) 5% (b) 6%

(c) 10% (d) 8%

34. There are 100 questions on Manu's test. She has completed 40 of the questions. What percent of the questions has Manu completed?

(a) 0.4% (b) 4%

(c) 40% (d) 400%

35. Raju bought a pen for $Rs.5$ and sold it to Krishna for $Rs.10$. What is his gain percentage?

(a) 25% (b) 50%

(c) 100% (d) 200%

36. The average mark of Raju in 5 tests is 70. How many marks did he get in total?

(a) 350 (b) 300

(c) 35 (d) 250

(37-40): There are 15 blue marbles and 9 red ones in a bottle.

37. What is the ratio of number of red marbles to the total number of marbles?

(a) $5:3$ (b) $3:8$

(c) $3:5$ (d) $5:13$

38. What is the ratio of number of blue marbles to the total number of marbles?

(a) $5:3$ (b) $3:8$

(c) $5:8$ (d) $3:5$

39. What percent of the marbles is blue?

(a) $62\frac{1}{2}\%$ (b) 75%

(c) $65\frac{1}{2}\%$ (d) $37\frac{1}{2}\%$

40. What is the decimal equivalent of percentage of red marbles?

(a) 0.573   (b) 0.375

(c) 0.357   (d) 0.625

41. 30% of a number is 24. What is $1\frac{1}{2}$ times the number?

(a) 36

(b) 45

(c) 100

(d) 120

42. What is the difference between 25% of 50 and 250% of 20?

(a) 12.5   (b) 5

(c) 37.5   (d) 255.5

43. What is 15% of $1\frac{1}{3}h$?

(a) 10 min   (b) 16 min

(c) 22 min   (d) 12 min

44. The average between X and Y is 108. Y is 300% the value of X. Find the difference between X and Y.

(a) 108

(b) 54

(c) 36

(d) 144

45. Of the 42 children at a party, 12 are boys and the rest are girls. Identify the simplest form of the ratio of number of girls to number of boys.

(a) $2:5$ (b) $5:2$

(c) $5:7$ (d) $2:3$

46. If $\square:3$ has the same value as $12:36$, what is the missing number in the box?

(a) 2   (b) 1

(c) 4   (d) 12

47. The average of 6 numbers is 12. What is the total of the 6 numbers?

(a) 60   (b) 18

(c) 72   (d) 6

(48-51): The table shows the number of pupils who borrowed books from the school library in a week.

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
No. of Pupils	48	32	59	43	82	120

Study the table and answer Q. 48 to Q. 51.

48. Find the average number of pupils who borrowed books per day.

(a) 62 *pupils*   (b) 65 *pupils*

(c) 66 *pupils*   (d) 64 *pupils*

49. Find the difference between the greatest and the least number of pupils who borrowed books for the week.

(a) 88   (b) 80

(c) 60   (d) 68

50. What is the ratio of number of pupils who borrowed books on Friday and Saturday?

(a) $21:12$

(b) $21:30$

(c) $41:30$

(d) $41:60$

51. What percent of the total number of pupils borrowed books on Tuesday?

(a) $5\dfrac{3}{8}\%$

(b) $8\dfrac{1}{3}\%$

(c) $8\dfrac{1}{6}\%$

(d) $8\dfrac{2}{3}\%$

52. Madhu had $Rs.248$. He spent 25% of it on a shirt. How much had he left?

(a) $Rs.71$

(b) $Rs.203$

(c) $Rs.81$

(d) $Rs.186$

53. Mr. Kumar earns $Rs.1000$ a day. His wife earns $Rs.250$ less. What is the ratio of the daily earnings of Mr. Kumar and his wife?

(a) $4:7$

(b) $3:4$

(c) $4:3$

(d) $3:7$

54. What is 20% of 3 kg 400 g?

(a) 680 g

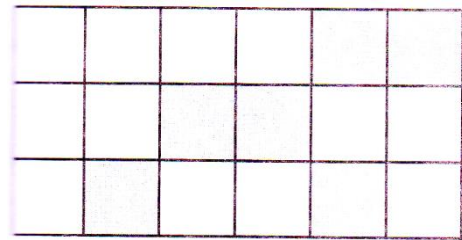(b) 1368 g

(c) 3 kg 420 g

(d) 2 kg 720 g

55. There are 90 pages in a book. Venu read 30% of it in one hour. How many pages of the book did he read within that hour?

(a) 33

(b) 27

(c) 36

(d) 30

56. 28% of the total number of pupils in a school can swim. If the enrolment of the school is 1050, how many pupils cannot swim?

(a) 804

(b) 758

(c) 756

(d) 812

57. Observe the figure.

What is the ratio of the number of shaded squares to the total number of squares?

(a) $1:4$

(b) $1:3$

(c) $2:5$

(d) $2:3$

58. It $P+Q=105$ and $P-Q=45$, what is $P:Q$?

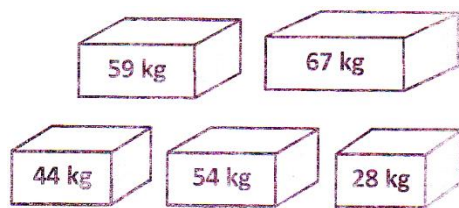(a) $1:5$

(b) $2:5$

(c) $3:5$

(d) $5:2$

59. What is 0.1% equal to?

(a) $\dfrac{1}{10}$

(b) $\dfrac{1}{100}$

(c) $\dfrac{1}{1000}$

(d) $\dfrac{1}{10000}$

60. Srujan answered 38 out of 50 questions correctly. What percentage of the questions were answered incorrect?

(a) 24%

(b) 12%

(c) 38%

(d) 76%

61. Observe the wooden blocks.

What is the average mass of the given wooden blocks?

(a) 63 *kg*   (b) 50.4 *kg*

(c) 252 *kg*   (d) 56.5 *kg*

Answers with Explanation

1. (a) $89\% = \dfrac{89}{100}$

2. (b) $79\% = \dfrac{79}{100} = 0.79$

3. (c) $0.97 = \dfrac{97}{100} = 97\%$

4. (b) 75% of 35 kg

$= \dfrac{75}{100} \times 35$ $kg = 26.25$ kg

5. (c) 10% of $Rs.\ 100 = Rs.10$

50% of $Rs.\ 10 = Rs.\ 5$

Since $Rs.\ 10 > Rs.\ 5$, of 10% of $Rs.\ 100 > 50\%$ of $Rs.\ 10$.

6. (b) Total number of plants in the garden $= 400$

Percentage of jasmine plants $= 100\%$ − Sum of % different coloured of rose plants

$= 100\% - (10 + 30 + 40)\%$

$= 100\% - 80\% = 20\%$

Thus, 20% of 400 plants are jasmine plants.

The number of jasmine plants

$= 20\% \times 400 = 80$

7. (c) Total marks $= 450$

Marks scored $= 312$

∴ % of marks scored

$= \dfrac{312}{450} \times 100\% = 69.33\%$

8. (d) 6 squares out of 32 are coloured.

∴ The required percentage

$= \dfrac{6}{32} \times 100\% = 18.75\%$

9. (c) Amount given by Rohan's mother $= Rs.\ 300$

% of money spent on stationery and eatables

$= 15\% + 35\% = 50\%$

The % of amount saved

$=$ Remaining $\% = (100 - 50)\% = 50\%$

∴ Amount saved by Rohan

$= 50\%$ of $Rs.\ 300$

$= \dfrac{50}{100} \times Rs.\ 300 = Rs.\ 150$

10. (a) A chess board has $8 \times 8 = 64$ squares of which 32 are black.

Hence, the percentage of black squares

$= \dfrac{32}{64} \times 100\% = 50\%$

11. (a) Percentage of maths teachers

No. of maths teachers

$= \dfrac{\text{No. of maths teachers}}{\text{Total no. of teachers}} \times 100\%$

$= \dfrac{15}{125} \times 100\% = 12\%$

12. (b) Cash remaining with Prashanth

$= [100\% - (65 + 20)\%]$ of total investment

$= 15\%$ of total investment

∴ $Rs.\ 1305 = \dfrac{15}{100} \times$ total investment

Hence, the total investment

$= Rs.\ 1305 \times \dfrac{100}{15} = Rs.\ 8700$

13. (c) 37.5% of a number = 450

$$\therefore \text{Number} = \frac{450 \times 100}{37.5} = 1200$$

$\therefore$ 87.5% of the same number

$$= \frac{87.5}{100} \times 1200$$

$$= 87.5 \times 12 = 1050$$

14. (a) The required percentage

$$= \frac{108}{270} \times 100\% = 40\%$$

15. (c) Let the third number be 100.

$$\text{Required} \% = \frac{120 \times 100}{150} = 80\%$$

16. (d) Increased salary of the man

$= 120\%$ of his salary before increase

$\therefore$ His salary before increase

$$= \text{Increased salary} \times \frac{100}{120}$$

$$= Rs.\ 3000 \times \frac{100}{120} = Rs.\ 2500$$

17. (b) $\text{Average} = \dfrac{66 + 14 + 16}{8} \text{ years}$

$$= 12 \text{ years}$$

18. (a) $28.5 \times 7 - 27 \times 3 - 29 \times 3 = 31.5°C$

19. (d) $\dfrac{5 + 0 + 6 + \frac{1}{4} + 8\frac{3}{4}}{5} = \dfrac{20}{5} = 4$

20. (b) The required ratio is

$Rs.\ 3.60$ p

$= 300\ p : 60\ p$ (Since $Rs.\ 1 = 100\ p$)

$= 5 : 1$

21. (c) $50 : 30 = 5 : 3$

22. (c) $0.12\ kg : 180\ g$

$= 120\ g : 180\ g = 2 : 3$

23. (b) $60 \times \dfrac{2}{5} = Rs.\ 24$

$$60 \times \frac{3}{5} = Rs.\ 36$$

$\text{Difference} = Rs.(36 - 24) = Rs.\ 12$

24. (a) Total marks $= 75 + 25 = 100$

Required ratio $= 75 : 100 = 3 : 4$

25. (c) Height of $A = \dfrac{4}{3} \times$ Height of B

$$= \frac{4}{3} \times 1.2\ m = 1.6\ m$$

26. (b) $\text{Speed} = \dfrac{\text{Distance}}{\text{Time}} = \dfrac{150 \text{ km}}{5 \text{ h}}$

$$= 30\ km/hr$$

27. (c) Distance $= 800\ m$

Time $= 15 \text{ min} = 15 \times 60 \text{ seconds}$

$\text{Speed} = \dfrac{800}{15 \times 60} = \dfrac{8}{9} m/s$

28. (b) $\text{Time} = \dfrac{\text{Distance}}{\text{Speed}} = \dfrac{90}{45} = 2 \text{ hours}$

29. (a) Speed $= 45\ km/h$

Time $= 36 \text{ minutes} = \dfrac{36}{60} hr$

Distance $=$ Speed $\times$ Time

$$= 45 \times \frac{36}{60} = 27\ km$$

30. (b) Distance $= 1\,km = 1000\,m$

Speed $= 8\,m/s$

$\text{Time} = \dfrac{\text{Distance}}{\text{Speed}}$

$\qquad = \dfrac{1000}{8} = 125\ \text{sec}$

31. (b) Amount $(A) = Rs.\ 450$

Principal $(P) = Rs.\ 415$

$I = A - P = Rs.(450 - 415) = Rs.\ 35$

32. (b) $P = A - I \qquad = Rs.(500 - 100)$

$\qquad\qquad\qquad = Rs.\ 400$

33. (a) $P = Rs.\ 1800$, $\qquad A = Rs.\ 2700$

$T = 10$ years

$I = A - P = Rs.(2700 - 1800) = Rs.\ 900$

$R = \dfrac{100 \times I}{P \times T} = \dfrac{100 \times 900}{1800 \times 10} = 5\%$

34. (c) No. of questions in Manu's test $= 100$

No. of questions she completed $= 40$

∴ Percentage of questions completed

$\qquad = \dfrac{40}{100} \times 100\% = 40\%$

35. (c) Gain $=$ S.P. $-$ C.P. $= Rs.(10 - 5) = Rs.\ 5$

$\qquad = \dfrac{Gain}{C.P.} \times 100\%$

$\qquad = \dfrac{5}{5} \times 100\% = 100\%$

36. (a) $\text{Average} = \dfrac{\text{Total marks}}{\text{Number of tests}}$

$\Rightarrow 70 = \dfrac{\text{Total marks}}{5}$

∴ Total marks $= 350$

37. (a) The required ratio

(No. of red marbles) : (Total no. of marbles)

$= 9 : (15 + 9)$

$= 9 : 24 = 3 : 8$

38. (c) The required ratio $=$

(No. of blue marbles) : (Total no. of marbles)

$= 15 : (15 + 9)$

$= 15 : 24 = 5 : 8$

39. (a) No. of blue marbles $= 15$

Total number of marbles $= 24$

∴ Percentage of blue marbles

$= \dfrac{15}{24} \times 100\% = 62\dfrac{1}{2}\%$

40. (b) Percentage of red marbles

$=$ No. of marbles

Total no. of marbles

$= \dfrac{9}{24} \times 100\% = 37\dfrac{1}{2}\%$

The required decimal equivalent $= 37.5\%$

$= \dfrac{37.5}{100} = 0.375$

41. (d) 30% of a number $= 24$

$1\dfrac{1}{2}$ times a number

$= 150\%$ of the number

$= \dfrac{24}{30} \times 150 = 120$

42. (c) 25% of $50 = \dfrac{25}{100} \times 50 = 12.5$

250% of $20 = \dfrac{250}{100} \times 20 = 50$

∴ The required difference

$= 50 - 12.5 = 37.5$

43. (d) $1\frac{1}{3}h = 60\ \text{min} + \frac{1}{3} \times 60\ \text{min}$

$\qquad = (60 + 20)\text{min} = 80\ \text{min}$

$15\% \text{ of } 1\frac{1}{3}h = 15\% \text{ of } 80\ \text{min}$

$\qquad = \frac{15}{100} \times 80\ \text{min} = 12\ \text{min}$

44. (a) The average of X and $Y = 108$

$\Rightarrow X + Y = 108 \times 2 = 216 \rightarrow (1)$

$300\% X = Y$ i.e., $Y = 3X$

$X + Y = 216$

$\Rightarrow X + 3X = 216$

$\Rightarrow 4X = 216$

$\Rightarrow X = \frac{216}{4} = 54$

The required difference

$= Y - X = 3X - X$

$= 2X = 2 \times 54 = 108$

45. (b) No. of girls $= 42 - 12 = 30$

$\therefore$ The ratio of number of girls to no. of boys

$= 30 : 12 = 5 : 2.$

46. (b) __ : 3 = 12 : 36

$= 1 : 3$

$\therefore$ The missing number is 1.

47. (c) Average $= \dfrac{\text{Sum of quantities}}{\text{Number of quantities}}$

Sum of the quantities

$= \text{Average} \times \text{No. of quantities}$

$= 12 \times 6 = 72$

48. (d)

49. (a)

50. (d)

51. (b)

52. (d) Amount left with Madhu

$= (100 - 25)\% \text{ of } Rs.\ 248$

$= 75\% \text{ of } Rs.248 = Rs.\ 186$

53. (c) Earnings of Mrs. Kumar

$= Rs.(1000 - 250) = Rs.750$

$\therefore$ Ratio $= 1000 : 750 = 4 : 3$

54. (a) 20% of $3\ kg\ 400\ g$

$\qquad = \frac{20}{100} \times 3400\ g = 680\ g$

55. (b) Number of pages read in that hour = 30% of 90

$\qquad = \frac{30}{100} \times 90 = 27$

56. (c) 28% of 1050 pupils can swim

$\therefore$ No. of pupils who cannot swim

$= (100 - 28)\% \text{ of } 1050$

$= \frac{72}{100} \times 1050 = 756$

57. (b) No. of squares shaded $= 6$

Total number of squares $= 18$

$\therefore$ Their ratio $= 6 : 18 = 1 : 3$

58. (d) $P + Q = 105$

$P - Q = 45$

So, $2P = 105 + 45 = 150$

$\Rightarrow P = 75$

Then, $Q = P - 45 = 75 - 45 = 30$

$\therefore P : Q = 75 : 30 = 5 : 2$

59.   (c) $0.1\% = \dfrac{0.1}{100} = \dfrac{1}{1000}$

60.   (a) No. of questions $= 50$

No. of correct answers $= 38$

No, of incorrect answers $= 12$

$\therefore$ The required percentage of questions answered incorrectly

$= \dfrac{12}{50} \times 100\% = 24\%$

61.   (b) The average mass of the given blocks

$= \dfrac{59 + 67 + 44 + 54 + 28}{5} kg$

$= \dfrac{252}{5} = 50.4 \; kg$

Answers with Explanation

1. (a) $89\% = \dfrac{89}{100}$

2. (b) $79\% = \dfrac{79}{100} = 0.79$

3. (c) $0.97 = \dfrac{97}{100} = 97\%$

4. (b) 75% of $35\ kg$

$$= \frac{75}{100} \times 35\ kg = 26.25\ kg$$

5. (c) 10% of $Rs.\ 100 = Rs.10$

50% of $Rs.\ 10 = Rs.\ 5$

Since $Rs.\ 10 > Rs.\ 5$, of 10% of $Rs.\ 100 > 50\%$ of $Rs.\ 10$.

6. (b) Total number of plants in the garden $= 400$

Percentage of jasmine plants $= 100\% -$ Sum of $\%$ different coloured of rose plants

$= 100\% - (10 + 30 + 40)\%$

$= 100\% - 80\% = 20\%$

Thus, 20% of 400 plants are jasmine plants.

The number of jasmine plants

$= 20\% \times 400 = 80$

7. (c) Total marks $= 450$

Marks scored $= 312$

$\therefore$ % of marks scored

$$= \frac{312}{450} \times 100\% = 69.33\%$$

8. (d) 6 squares out of 32 are coloured.

$\therefore$ The required percentage

9. (c) Amount given by Rohan's mother $= Rs.\ 300$

% of money spent on stationery and eatables

$= 15\% + 35\% = 50\%$

The % of amount saved

$=$ Remaining $\% = (100 - 50)\% = 50\%$

$\therefore$ Amount saved by Rohan

$= 50\%$ of $Rs.\ 300$

$$= \frac{50}{100} \times Rs.\ 300 = Rs.\ 150$$

10. (a) A chess board has $8 \times 8 = 64$ squares of which 32 are black.

Hence, the percentage of black squares

$$= \frac{32}{64} \times 100\% = 50\%$$

11. (a) Percentage of maths teachers

No. of maths teachers

$$= \frac{\text{No. of maths teachers}}{\text{Total no. of teachers}} \times 100\%$$

$$= \frac{15}{125} \times 100\% = 12\%$$

12. (b) Cash remaining with Prashanth

$= [100\% - (65 + 20)\%]$ of total investment

$= 15\%$ of total investment

$\therefore Rs.\ 1305 = \dfrac{15}{100} \times$ total investment

Hence, the total investment

$$= Rs.\ 1305 \times \frac{100}{15} = Rs.\ 8700$$

13. (c) 37.5% of a number $= 450$

$$\therefore \text{Number} = \frac{450 \times 100}{37.5} = 1200$$

$\therefore$ 87.5% of the same number

$$= \frac{87.5}{100} \times 1200$$

$$= 87.5 \times 12 = 1050$$

14. (a) The required percentage

$$= \frac{108}{270} \times 100\% = 40\%$$

15. (c) Let the third number be 100.

$$\text{Required } \% = \frac{120 \times 100}{150} = 80\%$$

16. (d) Increased salary of the man

= 120% of his salary before increase

$\therefore$ His salary before increase

$$= \text{Increased salary} \times \frac{100}{120}$$

$$= Rs.\ 3000 \times \frac{100}{120} = Rs.\ 2500$$

17. (b) $\text{Average} = \dfrac{66 + 14 + 16}{8}$ years

$= 12$ years

18. (a) $28.5 \times 7 - 27 \times 3 - 29 \times 3 = 31.5^{\circ}C$

19. (d) $\dfrac{5 + 0 + 6 + \dfrac{1}{4} + 8\dfrac{3}{4}}{5} = \dfrac{20}{5} = 4$

20. (b) The required ratio is

$Rs.\ 3.60\ p$

$= 300\ p : 60\ p$ (Since $Rs.\ 1 = 100\ p$)

$= 5 : 1$

21. (c) $50 : 30 = 5 : 3$

22. (c) $0.12\ kg : 180\ g$

$= 120\ g : 180\ g = 2 : 3$

23. (b) $60 \times \dfrac{2}{5} = Rs.\ 24$

$60 \times \dfrac{3}{5} = Rs.\ 36$

Difference $= Rs.(36 - 24) = Rs.\ 12$

24. (a) Total marks $= 75 + 25 = 100$

Required ratio $= 75 : 100 = 3 : 4$

25. (c) Height of $A = \dfrac{4}{3} \times$ Height of B

$$= \frac{4}{3} \times 1.2\ m = 1.6\ m$$

26. (b) $\text{Speed} = \dfrac{\text{Distance}}{\text{Time}} = \dfrac{150\ \text{km}}{5\ \text{h}}$

$= 30\ km/hr$

27. (c) Distance $= 800\ m$

Time $= 15$ min $= 15 \times 60$ seconds

$\text{Speed} = \dfrac{800}{15 \times 60} = \dfrac{8}{9} m/s$

28. (b) $\text{Time} = \dfrac{\text{Distance}}{\text{Speed}} = \dfrac{90}{45} = 2$ hours

29. (a) Speed $= 45\ km/h$

Time $= 36$ minutes $= \dfrac{36}{60} hr$

Distance $=$ Speed $\times$ Time

$$= 45 \times \frac{36}{60} = 27\ km$$

30. (b) Distance $= 1\,km = 1000\,m$

Speed $= 8\,m/s$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$= \frac{1000}{8} = 125 \text{ sec}$$

31. (b) Amount $(A) = Rs.\ 450$

Principal $(P) = Rs.\ 415$

$I = A - P = Rs.(450 - 415) = Rs.\ 35$

32. (b) $P = A - I$

$= Rs.(500 - 100)$

$= Rs.\ 400$

33. (a) $P = Rs.\ 1800$, $A = Rs.\ 2700$

$T = 10$ years

$I = A - P = Rs.(2700 - 1800) = Rs.\ 900$

$$R = \frac{100 \times I}{P \times T} = \frac{100 \times 900}{1800 \times 10} = 5\%$$

34. (c) No. of questions in Manu's test $= 100$

No. of questions she completed $= 40$

$\therefore$ Percentage of questions completed

$$= \frac{40}{100} \times 100\% = 40\%$$

35. (c) Gain $=$ S.P. $-$ C.P. $= Rs.(10 - 5) = Rs.\ 5$

$$= \frac{Gain}{C.P.} \times 100\%$$

$$= \frac{5}{5} \times 100\% = 100\%$$

36. (a) Average $= \dfrac{\text{Total marks}}{\text{Number of tests}}$

$$\Rightarrow 70 = \frac{\text{Total marks}}{5}$$

$\therefore$ Total marks $= 350$

37. (a) The required ratio

(No. of red marbles) : (Total no. of marbles)

$= 9 : (15 + 9)$

$= 9 : 24 = 3 : 8$

38. (c) The required ratio $=$

(No. of blue marbles) : (Total no. of marbles)

$= 15 : (15 + 9)$

$= 15 : 24 = 5 : 8$

39. (a) No. of blue marbles $= 15$

Total number of marbles $= 24$

$\therefore$ Percentage of blue marbles

$$= \frac{15}{24} \times 100\% = 62\frac{1}{2}\%$$

40. (b) Percentage of red marbles

$=$ No. of marbles

Total no. of marbles

$$= \frac{9}{24} \times 100\% = 37\frac{1}{2}\%$$

The required decimal equivalent $= 37.5\%$

$$= \frac{37.5}{100} = 0.375$$

41. (d) 30% of a number $= 24$

$1\frac{1}{2}$ times a number

$= 150\%$ of the number

$$= \frac{24}{30} \times 150 = 120$$

42. (c) 25% of $50 = \dfrac{25}{100} \times 50 = 12.5$

250% of $20 = \dfrac{250}{100} \times 20 = 50$

$\therefore$ The required difference

$= 50 - 12.5 = 37.5$

43. (d) $1\dfrac{1}{3}h = 60$ min $+ \dfrac{1}{3} \times 60$ min

$= (60 + 20)$ min $= 80$ min

15% of $1\dfrac{1}{3}h = 15\%$ of 80 min

$= \dfrac{15}{100} \times 80$ min $= 12$ min

44. (a) The average of X and $Y = 108$

$\Rightarrow X + Y = 108 \times 2 = 216 \rightarrow (1)$

$300\%X = Y$ *i.e.*, $Y = 3X$

$X + Y = 216$

$\Rightarrow X + 3X = 216$

$\Rightarrow 4X = 216$

$\Rightarrow X = \dfrac{216}{4} = 54$

The required difference

$= Y - X = 3X - X$

$= 2X = 2 \times 54 = 108$

45. (b) No. of girls $= 42 - 12 = 30$

$\therefore$ The ratio of number of girls to no. of boys

$= 30 : 12 = 5 : 2$.

46. (b) __ $: 3 = 12 : 36$

$= 1 : 3$

$\therefore$ The missing number is 1.

47. (c) Average $= \dfrac{\text{Sum of quantities}}{\text{Number of quantities}}$

Sum of the quantities

$=$ Average $\times$ No. of quantities

$= 12 \times 6 = 72$

48. (d)

49. (a)

50. (d)

51. (b)

52. (d) Amount left with Madhu

$= (100 - 25)\%$ of *Rs.* 248

$= 75\%$ of *Rs.* $248 =$ *Rs.* 186

53. (c) Earnings of Mrs. Kumar

$=$ *Rs.* $(1000 - 250) =$ *Rs.* 750

$\therefore$ Ratio $= 1000 : 750 = 4 : 3$

54. (a) 20% of 3 *kg* 400 *g*

$= \dfrac{20}{100} \times 3400$ *g* $= 680$ *g*

55. (b) Number of pages read in that hour $= 30\%$ of 90

$= \dfrac{30}{100} \times 90 = 27$

56. (c) 28% of 1050 pupils can swim

$\therefore$ No. of pupils who cannot swim

$= (100 - 28)\%$ of 1050

$= \dfrac{72}{100} \times 1050 = 756$

57. (b) No. of squares shaded $= 6$

Total number of squares $= 18$

$\therefore$ Their ratio $= 6 : 18 = 1 : 3$

58. (d) $P + Q = 105$

$P - Q = 45$

So, $2P = 105 + 45 = 150$

$\Rightarrow P = 75$

Then, $Q = P - 45 = 75 - 45 = 30$

$\therefore P : Q = 75 : 30 = 5 : 2$

59. (c) $0.1\% = \dfrac{0.1}{100} = \dfrac{1}{1000}$

60. (a) No. of questions $= 50$

No. of correct answers $= 38$

No, of incorrect answers $= 12$

$\therefore$ The required percentage of questions answered incorrectly

$= \dfrac{12}{50} \times 100\% = 24\%$

61. (b) The average mass of the given blocks

$= \dfrac{59 + 67 + 44 + 54 + 28}{5} kg$

$= \dfrac{252}{5} = 50.4 \ kg$