

RATIO, PROPORTION AND AVERAGE

1. Sachin is younger than Rahul by 4 years. If their ages are in the ratio of 7 ; 9, then how old is Sachin ?
 (a) 14 years (b) 21 years
 (c) 18 years (d) 25 years
[RRB JE 2014 RED SHIFT]
2. Find the average of all prime numbers between 30 and 50 :
 (a) 48 (b) 39
 (c) 39.8 (d) 38
[RRB JE 2014 RED SHIFT]
3. What is 15% of 34 kg ?
 (a) 3.4 kg (b) 3.75 kg
 (c) 4.50 kg (d) 5.10 kg
[RRB JE 2014 RED SHIFT]
4. In an examination, 35% of the students passed and 455 failed. How many students appeared for the examination ?
 (a) 700 (b) 1300
 (c) 845 (d) 1250
[RRB JE 2014 RED SHIFT]
5. The sum of two numbers is 40 and the difference of these two numbers is 4. Find the ratio of these two numbers.
 (a) 11 : 9 (b) 11 : 18
 (c) 22 : 9 (d) 17 : 13
[RRB JE 2014 RED SHIFT]
6. The average age of 5 members of a committee is the same as it was 3 years ago, because an old member has been replaced by a new member. The difference between the ages of old and new member is
 (a) 12 years (b) 4 years
 (c) 8 years (d) 15 years
[RRB JE 2014 YELLOW SHIFT]
7. A bucket contains 2 litres more water when it is filled 80% in comparison when it is filled $66\frac{2}{3}\%$. What is the capacity of the bucket?
 (a) 10 litres (b) 15 litres
 (c) $66\frac{2}{3}$ litres (b) 20 litres
[RRB JE 2014 YELLOW SHIFT]
8. If A exceeds B by 40% and B is less than C by 20%. then A : C = ?
 (a) 3 : 1 (b) 3 : 2
 (c) 26 : 25 (d) 28 : 25
[RRB JE 2014 YELLOW SHIFT]
9. If a : b = 3 : 5 and b : c = 2 : 3, then a : c is
 (a) 3 : 2 (b) 2 : 5
 (c) 5 : 2 (d) 5 : 8
[RRB JE 2015 26th AUG 1st SHIFT]
10. Which of the following numbers are in proportion
 (a) 12, 27, 54, 24 (b) 27, 12, 24, 54
 (c) 12, 27, 24, 54 (d) 54, 24, 12, 27
[RRB JE 2015 26th AUG 1st SHIFT]
11. In two vessels A and B, milk and water are in the ratio of 4 : 3 and 3 : 5 respectively. The ratio in which these are to be mixed to obtain new mixture which contains half milk and half water is
 (a) 7 : 4 (b) 7 : 8
 (c) 1 : 2 (d) 4 : 5
[RRB JE 2015 26th AUG 1st SHIFT]
12. The average of 5 numbers is 40. If one number is excluded then the average becomes 38. The excluded number is
 (a) 48 (b) 58
 (c) 60 (d) 78
[RRB JE 2015 26th AUG 1st SHIFT]
13. The average of 35 observations is 30. Out of these observations the average of first 18 observations is 30 and the last 18 observations is 40. The 18th observation is
 (a) 180 (b) 190
 (c) 200 (d) 210
[RRB JE 2015 26th AUG 1st SHIFT]
14. If a : b = 4 : 5 and b : c = 2 : 3, then c : a is
 (a) 15 : 8 (b) 3 : 4
 (c) 8 : 15 (d) 3 : 5
[RRB JE 2015 26th AUG 2nd SHIFT]
15. If 3, 5, x, 25 are in proportion, then x is equal to
 (a) 5 (b) 10
 (c) 15 (d) 75
[RRB JE 2015 26th AUG 2nd SHIFT]

16. In two vessels A and B, the milk and water are in the ratio of 5 : 2 and 4 : 5 respectively. The ratio in which these are mixed to obtain new mixture which contains milk and water in the ratio 3 : 2 is

- (a) 7 : 6 (b) 49 : 36
(c) 15 : 8 (d) 36 : 49

[RRB JE 2015 26th AUG 2nd SHIFT]

17. The average of first five prime numbers is

- (a) 3.6 (b) 4.5
(c) 5.5 (d) 5.6

[RRB JE 2015 26th AUG 2nd SHIFT]

18. The average weight of 100 students is 46 kg. The average weight of boys is 50 kg. If the number of boys is 60, the average weight of girls in kilograms is

- (a) 35 (b) 40
(c) 45 (d) 50

[RRB JE 2015 26th AUG 2nd SHIFT]

19. If $a : b = 5 : 6$ and $b : c = 3 : 4$, then $c : a$ is

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

[RRB JE 2015 26th AUG 3rd SHIFT]

20. If 8, 12, 14, x are in proportion, then x is equal to

- (a) 18 (b) 20
(c) 21 (d) 28

[RRB JE 2015 26th AUG 3rd SHIFT]

21. In two vessels A and B. the spirit and water are in the ratio of 5 : 2 and 7 : 6 respectively. The ratio in which these are mixed to obtain new mixture which contains spirit and water in the ratio 3 : 2 is

- (a) 5 : 12 (b) 3 : 2
(c) 3 : 2 (d) 7 : 13

[RRB JE 2015 26th AUG 3rd SHIFT]

22. The average of first six even whole numbers is

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

[RRB JE 2015 26th AUG 3rd SHIFT]

23. The average marks of students of section A and B are respectively 60 and 70. The number of students in section A is 47 and in section B is 53. The average marks of both sections taken together are

- (a) 65.5 (b) 65.3
(c) 65.6 (d) 65.8

[RRB JE 2015 26th AUG 3rd SHIFT]

24. If $a : b = 4 : 5$ and $b : c = 2 : 3$, then $c : a$ is

- (a) 15 : 8 (b) 8 : 15
(c) 4 : 5 (d) 3 : 4

[RRB JE 2015 27th AUG 1st SHIFT]

25. If 25, x , 5, 3 are in proportion, then x is equal to

- (a) 5 (b) 15
(c) 75 (d) 125

[RRB JE 2015 27th AUG 1st SHIFT]

26. In two vessels A and B, the milk and water are in the ratio of 3 : 4 and 2 : 3 respectively. The ratio in which these are mixed to obtain new mixture which contains milk and water in the ratio 20 : 29 is

- (a) 6 : 5 (b) 7 : 9
(c) 2 : 5 (d) 3 : 5

[RRB JE 2015 27th AUG 1st SHIFT]

27. The average of first six even whole numbers is

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

[RRB JE 2015 27th AUG 1st SHIFT]

28. The average weight of 100 students is 46 kg. The average weight of girls is 40 kg. If the number of girls is 40, the average weight of boys in kilograms is

- (a) 40 (b) 45
(c) 50 (d) 60

[RRB JE 2015 27th AUG 1st SHIFT]

29. If $a : b = 5 : 12$ and $b : c = 8 : 5$, then $a : c$ is

- (a) 3 : 2 (b) 2 : 3
(c) 1 : 1 (d) 4 : 5

[RRB JE 2015 27th AUG 2nd SHIFT]

30. If 27, 12, 24, x are in proportion, then x is equal to

- (a) 9 (b) 30
(c) 54 (d) 60

For the above question, User had specified 'ignore' during keys upload.

[RRB JE 2015 27th AUG 2nd SHIFT]

31. In two vessels A and B. the spirit and water are in the ratio of 7 : 2 and 5 : 3 respectively. The ratio in which these are mixed to obtain new mixture which contains spirit and water in the ratio 5 : 2 is

- (a) 9 : 8 (b) 8 : 9
(c) 21 : 10 (d) 45 : 32

[RRB JE 2015 27th AUG 2nd SHIFT]

32. The average of squares of first five whole numbers is

- (a) 6 (b) 7.5
(c) 9 (d) 11

[RRB JE 2015 27th AUG 2nd SHIFT]

33. The average of 21 observations is 40. Out of these observations the average of first 11 observations is 38 and the last 11 observations is 41. The 11th observation is

- (a) 19 (b) 20
(c) 29 (d) 39

[RRB JE 2015 27th AUG 2nd SHIFT]

34. If $a : b = 2 : 3$ and $a + b = 45$. then a is equal to

- (a) 27 (b) 25
(c) 18 (d) 9

[RRB JE 2015 27th AUG 3rd SHIFT]

35. If 2, x, x^2 , 4 are in proportion, then x is equal to

- (a) 2 (b) 4
(c) 8 (d) 16

[RRB JE 2015 27th AUG 3rd SHIFT]

36. In two vessels A and B, spirit and water are in the ratio 2 : 1 and 2 : 3 respectively. The ratio in which these are mixed which contains half water is

- (a) 5 : 3 (b) 3 : 5
(c) 2 : 3 (d) 3 : 2

[RRB JE 2015 27th AUG 3rd SHIFT]

37. The average of 4, 6, 0, 3, 6, is

- (a) 4.75 (b) 4.5
(c) 3.8 (d) 3.5

[RRB JE 2015 27th AUG 3rd SHIFT]

38. The average of 20 observations is 18 and average of 30 observations is 25. The average of all 50 observations is

- (a) 21.5 (b) 21.8
(c) 22.2 (d) 22.5

[RRB JE 2015 27th AUG 3rd SHIFT]

39. If $a : b = 4 : 5$ and $a + b = 63$, then a is equal to

- (a) 28 (b) 35
(c) 49 (d) 54

[RRB JE 2015 28th AUG 1st SHIFT]

40. If 3, x, 2x, 50 are in proportion then x is equal to

- (a) 5 (b) 75
(c) $5\sqrt{3}$ (d) $10\sqrt{3}$

[RRB JE 2015 28th AUG 1st SHIFT]

41. In two vessels A and B, spirit and water are in the ratio 5 : 2 and 3 : 4 respectively. The ratio in which these are mixed which contains spirit and water in the ratio 2 : 1 is

- (a) 5 : 2 (b) 2 : 5
(c) 5 : 1 (d) 1 : 5

[RRB JE 2015 28th AUG 1st SHIFT]

42. The average of cubes of first five whole numbers is

- (a) 25 (b) 20
(c) 16 (d) 6

[RRB JE 2015 28th AUG 1st SHIFT]

43. The average of 11 observations is 20. If average of first 6 observations is 18 and average of last 6 observations is 25, the sixth observation is

- (a) 38 (b) 45
(c) 36 (d) 43

[RRB JE 2015 28th AUG 1st SHIFT]

44. If $a : b = 5 : 6$ and $a + b = 220$, then a is equal to

- (a) 100 (b) 120
(c) 130 (d) 140

[RRB JE 2015 28th AUG 2nd SHIFT]

45. If 4, x, 2x, 32 are in proportion, then x is equal to

- (a) $8\sqrt{2}$ (b) 8
(c) 16 (d) $16\sqrt{2}$

[RRB JE 2015 28th AUG 2nd SHIFT]

46. Two vessels A and B, spirit and water are in the ratio 7 : 2 and 7 : 4 respectively. The ratio in which these are mixed which contains spirit and water in the ratio 2 : 1 is

- (a) 3 : 11 (b) 11 : 3
(c) 2 : 7 (d) 7 : 2

[RRB JE 2015 28th AUG 2nd SHIFT]

47. The average of first 5 odd prime numbers is

- (a) 5.4 (b) 5.8
(c) 6.8 (d) 7.8

[RRB JE 2015 28th AUG 2nd SHIFT]

48. The average of 18 observations is 30 and average of 22 observations is 40. The average of all combined observation is

- (a) 35.5 (b) 35
(c) 36 (d) 36.5

[RRB JE 2015 28th AUG 2nd SHIFT]

49. If $a : b = 3 : 7$ and $a + b = 80$, then a is equal to

- (a) 24 (b) 56
(c) 30 (d) 60

[RRB JE 2015 28th AUG 3rd SHIFT]

50. If 8, 3x, 6, 27 are in proportion, then x is equal to
- (a) 6 (b) 9
(c) 12 (d) 15

[RRB JE 2015 28th AUG 3rd SHIFT]

51. In two vessels A and B, the milk and water are in the ratio 5 : 4 and 3 : 5 respectively. The ratio in which these are mixed to obtain new mixture which contains half milk and half water is
- (a) 9 : 4 (b) 4 : 9
(c) 4 : 3 (d) 3 : 4

[RRB JE 2015 28th AUG 3rd SHIFT]

52. The average of first seven whole numbers is
- (a) 8 (b) 7
(c) 6 (d) 3

[RRB JE 2015 28th AUG 3rd SHIFT]

53. The average 16 observations is 25 and average of 24 observations is 30. The average of all 40 observations is
- (a) 26 (b) 27
(c) 27.5 (d) 28

[RRB JE 2015 28th AUG 3rd SHIFT]

54. In an examination, a student secured 30% marks and failed by 42 marks and another student who secured 50% marks, got 42 more marks than the minimum marks to pass. The pass percentage is
- (a) 33 (b) 35
(c) 38 (d) 40

[RRB JE 2015 29th AUG 1st SHIFT]

55. If $A : B = 2 : 3$, $5B = 4C$ and $2C = 5D$, then $A : B : C : D$ is
- (a) 6 : 8 : 12 : 15 (b) 8 : 12 : 15 : 6
(c) 8 : 15 : 12 : 6 (d) 8 : 12 : 6 : 15

[RRB JE 2015 29th AUG 1st SHIFT]

56. Ratio of monthly incomes of A and B is 4 : 3 and that of their expenditures is 3 : 2. If each of them saves Rs 5000 per month, then the sum of monthly incomes of A and B in Rs is
- (a) 21000 (b) 28000
(c) 35000 (d) 42000

[RRB JE 2015 29th AUG 1st SHIFT]

57. Two equal jars are filled with the solutions of spirit and water. In the first jar, the ratio of spirit and water is 5 : 7 and that in the second is 7 : 13. The contents of the jars are then emptied into a single container. The ratio of spirit and water in it is

- (a) 23 : 37 (b) 37 : 23
(c) 35 : 33 (d) 3 : 4

[RRB JE 2015 29th AUG 1st SHIFT]

58. 150 grams of an alloy of copper and zinc contains 60% copper (by weight). The quantity of copper (in grams) must be mixed up with this alloy so as to get another alloy containing 70% copper is
- (a) 60 (b) 55
(c) 50 (d) 45

[RRB JE 2015 29th AUG 1st SHIFT]

59. If the sum of five consecutive positive integers is 40, then the average of first and last integers is
- (a) 6 (b) 8
(c) 9 (d) 10

[RRB JE 2015 29th AUG 1st SHIFT]

60. Five years ago, the average age of A, B and C was 20 years. Four years ago, the average age of A and B was 19 years. C's present age (in years)
- (a) 23 (b) 25
(c) 27 (d) 29

[RRB JE 2015 29th AUG 1st SHIFT]

61. A's income is 10% below C's income and B's income is 20% above C's income. What percent is B's income of A's income.
- (a) 75 (b) $109\frac{1}{11}$
(c) 130 (d) $133\frac{1}{3}$

[RRB JE 2015 29th AUG 2nd SHIFT]

62. If $A : B = 2 : 3$, $7B = 9C$ and $15C = 14D$, then $A : D$ is
- (a) 5 : 4 (b) 4 : 5
(c) 12 : 35 (d) 1 : 7

[RRB JE 2015 29th AUG 2nd SHIFT]

63. The ratio of two numbers is 15 : 13. If each number is increased by 3, then their ratio becomes 8 : 7. The sum of the numbers is
- (a) 28 (b) 42
(c) 56 (d) 84

[RRB JE 2015 29th AUG 2nd SHIFT]

64. In one alloy the ratio of zinc and copper is 2 : 11 whereas in the other one, this ratio is 5 : 21. In what ratio the two be mixed so that the ratio of zinc and copper in the new alloy is 1 : 5?
- (a) 2 : 1 (b) 3 : 2
(c) 4 : 3 (d) 5 : 3

[RRB JE 2015 29th AUG 2nd SHIFT]

65. A jar was full of a mixture containing 40% spirit. A part of this mixture was replaced by another mixture containing 19% spirit. If the percentage of spirit was found to be 26, what part of the jar was replaced by another mixture?

- (a) $\frac{1}{3}$ (b) $\frac{2}{3}$
 (c) $\frac{2}{5}$ (d) $\frac{3}{5}$

[RRB JE 2015 29th AUG 2nd SHIFT]

66. Five years ago, the average age of A and B was 18 years. The average age of A, B, C and D today is 24 years. The average age of D and C after 8 years from today will be

- (a) 21 (b) 29
 (c) 30 (d) 33

[RRB JE 2015 29th AUG 2nd SHIFT]

67. The average of five consecutive odd numbers is 27. The average of first three of them, when arranged in ascending order, is

- (a) 25 (b) 26
 (c) 27 (d) 23

[RRB JE 2015 29th AUG 2nd SHIFT]

68. The tax on a commodity is diminished by 20% and thereby the consumption increase by 25%. The increase or decrease percent in the revenue derived from it is

- (a) 5% decrease
 (b) 5% increase
 (c) 2% increase
 (d) no increase or decrease

[RRB JE 2015 29th AUG 3rd SHIFT]

69. $A : B = \frac{1}{2} : \frac{1}{3}$, $B : C = \frac{1}{4} : \frac{1}{5}$ and $C : D = \frac{1}{6} : \frac{1}{7}$, then A : D is

- (a) 7 : 2 (b) 35 : 16
 (c) 7 : 6 (d) 3 : 2

[RRB JE 2015 29th AUG 3rd SHIFT]

70. The ratio of two numbers is 4 : 3. If each number is increase by 6, then their ratio becomes 5 : 4. The sum of the numbers exceeds their difference by

- (a) 24
 (b) 30
 (c) 36
 (d) 42

[RRB JE 2015 29th AUG 3rd SHIFT]

71. The capacities of two vessels are in the ratio 3 : 5. The first vessel contains acid and water in the ratio 5 : 1 whereas the other one contains acid and water in the ratio of 4 : 1. If the contents of these vessels are emptied into another vessel, the ratio of acid and water in it will be

- (a) 12 : 7 (b) 12 : 5
 (c) 13 : 3 (d) 13 : 5

[RRB JE 2015 29th AUG 3rd SHIFT]

72. A mixture of 180 litres of spirit and water contains 25% water. How much water must be added to it to increase the percentage of water to 40?

- (a) 15 (b) 18
 (c) 20 (d) 45

[RRB JE 2015 29th AUG 3rd SHIFT]

73. Visitors to a show were charged Rs.150 each on the first day, Rs.75 each on the second day and Rs.50 each on the third day. Total attendance on those three days were in the ratio of 3 : 4 : 13, The average charge per person for the whole show was

- (a) Rs.90.16 (b) Rs.80.50
 (c) Rs.75 (d) Rs.70

[RRB JE 2015 29th AUG 3rd SHIFT]

74. The average age of 20 boys and x girls is 11.6 years. The average age of boys is 11 years and that of girls is 12 years. The ratio of the number of girls to that of boys is

- (a) 3 : 2 (a) 2 : 3
 (b) 1 : 2 (c) 2 : 1

[RRB JE 2015 29th AUG 3rd SHIFT]

75. The average of 10 numbers is 7. What will be the new average if each of the numbers is multiplied by 8

- (a) 45 (b) 52
 (c) 56 (d) 55

[RRB JE 2015 30th AUG 3rd SHIFT]

76. The average of three consecutive numbers is n. If the next two consecutive numbers are also included, the average of the five numbers will

- (a) remains the same
 (b) increases by 0.5
 (c) increases by 1
 (d) increases by 1.5

[RRB JE 2015 30th AUG 3rd SHIFT]

77. Divide Rs. 500 among A, B, C and D so that A and B together get thrice as much as C and D together. B get four times of what C gets and C gets 1.5 times as much as D. Now the value of what B gets is

- (a) 300 (b) 75
(c) 125 (d) 150

[RRB JE 2015 30th AUG 3rd SHIFT]

78. If Rs. 58 is divided among 150 children such that each girl and each boy gets 25 p and 50 p respectively. Then how many girls are there.

- (a) 52 (b) 54
(c) 68 (d) 62

[RRB JE 2015 30th AUG 3rd SHIFT]

79. Mr. Alok is worried about the balance of his monthly budget. The price of petrol has increased by 40%. By what percent should he reduce the consumption of petrol so that he is able to balance his budget

- (a) 33.33 (b) 28.56
(c) 25 (d) 40

[RRB JE 2015 30th AUG 3rd SHIFT]

80. Two vessels A and B contains spirit and water mixed in the ratio 5 : 2 and 7 : 6 respectively. Find the ratio in which these mixture be mixed to obtain a new mixture in vessel C containing spirit and water in the ratio 8 : 5

- (a) 4 : 3 (b) 3 : 4
(c) 5 : 6 (d) 7 : 9

[RRB JE 2015 30th AUG 3rd SHIFT]

81. A batsman in his 17th innings makes a score of 85, and thereby increases his average by 3. What is his average after the 17th innings? He had never been 'not out'

- (a) 47 (b) 37
(c) 39 (d) 43

[RRB JE 2015 16th SEP 3rd SHIFT]

82. The sum of three members is 98. If the ratio between first and second is 2 : 3 and that between second and third is 5 : 8, then the second number is

- (a) 30 (b) 20
(c) 58 (d) 48

[RRB JE 2015 16th SEP 3rd SHIFT]

83. Divide Rs. 680 among A, B and C such that A gets $\frac{2}{3}$ of what B gets and B gets $\frac{1}{4}$ th of what C gets. Now the share of C is

- (a) Rs. 480 (b) Rs. 300
(c) Rs. 420 (d) Rs. 360

[RRB JE 2015 16th SEP 3rd SHIFT]

84. The students in three batches at Delhi Public School are in the ratio 2 : 3 : 5. If 20 students are increased in each batch, the ratio change to 4 : 5 : 7. The total number of students in the three batches before the increase were

- (a) 10 (b) 90
(c) 100 (d) 150

[RRB JE 2015 16th SEP 3rd SHIFT]

85. Nakul wanted to subtract 5 from a number. Unfortunately he added 5 instead of subtracting. Find the percentage change in the result.

- (a) 300% (b) 66.66%
(c) 50% (d) Cannot be determined

[RRB JE 2015 16th SEP 3rd SHIFT]

86. Cost of 3 cricket balls = cost of 2 pairs of leg pads. Cost of 3 pairs of leg pads = cost of 2 pairs of gloves. Cost of 3 pairs of gloves = cost of 2 cricket bats. If a cricket bat costs Rs. 54. what is the cost of a cricket ball?

- (a) Rs. 12 (b) Rs. 14
(c) Rs. 16 (d) Rs. 18

[RRB JE 2015 16th SEP 3rd SHIFT]

87. Tea worth Rs. 126/kg and Rs. 135/kg are mixed with a third variety in the ratio 1 : 1 : 2. If the mixture is worth Rs. 153/kg, the price of the third variety/kg will be

- (a) Rs. 169.50 (b) Rs. 170
(c) Rs. 175.50 (d) Rs. 180

[RRB JE 2015 16th SEP 3rd SHIFT]

ANSWERS

- | | | | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (a) | 2. (c) | 3. (d) | 4. (a) | 5. (a) | 6. (d) | 7. (b) | 8. (d) | 9. (b) | 10. (c) |
| 11. (a) | 12. (a) | 13. (d) | 14. (a) | 15. (c) | 16. (b) | 17. (d) | 18. (b) | 19. (c) | 20. (c) |
| 21. (d) | 22. (a) | 23. (b) | 24. (a) | 25. (b) | 26. (c) | 27. (a) | 28. (c) | 29. (b) | 30. (*) |
| 31. (d) | 32. (a) | 33. (c) | 34. (c) | 35. (a) | 36. (b) | 37. (c) | 38. (c) | 39. (a) | 40. (c) |
| 41. (c) | 42. (b) | 43. (a) | 44. (a) | 45. (b) | 46. (a) | 47. (d) | 48. (a) | 49. (a) | 50. (c) |
| 51. (a) | 52. (d) | 53. (d) | 54. (d) | 55. (b) | 56. (c) | 57. (a) | 58. (c) | 59. (b) | 60. (d) |
| 61. (d) | 62. (b) | 63. (d) | 64. (a) | 65. (b) | 66. (d) | 67. (a) | 68. (d) | 69. (b) | 70. (c) |
| 71. (c) | 72. (d) | 73. (d) | 74. (a) | 75. (c) | 76. (c) | 77. (a) | 78. (c) | 79. (b) | 80. (d) |
| 81. (b) | 82. (a) | 83. (a) | 84. (c) | 85. (*) | 86. (c) | 87. (c) | | | |

EXPLANATIONS

1. $S : R = 7X : 9x$
 $\Rightarrow 9x - 7x = 4$
 or $x = 2$
 Hence, S or age of Sachin
 $= 7 \times 2 = 14$ years.
2. Prime numbers between 30 and 50 are:
 31, 37, 41, 43, 47
 \Rightarrow required average

$$= \frac{31 + 37 + 41 + 43 + 47}{5}$$

$$= \frac{199}{5} = 39$$
3. 15% of 34 kg = $\frac{15}{100} \times 34 = 5.10$ kg
4. 65% of x = 455
 $\Rightarrow x = 700$
5. $a + b = 40$ and $a - b = 4$
 $\Rightarrow a = 22$ and $b = 18$
 Hence, $a : b = 11 : 9$
6. Average age of the five members should have been increased by 3 years.
 Hence, required difference = $3 \times 5 = 15$ years.
7. Given:

$$\frac{4}{5}x - \frac{2}{3}x = 2$$

$$\Rightarrow \frac{12x - 10x}{15} = 2$$

$$\Rightarrow x = 15 \text{ litres}$$
8. Let C = 100, such that B = 80 and
 $A = 80 \times 1.4 = 112$
 Hence, $A : C = 112 : 100 = 28 : 25$
9. Given: $a : b = 3 : 5$ and $b : c = 2 : 3$
 $\Rightarrow a : b = 6 : 10$ and $b : c = 10 : 15$
 (making the value of 'b' equal in both the ratios)
 $\Rightarrow a : c = 6 : 15 = 2 : 5$.
10. Among the given options only 12, 27, 24 and 54 are in proportion i.e. $12 : 27 = 24 : 54 = 4 : 9$.
11. Applying allegation for milk we get:

A	B
$\frac{4}{7}$	$\frac{3}{8}$
	$\frac{1}{2}$
$\frac{1}{8}$	$\frac{1}{14}$

Hence, required ratio = $\frac{1}{8} : \frac{1}{14} = 7 : 4$.
12. Let the number be x.
 $\Rightarrow 5 \times 40 = x + 4 \times 38$
 $\Rightarrow x = 48$.
13. Let the 18th observation be x.
 $\Rightarrow 18 \times 30 + 18 \times 40 = 35 \times 30 + x$
 $\Rightarrow x = 210$.
14. $a : b = 4 : 5$ and $b : c = 2 : 3$
 $\Rightarrow a : b = 8 : 10$ and $b : c = 10 : 15$
 $\Rightarrow c : a = 15 : 8$
15. given: $\frac{3}{5} = \frac{x}{25}$
 $\Rightarrow x = 15$
16. Applying allegation for milk we get;

A	B
$\frac{5}{7}$	$\frac{4}{9}$
	$\frac{3}{5}$
$\frac{7}{45}$	$\frac{4}{35}$

= 49 : 36
17. Required average = $\frac{+3 + 5 + 7 + 11}{5} = 5.6$
18. Set the average weight of girls be x kg.
 $\Rightarrow 50 \times 60 + x \times 40 = 100 \times 46$
 $\Rightarrow x = 40$ kg.
19. $a : b = 5 : 6$; $b : c = 3 : 4$
 $= 15 : 18 = 15 : 20$
 $= 18 : 24$
 $\therefore c : a = 24 : 15$
 $= 8 : 5$
20. $8 : 12 :: 14 : x$
 $\Rightarrow \frac{8}{12} = \frac{14}{x} \Rightarrow x = 21$

21. Ratio of spirit and water in vessel A = 3 : 2
Assuming x quantity of liquid, quantity of

$$\text{Spirit in A} = \frac{3x}{5}$$

- Ratio of spirit and water in vessel B = 7 : 6
Assuming Y quantity of liquid, quantity of

$$\text{spirit in B} = \frac{7x}{13}$$

Final ratio of spirit & water = 3 : 2

$$\therefore \frac{3x}{5} + \frac{7x}{13} = \frac{3}{5}(x + y)$$

$$\Rightarrow \frac{x}{y} = \frac{7}{13} = 7 : 13$$

22. First six whole numbers form on AP $\rightarrow 0, 2, 4, \dots$

$$\text{Sum of Ap} = \frac{n}{2}(2a + (n - 1)d) = 30$$

$$= \frac{6}{2}(2 \times 0 + (6 - 1)2) = 30$$

$$\therefore \text{Average} = \frac{30}{6} = 5$$

23. Total marks in Section A = average marks \times numbers of students = $60 \times 47 = 2820$
Similarly, total marks in Section B = $70 \times 53 = 3710$

$$\therefore \text{Average} = \frac{2820 + 3710}{47 + 53} = 65.3$$

24. $a : b = 4 : 5; b : c = 2 : 3$
 $= 8 : 10 \quad = 10 : 15$
 $\therefore a : b : c = 8 : 10 : 15$

$$\therefore c : a = 15 : 8$$

25. $25 : x :: 5 : 3$

$$\Rightarrow \frac{25}{x} = \frac{5}{3} \Rightarrow x = 15$$

26. Let quantity of vessel A = x and of B = y
Vessel A : \therefore ratio of milk & water is 3 : 4,

$$\therefore \text{milk} = \frac{3}{7}x$$

Vessel B : \therefore ratio of milk & water is 2 : 3,

$$\therefore \text{milk} = \frac{2}{5}y$$

Ratio of milk & water in final mixture = 20 : 29

$$\therefore \frac{3}{7}x + \frac{2}{5}y = \frac{20}{49}(x + y)$$

$$\Rightarrow \frac{x}{y} = \frac{2}{5} = 2 : 5$$

27. First 6 even whole numbers from AP : 0, 2, 4, \dots

$$\text{sum of AP} = \frac{n}{2}(2a + (n - 1)d)$$

$$\frac{6}{2}(2 \times 0 + (6 - 1)2) = 30$$

$$\therefore \text{Average} = \frac{30}{6} = 5$$

28. Total weight of class = average weight \times number of students

$$= 46 \times 100 = 4600$$

similarly, total weight of girls = 40×40

$$= 1600$$

$$\therefore \text{Total weight of boys} = 4600 - 1600 = 3000$$

$$\text{Average weight of boys} = \frac{3000}{\text{number of boys}}$$

$$= \frac{3000}{100 - 40} = 50$$

29. $a : b = 5 : 12; b : c = 24 : 15$

$$\therefore a : b : c = 10 : 24 : 15$$

$$\therefore a : c = 2 : 3$$

30. $27 : 12 :: 24 : x$

$$\Rightarrow \frac{7}{12} = \frac{24}{x}$$

$$\Rightarrow x = \frac{288}{27} = 10.67$$

correct ans is not available in the options.

31. Let quantity from vessel A & B in new mixture = x : y

\therefore Ratio in vessel A = 7 : 2,

$$\therefore \text{spirit} = \frac{7}{9}x$$

\therefore Ratio in vessel B = 5 : 3,

$$\therefore \text{spirit} = \frac{5}{8}y$$

Final ratio = 5 : 2,

$$\therefore \text{spirit} = \frac{5}{7}y$$

$$\therefore \frac{7}{9}x + \frac{5}{8}y = \frac{5}{7}(x + y)$$

$$\Rightarrow x : y = 45 : 32$$

32. Squares of first 5 whole numbers = 0, 1, 4, 9, 16

$$\therefore \text{Average} = \frac{0+1+4+9+16}{5} = 6$$

33. Let 11th observation = x

$$\therefore 21 \times 40 + x = 11 \times 38 + 11 \times 41$$

$$\Rightarrow x = 29$$

34. $\frac{a}{b} = \frac{2}{3}$ a + b = 45

$$a : b = 2x : 3x \Rightarrow 5x = 45$$

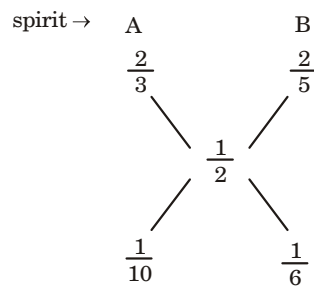
$$\Rightarrow a = 2x = 18$$

35. 2, x, x², 4 are in proportion

$$\Rightarrow 2x^2 = x \times 4$$

$$\Rightarrow x = 2$$

36.



$$\therefore \text{ratio} = \frac{1}{10} = \frac{1}{6}$$

$$= 6 : 10 = 3 : 5$$

37. Average = $\frac{4+6+0+3+6}{6} = 3.8$

38. Average = $\frac{20 \times 18 + 30 \times 25}{50} = 22.2$

39. a : b = 4 : 5

$$4x : 5x$$

$$\Rightarrow a + b = 63$$

$$\Rightarrow 9x = 63$$

$$\Rightarrow x = 7$$

$$\therefore a = 4 \times 7 = 28.$$

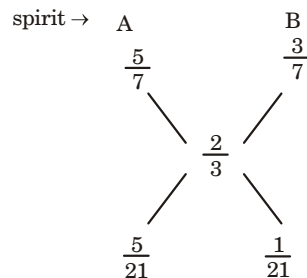
40. 3, x, 2x, 50 are in proportion

$$\Rightarrow \text{Product of extremes} = \text{Product of means.}$$

$$\Rightarrow 3 \times 50 = 2x \times x$$

$$\Rightarrow x = \sqrt{75} = 5\sqrt{3}$$

41.



42. Average of cubes of 1st five whole numbers

$$= \frac{0^3 + 1^3 + 2^3 + 3^3 + 4^3}{5}$$

$$= \frac{1+8+27+64}{5} = 20$$

43. The sixth observation

$$= 6 \times 18 + 6 \times 25 - 11 \times 20 = 38$$

44. a : b = 5 : 6

$$5x : 6x$$

$$a + b = 220$$

$$\Rightarrow 11x = 220$$

$$\Rightarrow x = 20 \Rightarrow a = 5 \times 20$$

$$= 100$$

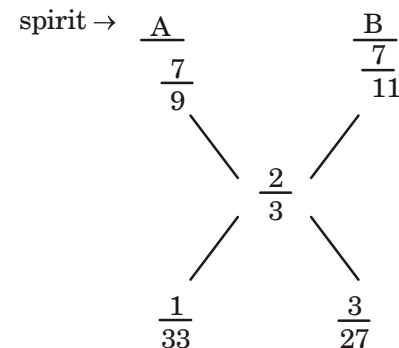
45. 4, x, 2x, 32 are in proportion

$$\Rightarrow \text{Product of extremes} = \text{product of means}$$

$$\Rightarrow 4 \times 32 = 2x \times x$$

$$\Rightarrow x = 8$$

46.



$$\therefore \text{ratio} = \frac{1}{33} : \frac{1}{9}$$

$$= 3 : 11$$

47. Average of first 5 add prime Numbers

$$= \frac{3+5+7+11+13}{5} = 7.8$$

48. Combined Average = $\frac{18 \times 30 + 22 \times 40}{18 + 22}$

$$= 35.5$$

49. a : b = 3 : 7

$$\Rightarrow b = \frac{7}{3}a$$

$$a + b = 80 \Rightarrow a + \frac{7}{3}a = 80$$

$$\Rightarrow a = 24$$

50. Product of means = product of extremes

$$\Rightarrow 3x \times 6 = 8 \times 27$$

$$\Rightarrow x = 12$$

51. Let quantity of liquid of A in mixture = x
 Let _____ B _____ = y
 \therefore Milk from A + Milk from B = total milk

$$\Rightarrow \frac{5}{9}x + \frac{3}{8}y = \frac{1}{2}(x + y)$$

$$\Rightarrow \frac{x}{y} = \frac{9}{4} = 9 : 4$$

52. Average = $\frac{\text{sum of first 7 whole numbers}}{7}$

$$= \frac{0 + 1 + 2 + 3 + 4 + 5 + 6}{7}$$

$$= 3$$

53. Average = $\frac{16 \times 25 + 24 \times 30}{40}$

$$= 28$$

54. (if total marks = x)

$$\frac{30}{100}x + 42 = \frac{50}{100}x - 42$$

$$\Rightarrow x = 420$$

$$\therefore \text{pass marks} = \frac{30}{100}x + 42$$

$$= \frac{30}{100} \times 420 + 42 = 40$$

55. A : B = 2 : 3 ; $\frac{B}{C} = \frac{4}{5}$; $\frac{C}{D} = \frac{5}{2}$

$$= 8 : 12 = \frac{8}{10} = \frac{10}{4}$$

$$= \frac{12}{15} = \frac{15}{6}$$

$$\therefore A : B : C : D = 8 : 12 : 15 : 16$$

56. Let incomes = 4x & 3x

expenditures = 3y & 2y

$$A/Q, 4x - 3y = 5000 \quad (1)$$

$$3x - 2y = 5000 \quad (2)$$

Solving (1) & (2) : -

$$x = 5000$$

$$\therefore \text{Incomes} = 7x$$

$$= 7 \times 5000$$

$$= \text{Rs. } 35000$$

57. Let quantity of vessels = x

$$\therefore A/Q \text{ final ratio} = \frac{5x}{12} + \frac{7x}{20}$$

$$= \frac{7x}{12} + \frac{13x}{20}$$

$$= 23 : 37$$

58. Initial weight of copper = $\frac{60}{100} \times 150$

Let weight of copper added = x

$$\therefore \frac{60}{100} \times 150 + x = \frac{70}{100}(150 + x)$$

$$\Rightarrow x = 50$$

59. Let numbers be a, a + 1, a + 2, a + 3, a + 4

$$\therefore 5a + 10 = 40$$

$$\therefore \text{Average} = \frac{6 + 10}{2} = 8$$

60. 5 years ago \rightarrow age of (A + B + C) = $20 \times 3 = 60$

\downarrow

4 years ago \rightarrow age of (A + B + C) = $60 + 3 = 63$

A/Q, Age of (A + B) = 19×2

four years ago = 38

$$\therefore C's \text{ age four years ago} = 63 - 38$$

$$= 25$$

$$\therefore C's \text{ present age} = 25 + 4$$

$$= 29 \text{ years}$$

61. A = 0.9C, B = 12C

$$\frac{B}{A} = \frac{1.2C}{0.9C} \times 100 = \frac{4}{3} \times 100 = 133\frac{1}{3}\%$$

62. A = $\frac{2B}{3}$, B = $\frac{9C}{7}$ or A = $\frac{2}{3} \times \frac{9C}{7} = \frac{18C}{21}$

$$C = \frac{14D}{15} \text{ or } A = \frac{18}{21} \times \frac{14D}{15} \text{ or } \frac{A}{D} = \frac{4}{5}$$

63. $\frac{x}{y} = \frac{15}{13}$, $\frac{x+3}{y+3} = \frac{8}{7}$

$$7z + 21 = 8y + 24 \text{ and } 13x - 15y = 0$$

$$\text{or } 7x - 8y = 3$$

On solving we get

$$x = 45, y = 39$$

$$\text{Sum} = 84.$$

64.

$$\begin{array}{ccc} \text{Alloy 1} & & \text{Alloy 2} \\ \frac{2}{11} & & \frac{5}{21} \\ & \searrow & \nearrow \\ & \frac{1}{5} & \\ & \nearrow & \searrow \\ \frac{5}{21} - \frac{1}{5} & : & \frac{1}{5} - \frac{2}{11} \\ & & \frac{4}{110} : \frac{1}{55} \end{array}$$

$$= 2 : 1.$$

65.
$$\begin{array}{ccc} 40 & & 19 \\ & \searrow & / \\ & 26 & \\ & / & \searrow \\ 26 - 19 & : & 40 - 26 \\ 7 : 14 \\ 1 : 2 \end{array}$$

 or 40% mixture : 19% mixture is 1 : 2

$\therefore \frac{2}{3}$ of the jar was replaced.

66.
$$\frac{A+B}{2} - 5 = 18 \text{ or } A + B = 46$$

$$\frac{A+B+C+D}{4} = 24 \text{ or } C + D = 50$$

$$\frac{C+D+16}{2} = 33.$$

67. 5 consecutive odd numbers = $x - 2, x, x + 2, x + 4, x + 6$.
 Average = $\frac{5x+10}{5} = 27$ or $x = 25$

Average of first 3 = 25.

68. $x \times \frac{4}{5} \times \frac{5}{4} = x$

69. $A = \frac{3B}{2}, B = \frac{5C}{4}$ or $A = \frac{15C}{8}, C = \frac{7D}{6}$
 or $\frac{A}{D} = \frac{15}{8} \times \frac{7}{62} = \frac{35}{16}$.

70. $\frac{4}{3} = \frac{x}{y}, \frac{x+6}{y+6} = \frac{5}{4}$ or $4x + 24 = 5y + 30$
 $5y - 4x = 6 \times 3 \Rightarrow 15y - 12x = 18$
 $4y - 3x = 0 \times 4 \Rightarrow 16y - 12x = 0$
 $y = 18, x = 24$
 or $x + y - (x - y) = 36$.

71. Vessel 1 = 30 Vessel 2 = 50
 acid = 25 acid = 40
 water = 5 water = 10
 Total = 65 : 15 = 13 : 3.

72. $\frac{45+x}{180+x} = 0.4$ or $45 + x = 72 + 0.4x$
 $0.6x = 27$ or $x = \frac{270}{6} = 45$

73. Average charge = $\frac{3 \times 150 + 4 \times 75 + 13 \times 50}{3 + 4 + 13}$
 $= \frac{450 + 300 + 650}{20} = 70.$

74. $\frac{20 \times 11 + x \times 12}{20 + x} = 11.6$

$220 + 12x = 232 + 11.6x$

$0.4x = 12$ or $x = 30$

girls : boys = 30 : 20 or 3 : 2

75. The average also gets multiplied
 \therefore Average = $7 \times 8 = 56$.

76. Take 1, 2, 3, 4 and 5 as example.
 Average increases from 2 to 3.
 \therefore Increases by 1.

77. $A + B + C + D = 500, A + B = 3(C + D), B = 4C$
 and $C = 1.5D$
 or $4C + 4D = 500$

$10D = 500$ or $D = 50, B = 4 \times 1.5D = 6D = 300.$

78. $25x + 50(150 - x) = 5800$
 $25x = 5800 - 150 \times 50$

$x = \frac{1700}{25} = 68.$

79. $1.4 \times x = 1$ or $x = \frac{10}{14} = \frac{5}{7} = 71.4285$

or reduction = $100 - 71.428 = 28.572$.

80. Ratio of spirit in the vessels = $\frac{5}{7}, \frac{7}{13}$ and $\frac{8}{13}$

$$\begin{array}{ccc} \frac{5}{7} & & \frac{7}{13} \\ & \searrow & / \\ & \frac{8}{13} & \\ & / & \searrow \\ \frac{1}{13} & : & \frac{9}{91} \end{array}$$

$\Rightarrow 7 : 9.$

81. Let the initial average = x

$\therefore \frac{85-x}{17} = x \Rightarrow x = 34$

Final average = $34 + 3 = 37$

82. $a : b = 2 : 3 = 10 : 15$ and $b : c = 5 : 8 = 15 : 24$

$\therefore a : b : c = 10 : 15 : 24$

$10x + 15x + 24x = 98$

\therefore Second number = 15×2

$\Rightarrow x = 2 = 30$

83. Let share of C = c

$$\therefore \text{B gets } \frac{1}{4}c$$

$$\text{A gets } \frac{2}{3} \times \frac{1}{4}c = \frac{1}{6}c$$

$$\left(\frac{1}{6} + \frac{1}{4} + 1\right)c = 680$$

$$\Rightarrow c = 480$$

84. Let students in initial batches = 3x, 3x, 5x

Let students in final batches = 4y, 5y, 7y

$$\therefore \begin{cases} 2x + 20 = 4y \\ 3x + 20 = 4y \end{cases} \rightarrow \begin{cases} y = 10 \\ x = 10 \end{cases}$$

$$\therefore \text{Initial total number of students} = 10x \\ = 100$$

85. Let the number = x

$$\text{Percentage change} = \frac{(x+5) - (x-5)}{x} \times 100$$

$$= \frac{10}{x} \times 100$$

\therefore is not known, \therefore answer cannot be determined.

86. As per given costs:

3 ball - 2 pad

$$\Rightarrow \frac{\text{ball}}{\text{pad}} = \frac{1}{3} = \frac{8}{12}$$

3 pad = 2 gloves

$$\Rightarrow \frac{\text{pad}}{\text{gloves}} = \frac{2}{3} = \frac{12}{18}$$

3 gloves = 2 bats

$$\Rightarrow \frac{\text{gloves}}{\text{bats}} = \frac{2}{3} = \frac{18}{27}$$

$$\therefore \text{ball} : \text{pad} : \text{gloves} : \text{bats} = 8 : 12 : 18 : 27$$

Given cost of bat = 54

$$\Rightarrow 27x = 54$$

$$\Rightarrow x = 2$$

$$\therefore \text{Cost of ball} = 8x = 16$$

87. Let the third variety of tea quantity = x

As per the ratio 1 : 1 : 2, assume that 1 kg, 1 kg & 2 kg of the 3 varieties of tea is mixed

$$\therefore \frac{(126 \times 1 + 135 \times 1 + 2x)}{1 + 1 + 2} = 153$$

$$\Rightarrow x = 175.50$$