Arithmetic
Ratio and Proportion

Select the correct answer from gives four possible answers for each of the following:

1. If A : B = 2 :3, B : C = 4:5, then A :C =
    (a) 6 : 7   (b) 7: 6   (c) 8 :15   (d) 15: 8

2. The inverse ratio of $1\dfrac{3}{5} : 2\dfrac{1}{4}$ is

    (a) 32 : 45 (b) 45: 32   (c) 18 :5   (d) 5: 18

3. The ratio of 10 metres to ₹ 15
    (a) The ratio can not be determined   (b) 2 :3   (c) 3 :2   (d)5 :10

4. If twice of money of A = 5 times of money of B, then the ratio of money of A to that of B =
    (a) 2 : 5   (b) 15: 25   (c) 12 :30   (d) 5: 2

5. The ratio $\dfrac{5}{3} : 2\dfrac{1}{4}$ is

    (a) Ratio of lesser in equality
    (b) Ratio of greater inequality
    (c) 20 : 9
    (d) 5 :27

6. The ratio of present age of Jadu to that of Madhu is 4 : 5. If the present age of Madhu is 30 years, then the present age of Jadu is :
    (a) 20 years   (b) 25 years   (c) 24 years   (d) 35 years

7. The ratio of 5 kg 55 gm to 35 kg 50gm =
    (a) 5 : 7   (b) 1011: 7010   (c) 111 :710   (d) None of these

8. The ratio 1 year 6 month : 2 years : 2 years 6 months =
    (a) 3 : 4 : 5 (b) 2: 3 :5   (c) 2 :4 : 5   (d) None of these

9. If $\dfrac{1}{2}$ of money of A = $\dfrac{1}{3}$rd money of B = $\dfrac{1}{4}$ of money of C, then the continued ratio of money of A, B and C =
    (a) 2 : 3 : 4 (b) 6: 4 :3   (c) 4 :3 : 2   (d) 3 : 2 : 1

10. Some money is distributed between A and B in the ratio 2 : 3 . If A receives Rs 72 , then B receives =
    (a) ₹90   (b) ₹144   (c) ₹108   (d) None of these

11. ₹ 2530 is distributed between Ram and Hari such that Ram gets $\dfrac{11}{12}$ part that Hari gets. Then Hari gets :
    (a) ₹1320   (b) ₹1210   (c) ₹1230   (d) ₹1310

12. Some amount of money is distributed among Rama, Mita and shipra such that twice the money that Rama gets = thrice the amount of money that Mita gets = four times the amount of money that Shipra gets. Then the continued ratio of their money is
    (a) 2 : 3 : 4 (b) 4: 3 :2   (c) 6 :4 : 3   (d) 3 : 2 : 1

13. In a map 2 cm denotes a distance of 3 km., then the seale in the map is :
    (a) 1 : 150000   (b) 1 : 15000   (c) 1 : 1500   (d) 2 : 3

14. The ratio of two numbers is 2 : 3. If 6 is subtracted from the second number then the number which is subtracted from the first number so that the new ratio becomes the same as that of the previous, is
    (a) 2   (b) 6   (c) 8   (d) 4

15. The sub- duplicate ratio of 49 : 81 is :
    (a) 81 : 49 (b) 7 : 9   (c) 9 : 7   (d) $\sqrt{7}$: 3

16. $(\dfrac{1}{2} + \dfrac{1}{3}) : (\dfrac{1}{2} \times \dfrac{1}{3})$ =
    (a) 2 : 3   (b) 3 : 2   (c) 5 : 1   (d) 1 : 5

17. The compound ratio of 1.2 : 2.5, 2.1 : 3.2 and 5 : 3 is
    (a) 21 : 25 (b) 27 : 40   (c) 21 : 40   (d) None of these

18. If A : B = 3 : 4, B : C = 2 : 5, then A : B : C =
    (a) 3 : 4 : 5 (b) 3: 4 :10   (c) 4 :3 : 10   (d) 3 : 4 : 8

19. Two numbers are in the ratio is 5 : 8 and if 6 be subtracted from each of them then the remainders are in the ratio 1 : 2, then the numbers are :
    (a) 15, 12   (b) 12, 18   (c) 15, 24   (d) none of these

20. If the price of a pair of pens is `95, the price of  3 books of Mathematics is `60, then the continued ratio of the price per piece of each item is :
    (a)19 : 25 : 2   (b) 21: 25 : 2   (c) 19 : 30 : 3   (d) None of these

21. If 3x + 4y : 5x – 3y = 5 : 3, then x : y =
    (a) 16 : 27 (b) 27 : 16   (c) 8 : 9   (d) None of these

22. The ratio of two numbers is 12 : 5. If the antecedent is 45, then the consequent is :
    (a) 108   (b) 15   (c) 18.75   (d) 20

23. If the ratio of two positive numbers is 4 : 5 and their L. C. M. is 140, then the numbers are :
    (a) 28, 35   (b) 28, 40   (c) 35, 45   (d) none of these

24. If the ratio of positive numbers is 5 : 9 and their H. C. F. is 4, then the L. C. M. of the number is
    (a) 90   (b) 180   (c) 45   (d) None of these

25. If the ratio of two positive numbers is 7 : 8 and their L. C. M. is 224, then their H. C. F. is :
    (a) 6   (b) 8   (c) 4   (d) None of these

26. The compound ratio of sub-duplicate ratio and sub-triplicate ratio of 729 : 64 is
    (a) 81 : 8   (b) 81 : 16   (c) 729 : 16   (d) 243 : 32

27. The ratio of two numbers is 11:15. The sum of 3 times the first number and twice the second number is 630. The H. C. F. of the number is :
    (a) 10   (b) 12   (c) 15   (d) None of these

28. The mean proportional of 4X and 16X³ is :
     (a) $10\,x^2$ (b) $12\,x^2$ (c) $8\,x^2$ (d) $64\,x^4$

29. The third proportional of 1 hour 20 minutes, 1 hour 40 minutes is :
     (a) 1 hour 50 minutes   (b) 2 hours   (c) 2 hours 5 minutes   (d) 2 hours 25 minutes

30. The fourth proportional of ₹5, ₹3.50, 150 gm is
     (a) 100 gm (b) 105 gm   (c) 125 gm   (d) none of these

31. If A: B = B : C = C : D = 5 : 6, then A : B : C : D =
     (a) 125 : 150: 180 : 216   (b) 25 : 30 : 36 : 48   (c) 75 : 84 : 96 : 108   (d) None of these

32. If the first and third numbers of four positive numbers in continued proportion be 3 and 12 respectively then fourth number is
     (a) 27   (b) 36   (c) 48   (d) None of these

33. A purse contains 1 rupee coin, 50 paisa coin, 25 paisa coin. The ratio of their numbers are $x:y:z$. The ratio of their values =
     (a) $4x:2y:z$ (b) $2x:3y:z$ (c) $4x:3y:z$ (d) $x:2y:4z$

34. Of the four numbers in proportion, if the product of two middle numbers is 48, the other numbers are :
     (a) 32,16   (b) 18, 30   (c) 3, 16   (d) 6, 24

35. If 0.5 of A = 0.6 of B = 0.75 of C and A+B+C = 60, then the number which is to be added to A so that the result of this addition and B, C will be in continued proportion, is :
     (a) 1   (b) 2   (c) 3   (d) 4

36. The mean proportion of three numbers in continued proportion is 16, then the other numbers are :
     (a) 12, 8   (b) 64, 2   (c) 80, 5   (d) $\sqrt{.01}$, 2560

37. If A : B = 5 : 8, A : C = 6 : 11, then A : B: C =
     (a) 30 : 36 : 55   (b) 24 : 30 : 55   (c) 30 : 48 : 55   (d) None of these

38. If X : Y = 2 : 3, X : Z = 5 : 7, then (3X + 2Y) : (5Y − 2 Z) =
     (a) 60 : 49   (b) 60 : 47   (c) 47 : 60   (d) None of these

39. The distance between two places in a map of 1: 2500000 scale is 8 cm. Then the actual distance between the two places is :
     (a) 200 km   (b) 300 km   (c) 100 km   (d) None of these

40. 5 years ago, the ages of father and son were in the ratio 5 : 3. If the sum of their present ages is 90 years. The present age of father is :
     (a) 50 years   (b) 60 years   (c) 55 years   (d) None of these

A.P. and G.P, HP.

41. The sum of first 9 terms of the series $\dfrac{1}{2}$, $\dfrac{1}{3}$, $\dfrac{1}{6}$, 0, ... is :

    (a) $\dfrac{3}{2}$ (b) $-\dfrac{3}{2}$ (c) 3   (d) $- 3$

42. If the sum of first 8 terms and the sum of first 19 terms of an A.P. are 64 and 361 respectively, then the sum of its first n terms is :
    (a) $n^2 + 1$ (b) $2n – 1$ (c) $n^2 – 1$ (d) n^2

43. If the sum of first n terms of an A. P. is $3n^2$, then its common difference is :
    (a) 6   (b) 9   (c) 15   (d) None of these

44. The sum of all odd positive integers containing two digits is :
    (a) 2475   (b) 2530   (c) 4905   (d) 5049

45. If the ratio of the sums first n terms of two A.P.s is $(3n + 5) : (5n – 9)$, then the ratio of their n th terms is :

    (a) $\dfrac{6n+1}{10n-13}$ (b) $\dfrac{3n+1}{5n+7}$ (c) $\dfrac{3n+1}{5n-7}$ (d) None of these.

46. In an increasing G. P., if the sum of first and last terms is 66, the product second term and the second term from the end is 128; the sum of all the terms of the progression is 126, then total number of terms of the progression is :
    (a) 5   (b) 6   (c) 8   (d) None of these

47. If in a G.P., The ratio of the sum of first three terms to the sum of first six terms is 125 : 152, then the common ratio of the G.P. is :

    (a) 2   (b) $\dfrac{3}{2}$ (c) $\dfrac{5}{3}$ (d) $\dfrac{3}{5}$

48. If each terms (except the first and second terms) of a G. P. consisting of positive terms is the sum of its just two preceding terms, then the common ratio of the G. P. is :

    (a) $\dfrac{\sqrt{5}-1}{2}$ (b) $\dfrac{\sqrt{5}+1}{2}$ (c) 2   (d) None of these

49. x, y, z are three positive numbers where 2 log y, log x, 4 log z are in G.P. and xyz = 81...., $2x$, $\dfrac{1}{2}$ y^2, z^2 are in A.P. then the relation among x,y,z is :

    (a) x =y=z   (b) x : y : z = 9 : 3 : 1   (c) x , y, z are in G.P.   (d) none of these

50. If the m th term and n th term of an A.P. are $\frac{1}{n}$ and $\frac{1}{m}$ respectively, them the m nth term is:

   (a) $\frac{1}{mn}$ (b) 1 (c) $\frac{1}{mn} + \frac{1}{n}$ (d) O.

51. $\frac{1}{1+\sqrt{x}}, \frac{1}{1+x}, \frac{1}{1-\sqrt{x}}$ (xyo) are in:

   (a) A.P. (b) G.P. (c) H.P. (d) None of these

52. The sum of all the nature numbers divisible by 3 and bying between 250 and 1000 is
   (a) 156175 (b) 146375 (c) 156375 (d) None of these

53. The sum of all integers from 1 to 100 which are divisible by 2 or 5 is :
   (a) 3000 (b) 3250 (c) 3200 (d) 3050

54. If the m th term is n and n th term is m of an A.P., then the P- th term of it is :
   (a) m+n+p (b) m+n-p (c) m-n+p (d) None of these

55. If a,b,c,x,y,z are in A.P., then the value of (y-c) is :
   (a) 2 (c-a) (b) 2 (z-x) (c) 2 (x-c) (d) (x-c)

56. If the sum of first 2n terms of the series 2, 5, 8, ... is equal to the sum of first n terms of the series 57, 59, 61, ..., then n =
   (a) 10 (b) 12 (c) 11 (d) 13

57. If the arithmetic mean between a and b is $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$ then the value of n is:

   (a) 0 (b) 1 (c)-1 (d) None of these

58. In an A.P., the sum of two equidistant terms from the beginnings and end is equal to :
   (a) Turice the first term (b) Turice the last term
   (c) sum of first and last terms (d) None of these

59. If a, b, c are in A. P., then 2^{ax+1}, 2^{bx+1}, 2^{cx+1}, x ≠ 0 are in
   (a) A.P. (b) G.P. (c) H.P. (d) None of these

60. log $^3_7$, log ^{3} $_{14}$, log ^{3} $_{28}$ are in :
   (a) A.p. (b) G.P. (c) H.P. (d) None of these

61. If the p- th term of an A.P. is 1-6 (3p – 1), then the sum of its first n terms is
   (a) $\frac{n}{12}$ (3n +1) (b) $\frac{n}{12}$ (3n-1) (c) $\frac{n}{2}$ (6n +1) (d) None of these

62. In an A.P., if the sum of first m terms is n and sum of first n terms is m, then sum of its first (m+n) terms is :
   (a) O (b) m+n (c) m-n (d) None of these

63. If A is the A. M. and r, q be two G.M.s between two numbers then :
   (a) p³ + q³ = Apq (b) p² +q² = 2Apq (c) p³ + q³ = 2Apq (d) None of these

64. If the third term of a G.P. is 5, then the product of its first 5 terms is:

(a) 5^5 (b) 5^4 (c) 5^3 (d) None of these

65. If the sum of first n natural is numbers is equal to $\frac{1}{5}$ th of the sum of their squares then n =

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

Indices & Surds

66. If $a^x = b^y = c^z$ and $b^2 = ac$, then zy + yz =
(a) xz (b) $- xz$ (c) $2xz$ (d) None of these

67. If $\dfrac{\left(p+\frac{1}{q}\right)^p \cdot \left(p-\frac{1}{q}\right)^p}{\left(q+\frac{1}{p}\right)^p \left(q-\frac{1}{p}\right)^q} = \left(\dfrac{p}{q}\right)^x$, then the value of x

(a) p - q   (b) p + q   (c) q - p   (d) None of these

68. The digit in the unit place of $(2 \times 4^x)^2 + 1$ (where x is a positive integer) is :
(a) 1   (b) 5   (c) 3   (d) None of these

69. If $\dfrac{\left(x+1\right)^y \cdot \left(2x \cdot 2\right)^x}{\left(y+1\right)^x \cdot 2^{2y}} = 1$, then the value of y is :

(a) 0   (b) 1   (c) x (d) $2x$

70. If $a^{x-1} = bc$, $b^{y-1} = ca$, $c^{z-1} = ab$, then $\dfrac{1}{x} + \dfrac{1}{y} + \dfrac{1}{z} =$

(a) 1   (b) 0   (c) abc   (d) None of these

71. If $3^x = 5y = (225)^z$, then Z =

(a) $\dfrac{xy}{x+y}$ (b) $\dfrac{xy}{2(x+y)}$ (c) $2(x+y)$ (d) None of these

72. If $x \neq 1$ and $x^{x^4 \sqrt{x}} = \left(x^{-4\sqrt{x}}\right)^x$, then $x =$

(a) -1   (b) 0   (c) $\dfrac{625}{256}$ (d) None of these

73. If $a^{\frac{1}{3}} + b^{\frac{1}{3}} + c^{\frac{1}{3}} = 0$, then $(a+b+c)^3$
(a) 3abc   (b) 27abc   (c) – 27abc   (d) None of these

74. If $y = x^{\frac{1}{3}} - x^{-\frac{1}{3}}$, then $Y^3 + 3y =$

(a) $x - \dfrac{1}{x}$ (b) $x + \dfrac{1}{x}$ (c) $\dfrac{1}{x} - x$ (d) None of these

75. If $a = 2 + \sqrt[3]{2} + \sqrt[3]{4}$, then $a^3 - 6a^2 + 6a =$
(a) 1   (b) 0   (c) 2   (d) None of these

76. If $3^x = 9y$, then $\dfrac{1}{x} - 1 =$

(a) 1   (b) 2   (c) $\frac{1}{2}$ (d) 0

77. If $64^x = 2\sqrt{2}$, then $x =$

   (a) $\dfrac{1}{6}$ (b) $\dfrac{1}{2}$ (c) $\dfrac{1}{4}$ (d) none of these

78. If $x = 8$, Y $= 27$, then the value of $\left(x^{\frac{4}{3}} + y^{\frac{2}{3}} \right)^{\frac{1}{2}}$ is

   (a) 2   (b) 5   (c) 1   (d) 4

79. If $9 \times 81^x = \dfrac{1}{27^{x-3}}$, then the value of x is

   (a) 2   (b) 1   (c) 0   (d) None of these

80. If $5^{4x} = 100000$, then $5^{-x} =$

   (a) $\dfrac{1}{10}$ (b) $\dfrac{1}{5}$ (c) $\dfrac{1}{2}$ (d) 2

81. If $x = \sqrt[3]{\sqrt{2}+1} - \sqrt[3]{\sqrt{2}-1}$, then the value of $x^3 = 3x$ is :

   (a) 0   (b) 1   (c) 2   (d) None of these

82. If $x = 5 + 2\sqrt{6}$ and $xy = 1$, then $\dfrac{1}{x^2} + \dfrac{1}{y^2} =$

   (a) 22   (b) 98   (c) 49   (d) None of these

83. $\dfrac{\sqrt{5} - \sqrt{3 - \sqrt{5}}}{\sqrt{2} + \sqrt{7 - 3\sqrt{5}}} =$

   (a) 1   (b) 5   (c) 10   (d) None of these

84. If $x = 3 + 2\sqrt{2}$, then the value of $\left(x^3 + \dfrac{1}{x^3} \right) - 5\left(x^2 + \dfrac{1}{x^2} \right) - 5\left(x + \dfrac{1}{x} \right)$ is :

   (a) 0   (b) 1   (c) -2 (d) None of these

85. $\dfrac{\sqrt{3}}{\sqrt{7} + \sqrt{11}} - \dfrac{2\sqrt{7}}{\sqrt{11} + \sqrt{3}} - \dfrac{\sqrt{11}}{\sqrt{3} + \sqrt{7}} =$

   (a) 0   (b) $2\sqrt{7} + \sqrt{3} - \sqrt{11}$ (c) 21   (d) None of these

86. If $2^{x+2y} = 2^{2x-y} = \sqrt{8}$, then

   (a) $x = \dfrac{3}{10}$, Y $= \dfrac{9}{10}$ (b) $x = \dfrac{9}{10}$, Y $= \dfrac{3}{10}$ (c) $x = \dfrac{3}{5}$, Y $= \dfrac{6}{5}$ (d) None of these

87. The mean proportional between $\sqrt{11} - \sqrt{5}$ and $13\sqrt{11} + 19\sqrt{5}$ is :

   (a) $\sqrt{33} - \sqrt{15}$ (b) $\sqrt{33} + \sqrt{15}$ (c) $\sqrt{11} + \sqrt{5}$ (d) None of these

88. $\dfrac{3 + \sqrt{6}}{5\sqrt{3} - 2\sqrt{12} - \sqrt{32} + \sqrt{50}} =$

(a) $\sqrt{2}$ (b) 1 (c) $\sqrt{3}$ (d) None of these

89. If $x = 2 + \sqrt{5}$, then $x^3 + 3x^2 - 29x =$
    (a) 7 (b) 10 (c) 0 (d) None of these

90. $\dfrac{\sqrt{10} + \sqrt{18}}{\sqrt{18} - \sqrt{3} - \sqrt{5}} =$

    (a) 13 +5 $\sqrt{5}$ (b) $\dfrac{13 - 5\sqrt{5}}{11}$ (c) $\dfrac{13 + 5\sqrt{5}}{11}$ (d) None of these

91. If $a = \dfrac{1}{2 + \sqrt{3}}$ and b = $\dfrac{1}{2 - \sqrt{3}}$, then the value of 2a² + 3ab – 2b² =
    (a) $3 - 16\sqrt{3}$ (b) $3 + 16\sqrt{3}$ (c) $2 + 8\sqrt{3}$ (d) $2 - 8\sqrt{3}$

92. $\sqrt{49 + 20\sqrt{6}} =$
    (a) $5 - 2\sqrt{6}$ (b) $5 + 2\sqrt{6}$ (c) $7 + 4\sqrt{3}$ (d) $7 + 5\sqrt{6}$

93. If $x = 7 + 4\sqrt{3}$, then $\sqrt{x} + \dfrac{1}{\sqrt{x}} =$
    (a) 3 (b) 6 (c) 4 (d)   2

94. The value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + ...}}}$ to infinity is
    (a) 6 (b) 4 (c)   -2 (d) 3

95. If $\dfrac{(x - \sqrt{24})(\sqrt{75} + \sqrt{50})}{\sqrt{75} - \sqrt{50}} = 1$, then the value of x is
    (a) 6 (b) 5 (c) 8 (d) None of these

Variation

96. If $x \propto a^2$, then $a \propto$ ....
    (a) x^4 (b) $\sqrt{x}$ (c) $\dfrac{1}{\sqrt{x}}$ (d) None of these

97. If $x^2 + y^2 \propto x^2 - y^2$, then $x \propto$ ......
    (a) y (b) $\sqrt{y}$ (c) $\dfrac{1}{\sqrt{y}}$ (d) None of these

98. If $x \propto \dfrac{1}{\sqrt{a}}$, then $a \propto$ ....
    (a) x^2 (b) $\sqrt{x}$ (c) $\dfrac{1}{x}$ (d) $\dfrac{1}{x^2}$

99. If $A \propto B^2$ and A = 4 then B = 4. When A= 3, the value of B^2 is :

   (a) 12   (b) 16   (c) 9   (d) None of these

100. If x varies inversely with Y and if Y = 3, then x = 8. The value of Y when x = 2 is :

   (a) 24   (b) 18   (c) 12   (d) None of these

101. If $x^2 \propto yz, y^2 \propto zx, z^2 \propto xy$, then the product of three constant of variation is :

   (a) 0   (b) 1   (c) 3   (d) xyz

102. If x is proportional directly to Y and inversely with z; y = 5, z = 9 then $x = \dfrac{1}{6}$. The relation among x , y, z is :

   (a) $x = \dfrac{3y}{10z}$ (b) $x = \dfrac{10z}{3y}$ (c) $x = \dfrac{5y}{3z}$ (d) None of these

103. If y varies inversely with the square x and x = 2 when y = 9, then the value of y when x = 3 is :

   (a) 6   (b) 12   (c) 4   (d) 9

104. If $x \propto yz^2, y \propto ab^2 and\ z \propto \dfrac{b}{a}$, then the relation of x with a and is

   (a) $x \propto \dfrac{a^4}{b}$ (b) $x \propto \dfrac{a}{b^4}$ (c) $x \propto \dfrac{b^2}{a}$ (d) $x \propto \dfrac{b^4}{a}$

105. If $b \propto a^3$ and a increases in the ratio 3 : 2, then b increases in the ratio :

   (a) 8 : 27   (b) 27 : 8   (c) 2 : 3   (d) None of these

Answer

1.(c) 2. (b) 3. (a) 4. (d) 5. (a) 6.(c) 7. (b) 8.(a) 9. (a) 10. (c) 11. (a) 12. (c)
13. (a) 14. (d) 15. (b) 16. (c) 17. (c) 18. (b) 19. (c) 20. (a) 21. (b) 22. (c) 23. (a) 24. (b) 25. (c) 26. (d) 27. (a) 28. (c) 29. (c) 30. (b) 31. (a) 32. (d) 33. (a) 34. (c) 35. (a) 36. (d) 37. (c) 38. (b) 39. (a) 40. (c) 41. (b) 42. (d) 43. (a) 44. (a) 45. (c) 46. (b) 47.(d) 48. (b), 49. (c) 50. (b) 51. (a) 52. (c) 53. (d) 54. (b) 55. (c) 56. (c) 57.(a) 58. (c) 59. (b) 60. (c) 61. (a) 62. (d) 63. (c) 64. (a) 65. (c) 66. (c) 67. (b) 68. (b) 69. (d) 70. (a) 71. (b) 72.(c) 73.(b) 74. (a) 75. (c) 76. (a) 77. (c) 78. (b) 79. (b) 80. (a) 81. (c) 82. (b) 83. (a) 84. (c) 85. (a) 86. (b) 87. (b) 88. (c) 89. (a) 90. (c) 91. (a) 92. (b) 93. (c) 94. (d) 95. (b) 96. (b) 97. (a) 98. (d) 99. (a) 100. (c) 101. (b) 102. (a) 103. (c) 104. (d) 105. (b.)