Practice Paper (Solved)

QUANTITATIVE APTITUDE

1. Three students try to solve a problem independently with a probability of solving it as $\frac{1}{3}, \frac{2}{5}, \frac{5}{12}$ respectively. What is the probability that the problem is solved ?

(a) — (b) $\frac{7}{30}$

(c) — (d) —

2. From among 36 teachers in a school one principal and one vice principal are to be appointed. In how many ways can this be done ?

(a) 1260 (b) 1250

(c) 1240 (d) 1800

3. A boy has 3 library tickets and 8 books of his interest in the library. Of these 8, he does not want to borrow chemistry part II, unless chemistry part I is also borrowed. In how many ways can he choose the three books to be borrowed ?

(a) 56 (b) 27

(c) 26 (d) 41

4. If the system $2x + 3y - 5 = 0, 4x + ky - 10 = 0$ has an infinite number of solutions, then

(a) k = — (b) k ≠ —

(c) k ≠ 6 (d) k = 6

5. A bag contains 5 red balls and 8 blue balls. It also contains 4 green and 7 black balls. If a ball is drawn at randomly find the probability that it is not green

(a) — (b) —

(c) — (d) —

6. The letters of the word PROMISE are arranged so that no two of the vowels should come together. Find total number of arrangements.

(a) 49 (b) 1440

(c) 7 (d) 1898

7. Surendra, Rajendra and Manindra invested some amount in a business in the ratio of 5 :7 : 6 respectively. In the next year they increased their investments by 26%, 20% and 15% respectively. The profit earned during the second year should be distributed in what ratio among Surendra, Rajendra and Manindra respectively ?

(a) 31 : 27 : 21 (b) 21 : 28 : 23

(c) 26 : 20 : 15

(d) Cannot be determined

(e) None of these

8. Four of the following five parts numbered (i), (ii), (iii), (iv) and (v) are exactly equal. The number of the part which is not equal to the remaining four is your answers.

(i) $36 \times 15 \div 27 \times 13$

(ii) $53 \times 4 \times 64 \div 16 \times 7$

(iii) $328 \div 41 \times 21 + 9 \times 2^3$

(iv) $\sqrt{1024} \times 11 - 16 \times 7$

(v) $17 \times 18 - \sqrt{121} \times 6$

(a) I (b) II

(c) III (d) IV

(e) V

9. A shopkeeper sold an article for Rs. 6,750 after given a discount of 10% on the labelled price. He would have earned a profit of 50%, had there been no discount. What was the actual percentage of profit earned ?

(a) 36 (b) 40

(c) 35

(d) Cannot be determined

(e) None of these

10. From a group of 7 men and 6 women 5 persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many different ways can it be done ?

(a) 756 (b) 735

(c) 564 (d) 645

(e) None of these

11. Which of the following expression are exactly equal in value ?

I. $(3x - y)^2 - (5x^2 - 2xy)$

II. $(2x - y)^2$

III. $(2x + y)^2 - 2xy$

IV. $(2x + 3y)^2 - 8y(2x + y)$

(a) I and II only

(b) I, II and III only

(c) II and IV only

(d) I, II and IV only

(e) None of these

12. Salary of an officer increases every year by 20%. His salary in the year 2001 was Rs. 26,640. What was his salary in 1999?

(a) Rs. 20,000 (b) Rs. 19,028

(c) Rs. 18,500 (d) Rs. 18,840

(e) None of these

13. What approximate value should come in place of the question mark (?) in the following equation ?

$95.975^{3.5} \div 16.001^{3.5} \times 6.002^{1.5} \div 35.99^2 = ?$

(a) 36 (b) 16

(c) 96 (d) 32

(e) 6

14. Mr. Anand deposited a total amount of Rs. 65,000 in three different schemes A, B and C with rates of interest 12 p.c.p.a., 16 p.c.p.a. and 18 p.c.p.a.

respectively and earned a total interest of Rs. 10,180 in one year. If the amount invested in Scheme A was 72% of the amount invested in Scheme 'C', what was the amount invested in Scheme B ?

(a) Rs. 25,000

(b) Rs. 22,000

(c) Rs. 18,000

(d) Cannot be determined

(e) None of these

15. In how many different ways can the letters of the word TRAINER be arranged so that the vowels always come together?

(a) 1440 (b) 120

(c) 720 (d) 360

(e) None of these

16. What will be the value of :

$$\frac{\sqrt{98}-\sqrt{72}+\sqrt{50}}{\sqrt{18}}$$

(a) 6 (b) $\frac{\sqrt{38}}{\sqrt{3}}$

(c) – — (d) 2

17. In a hotel, there are dishonest waiters. One of them takes out one third of the milk from a container full of milk and replaces it with equal quantity of water. A second waiter again takes out one third of the mixture and replaces it with equal quantity of water. The process is repeated by 4 waiters resulting in only 16 litres of milk being left in the container. What is the capacity of the container ?

(a) 81 litres (b) 72 litres

(c) 54 litres (d) 66 litres

18. If $p^2+\frac{1}{p^2}=a$, and $p-\frac{1}{p}=b$ then which of the following is correctly expressed ?

(a) $a - b^2 - 2 = 0$

(b) $a^2 + b = 2$

(c) $a^2 - b^2 = 1$ (d) $a^2 = b^2$

19. If a + b + c = 0, then the value of a(c + a) (a + b) – b(a + b)(b + c) is equal to :

(a) 1 (b) a b c

(c) $\frac{+}{}$ (d) 0

20. A worker earns a 5% raise. A year later, the worker receives a 2.5% cut in pay, and now his salary is Rs. 22702.68. What was his salary to begin with ?

(a) Rs. 22000 (b) Rs. 22176

(c) Rs. 25000 (d) Rs. 22193

21. What will come in place of the question mark (?) in the following series ?

2 3 10 39 172 ?

(a) 704 (b) 885

(c) 785 (d) 804

(e) None of these

22. A man received a cheque in which the rupees were transposed for paise and vice versa. After spending 5 rupees 42 paise, he discovered that he now had exactly six times the value of the correct cheque

amount. What amount should he have received ?

(a) Rs. 6.44 (b) Rs. 3.22

(c) Rs. 18.25 (d) Rs. 8.36

23. If α and β are the roots of the quadratic equation $ax^2 + bx + c = 0$, then the value of $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$ is

(a) $\frac{-3}{2}$ (b) $\frac{-3}{2}$

(c) $\frac{-2}{3}$ (d) $\frac{-2c}{2}$

24. 3 chairs and 2 tables cost Rs. 700, while 5 chairs and 3 tables cost Rs. 1100. What is the cost of 2 chairs and 2 tables ?

(a) Rs. 300 (b) Rs. 350

(c) Rs. 450 (d) Rs. 600

25. If a, b are the two roots of a quadratic equation such that $a + b = 24$ and $a - b = 8$, then the quadratic equation having a and b as its roots is

(a) $x^2 + 2x + 8 = 0$

(b) $x^2 - 4x + 8 = 0$

(c) $x^2 - 24x + 128 = 0$

(d) $2x^2 + 8x + 9 = 0$

26. A sum of money was divided among two persons x and y in the ratio 4 : 5. x received Rs. 5 less than y. What is the total amount of money :

(a) 45 (b) 50

(c) 90 (d) 250

27. Monthly incomes of two persons are in the ratio 5 : 4 and their monthly expenditures are in the ratio of 9 : 7. If each person saves Rs. 500 per month, then what are their monthly incomes ?

(a) Rs. 8000 and Rs. 10000

(b) Rs. 3750 and Rs. 3000

(c) Rs. 5000 and Rs. 4000

(d) None of these

28. Five persons A, B, C, D and E occupy seats in a row such that A and B sit next to each other. In how many possible ways can these five people sit ?

(a) 24 (b) 48

(c) 72 (d) None of these

29. $26 \times 12 \div 8 + ? = 76$

(a) 39 (b) 42

(c) 43 (d) 37

(e) None of these

30. The MSEB electricity bills are calculated in the following manner. The change in meter reading for the month is rounded off to the next highest multiple of 10. The result is multiplied by 55 paise, and the sum is rounded off to the next rupee. If the reading last month was 17385 units and this month it is 18293 units, what is the bill for this month ?

(a) Rs. 501 (b) Rs. 495

(c) Rs. 500 (d) Rs. 505

31. A gambler pays Rs. 3 and gets to throw a dice. He receives an

amount equal to the number that the top face of the dice shows. If the gambler keeps on playing the game, how much does he win per throw, in the long run ?

(a) 50 Ps. (b) Rs. 1

(c) –50 Ps. (d) Rs. 0

32. **$|P-10| = 12$ & $|4J-10| = 6$. What is maximum value of $\frac{P}{J}$.**

(a) –11 (b) 22

(c) –2 (d) —

33. **If $x + y > 5$ and $x - y > 3$, then which of the following gives all possible values of x ?**

(a) $x > 3$ (b) $x > 4$

(c) $x > 5$ (d) $x < 5$

34. **$136 \times 25 \div 16 \times ? = 2550$**

(a) 12 (b) 22

(c) 20 (d) 18

(e) None of these

35. **The probability of rain on day 1 is 0.2 and the probability on day 2 is 0.3. What is the probability of raining on both the days?**

(a) 0.2 (b) 0.1

(c) 0.06 (d) 0.25

36. **Three – fourths of a tank is full of water. If 5 litres are added to it then four–fifths of the tank becomes full. What is the capacity of the tank?**

(a) 75 litres (b) 80 litres

(c) 100 litres (d) 120 litres

37. **There are 10 pairs of socks in a drawer. What is the minimum number of socks that a person should pull out from the drawer ensure that he gets at least 2 matching pairs of socks ?**

(a) 12 (b) 11

(c) 5 (d) 10

38. **A painting show drew crowds which doubled in number each day. If the show opened on Monday and the number of spectators on Saturday was 6400, what was the number on the opening day?**

(a) 100 (b) 200

(c) 800 (d) 80

39. **15 chairs and 2 tables cost Rs. 4,000. Find the cost of 12 chairs and 2 tables, if the cost of 10 chairs be equal to that of 5 tables.**

(a) Rs. 4,000 (b) Rs. 4,200

(c) Rs. 3,900 (d) Rs. 3,600

40. **5 chairs and 2 tables cost Rs. 1,080. The cost of 2 chairs is equal to that of a table. Find the cost of 2 chairs and 5 tables.**

(a) Rs. 1,440 (b) Rs. 1,480

(c) Rs. 1,380 (d) Rs. 1,420

41. **An employee spends 30% of his salary on food and donates 3% of his salary. If he spends Rs. 231 on these two items what is his salary ?**

(a) Rs. 1250 (b) Rs. 700

(c) Rs. 630 (d) Rs. 940

42. The mean annual salary paid to all the staff members of a company was Rs. 5000. The mean annual salary paid to male and female staff were Rs. 5200 and Rs. 4500 respectively. Determine the number of male and female staff members of the company.

(a) 80, 20 (b) 70, 30

(c) 60, 40 (d) 40, 60

43. A man has some hens & cows. If the number of heads be 48 and the number of feet equals 140, the number of hens will be

(a) 26 (b) 24

(c) 23 (d) 22

44. If $\sqrt{a^b} = 5b + a^2$, then (a, b) could be

(a) (3, 4) (b) (2, 12)

(c) (4, 18) (d) (6, 4)

45. How many bricks are required to build a wall of 15 metres length, 12 metres height and 20 cm thickness, if the brick is 36 cm long, 25 cm wide and 10 cm thick ?

(a) 2000 (b) 4000

(c) 12000 (d) None of these

46. Three students try to solve a problem independently with a probability of solving it as $\frac{2}{8}, \frac{4}{5}, \frac{3}{4}$ respectively. What is the probability that the problem is solved ?

(a) $\frac{3}{20}$ (b) —

(c) — (d) –

47. A student on his birthday distributed on an average 5 chocolates per student. If on the arrival of the teacher and the headmaster to whom the student gives 10 and 15 chocolates respectively, the average chocolate distributed per head increases to 5.5, then what is the strength of the class?

(a) 28 (b) 30

(c) 32 (d) None of these

48. Find the value of

$$\frac{0.2\times0.2\times0.2+0.02\times0.02\times0.02}{0.4\times0.4\times0.4+0.04\times0.04\times0.04}+\frac{0.67\times0.67\times0.67-0.001}{0.67\times0.67+0.067+0.01}$$

(a) 4.87 (b) 1.07

(c) 0.067 (d) 0.002

49. Find the value of

$$\frac{0.03\times0.03+0.01\times0.01-0.02\times0.03}{0.02}\div\left(\frac{3}{8}+\frac{1}{2}\text{ of }\frac{3}{16}\right)$$

(a) 0.447 (b) 8.04

(c) 0.0427 (d) 0.012

50. Simplify : $\sqrt{\frac{0.289}{0.00121}}+\frac{\sqrt{24}+\sqrt{216}}{\sqrt{96}}$

(a) 12.45 (b) 16.54

(c) 18.90 (d) 17.45

51. A pack of 52 cards is distributed amongst 4 players. The one to

receive the set with the lowest sum wins

(A = 1, J = 11, Q = 12, K = 13).

What is the least total with which one can win ?

(a) 40 (b) 31

(c) 28 (d) 24

52. If every 2 out of 3 readymade shirts need alterations in the collar, every 3 out of 4 need alterations in the sleeves, and every 4 out of 5 need it in the body, how many alterations will be required for 60 shirts ?

(a) 123 (b) 133

(c) 143 (d) 24

53. Which of the following does not belong to the group ?

10 , 11 , 18, 36, 74

(a) 10 (b) 11

(c) 18 (d) 36

54. Tulsi had a children's party and bought two mangoes for each child. However, a quarter of the kids invited did not come. 25 boys came and the surplus provided just one extra mango for each girl. How many mangoes did Tulsi buy ?

(a) 200 (b) 132

(c) 150 (d) 128

55. If x is a three–digit number and y is a number obtained by permuting the digits of x in any manner, then (x – y) is always divisible by :

(a) 4 (b) 6

(c) 9 (d) 12

56. If $x^{1/3} + y^{1/3} + z^{1/3} = 0$, then :

(a) $x + y + z = 0$

(b) $(x + y + z)^3 = 27\ xyz$

(c) $x + y + z = 3\ xyz$

(d) $x^3 + y^3 + z^3 = 0$

57. A crown, made of gold, silver, copper and brass weighs 9.725 kg. The weight of the gold and silver together is 4 kg and the weight of the gold and copper 4.5 kg and of the gold and brass 3.6 kg. What is the weight of gold in the crown ?

(a) 1.2500 kg (b) 2.6575 kg

(c) 1.1875 kg (d) 2.3705 kg

58. A bag contains 3 white balls and 2 black balls. Another bag contains 2 white balls and 4 black balls. A bag and a ball are picked at random. The probability that the ball will be white is

(a) — (b) —

(c) — (d) —

59. One hundred identical coins each with probability p of showing up heads are tossed. If $0 < p < 1$ and the probability of heads showing on 50 coins is equal to that of heads on 51 coins, then the value of p is

(a) – (b) —

(c) —— (d) ——

60. Two dice are tossed. The probability that the total score is a prime number is

(a) – (b) —

(c) – (d) –

61. The value of $\left(\frac{1}{4}\right)^{-2}$ is

(a) 2 (b) – –

(c) – — (d) 16

62. The volume of a cube is V. The total length of its edges is

(a) 6 $V^{1/3}$ (b) 8 $\sqrt{V}$

(c) 12 $V^{2/3}$ (d) 12 $V^{1/3}$

63. A boy was asked to write $2^5 \times 9^2$, but he wrote 2592. The numerical difference between the two is

(a) 0 (b) 1

(c) 2 (d) 3

64. If $P = \frac{x^2-36}{x^2-49}$ and $Q = \frac{x+6}{x+7}$, then the value of $\frac{P}{Q}$ is

(a) $\frac{--}{-}$ (b) $\frac{--}{+}$

(c) $\frac{-7}{+}$ (d) $\frac{x+6}{x-7}$

65. With the same data as for the previous question, what is the probability that the next program will run correctly after the third run, but not earlier ?

(a) — (b) —

(c) — (d) —

66. A number is greater than the square of 44 but smaller than the square of 45. If one part of the number is the square of 6 and the number is the multiple of 5, then find the number.

(a) 1940 (b) 2080

(c) 1980

(d) Cannot be determined

(e) None of these

67. Rajesh solved 80 per cent of the questions in an examination. If out of 41 questions solved by Rajesh 37 questions are correct and of the remaining questions out of 8 questions 5 questions have been solved by Rajesh correctly then find the total number of questions asked in the examination ?

(a) 75 (b) 65

(c) 60

(d) Cannot be determined

(e) None of these

68. What was the day on April 6, 2001?

(a) Friday (b) Saturday

(c) Thursday (d) Sunday

69. Monthly incomes of two persons are in the ratio 5 : 4 and their monthly expenditures are in the ratio of 9 : 7. If each person saves Rs. 500 per month, then what are their monthly incomes ?

(a) Rs. 8000 and Rs. 10000

(b) Rs. 3750 and Rs. 3000

(c) Rs. 5000 and Rs. 4000

(d) None of these

70. Income of C is 20% more than that of B and income of B is 25% more than that of A. Find out by how much % is the income of C more than that of A.

(a) 25% (b) 75%

(c) 50% (d)100%

71. Spending Rs. 1,200 daily for 7 days, I ran into a debt which was cleared in 9 days after I reduced my daily expense to Rs. 880. Find my daily income.

(a) Rs. 1,000 (b) Rs. 1,020

(c) Rs. 1,040 (d) Rs. 1,025

72. The ratio of incomes of A and B is 5 : 3 and that their expenditures is 8 : 5. If their savings are in the ratio of 2 : 1 and their total saving is Rs. 3,600, then the income of A is :

(a) Rs. 12,000 (b) Rs. 7,200

(c) Rs. 7,800 (d) Rs. 9,100

73. $1.5 \times 1.2 - 0.06 \times 0.5 = ?$

(a) 1.77 (b) 17.97

(c) 1.797 (d) 17.77

(e) None of these

74. 76.59 + 129.052 – 38.314 = ? + 45.72

(a) 121.068 (b) 121.608

(c) 120.068 (d) 120.608

(e) None of these

75. $336 \div 12 \times 15 - ? = 138$

(a) 140 (b) 233

(c) 420 (d) 282

(d) None of these

76. $168 \times 15 \div 24 \times 12 = ?$

(a) 1160 (b) 8.75

(c) 1260 (d) 105

(e) None of these

77. 4410 ÷ 45 ÷ 7 = ?

(a) 98 (b) 686

(c) 14 (d) 70

(e) None of these

78. 7586 + 11254 – ? = 8976

(a) 9846 (b) 9764

(c) 9784 (d) 9864

(e) None of these

79. 1111 + 12121 + 1020102 = ?

(a) 1303334 (b) 1033344

(c) 103334 (d) 1033334

(e) None of these

80. There are two grades A and B of workers in a workshop. Every worker contributes as many rupees as there are workers of his own category. If the total amount contributed is Rs. 196 including Rs. 16 contributed by the owner of the workshop, what is the total

number of workers in that workshop ?

(a) 18 (b) 14 (c) 12

(d) 10 (e) None of these

81. $\frac{\sqrt{196}}{14} \times \frac{17}{\sqrt{289}} \times \frac{78}{\sqrt{169}} = ?$

(a) 1 (b) 2 (c) 6

(d) 4 (e) 13

82. $\frac{?}{\sqrt{.25}} = 250$

(a) 500 (b) 125 (c) 5

(d) 0 (e) 100

83. $\frac{189}{\sqrt{a}} = 1.89$

(a) 10 (b) 100 (c) 1000

(d) 10000 (e) None of these

84. $\sqrt{12} + \sqrt{24}$ equals

(a) $2\sqrt{6} + 2\sqrt{3}$ (b) $\sqrt{36}$

(c) $\sqrt{288}$ (d) $6\sqrt{2}$

85. Find $\sqrt{100} + \sqrt{49}$

(a) $\sqrt{149}$ (b) 17 (c) $\sqrt{490}$

(d) $\sqrt{14} + \sqrt{10}$ (e) None of these

86. $\sqrt{0.00004761}$ equals

(a) 0.069 (b) 0.0069

(c) 0.00069 (d) 0.0609

87. If $x = \frac{\sqrt{3}}{2}$, find the value of

$$\frac{\sqrt{1+x} + \sqrt{1-x}}{\sqrt{1+x} - \sqrt{1-x}}$$

(a) $\sqrt{5}$ (b) $\sqrt{3}$

(c) $\sqrt{2}$ (d) $\sqrt{4}$

88. A person wants to divide a sum of Rs. 3,90,300 between his two sons who are 13 and 15 years of age respectively in such a way that their shares, if invested at 4% per annum compound interest, should produce the same amount when they become 18 years of age. Find the share of each.

(a) 187500, 202800

(b) 178500, 183000

(c) 199400, 194500

(d) 168890, 195600

89. A, B and C invested Rs. 26,000, Rs. 34,000 and Rs. 10,000 respectively in a business. They earn a profit of Rs. 3500. B's share of profit is

(a) Rs. 1200 (b) Rs. 1500

(c) Rs. 1700 (d) Rs. 1900

90. Mr. Rai decided to distribute his income among the members of his family. He gave 50% to his wife, 35% of the remaining to both of his sons, and the balance of Rs. 6,750 was deposited by him in the bank. How much amount was received by his wife ?

(a) Rs. 23,200 (b) Rs. 45,000

(c) Rs. 22,500 (d) Rs. 13,500

(e) None of these

91. If $a \otimes b = (a \times b) + b$, then $5 \otimes 7$ equals to

(a) 12 (b) 35

(c) 42 (d) 50

92. 24% of 250 + ?% of 240 = 120

(a) 25 (b) 40
(c) 30 (d) 45
(e) None of these

93. 22% of ? + 30% of 420 = 192
(a) 330 (b) 350
(c) 200 (d) 280
(e) None of these

94. 75 × 18 + ?% of 150 = 1380
(a) 25 (b) 20
(c) 12 (d) 16
(e) None of these

95. Subhash bought 20 kg of tea at the rate of Rs. 30 per kg and 30 kg at the rate of Rs. 25 per kg. He mixed the two and sold the mixture at the rate of Rs. 22.50 per kg. What was his loss in the transaction ?
(a) Rs. 200 (b) Rs. 225
(c) Rs. 175 (d) Rs. 200.25

96. A boy goes to school with the speed of 3 km/hr and returns with a speed of 2 km/hr. If he takes 5 hours in all, the distance in kms between the village and the school is
(a) 6 (b) 7
(c) 8 (d) 9

97. Gold is 19 times heavy as water and copper 9 times as heavy as water. The ratio in which these two metals be mixed so that the mixed so that the mixture is 15 times as heavy as water, is
(a) 1 : 2 (b) 2 : 3
(c) 3 : 2 (d) 19 : 135

98. $(1502)^2 - (1498)^2$ = ?
(a) 12,000 (b) 16,000
(c) 22,56,004 (d) 22,560

99. $\frac{3}{5}$ of 480 ÷ 8 + 8^2 = ?
(a) 120 (b) 100
(c) 36 (d) 44

100. Value of 64 ÷ 8 ÷ 4 ÷ 2 is
(a) 1 (b) 8
(c) 16 (d) 24
(e) None of these

101. If a : b = 2 : 3, b : c = 5 : 7, then a : b : c is
(a) 2 : 3 : 7 (b) 2 : 5 : 7
(c) 10 : 15 : 21 (d) 2 : 15 : 7
(e) None of these

102. If two numbers are in the ratio 5 : 7and their least common multiple is 315, then their product is
(a) 2385 (b) 2538
(c) 2358 (d) 2835

103. If x : y = 3 : 4, y : z = 5 : 6 and z : w = 2 : 3, then x : w equals
(a) 5 : 3 (b) 3 : 3
(c) 5 : 12 (d) 7 : 3

104. Subtract – 13 from 28 – 5 + 5.
(a) 51 (b) 53
(c) 56 (d) 58
(e) None of these

105. Add 7.007, 70.7 and 7.007
(a) 84.074 (b) 84.714
(c) 84.741 (d) 80.714

106. Which of the following numbers is a multiple of 8 ?

(a) 923862 (b) 923962

(c) 923972 (d) 923872

107. If 14% of a number is 105, then find the number.

(a) 715 (b) 705

(c) 735 (d) 750

108. Three pipes fill a tank separately in 10 minutes, 20 minutes and 30 minutes respectively. An outlet pipe can empty it in 15 minutes when no water flows in. If all the pipes are opened, when the tank is empty, then how long, in minutes, will it take to fill the tank ?

(a) $9\frac{1}{7}$ (b) $8\frac{4}{7}$

(c) $7\frac{1}{2}$ (d) $6\frac{2}{3}$

109. A number is multiplied by its one–third to get 192. Find the number.

(a) 16 (b) 20

(c) 24 (d) 28

110. The value of

$$\frac{0.125+0.027}{0.5\times 0.5+0.09-0.15}$$ **is**

(a) 1 (b) 0.2

(c) 0.08 (d) 0.8

111. Evaluate : $\frac{\sqrt{0.01+\sqrt{0.0064}}}{0.01\times 0.3}$

(a) 1 (b) 10

(c) 100 (d) 1000

112. Express $\frac{2}{3}$ of $\frac{1}{4}$ of Rs. 25.20 as a fraction of $1\frac{1}{2}$ of Rs. 36.

(a) $\frac{7}{90}$ (b) $\frac{11}{90}$

(c) $\frac{5}{8}$ (d) $\frac{5}{42}$

113. Simplify :

$$1+2\left[3-\left\{1+\left(2-\overline{\frac{1}{2}-\frac{5}{2}}\right)\right\}\right]$$

(a) 2 (b) 1

(c) –3 (d) 5

114. The least of the following $0.2, (.2)^2, 0.\overline{2}, 1\div 0.2$ is

(a) $(.2)^2$ (b) 0.2

(c) $0.\overline{2}$ (d) $1\div 0.2$

115. 5% of 5% of Rs. 100 is

(a) Re. 0.25 (b) Re. 0.50

(c) Rs. 10 (d) Rs. 25

116. The value of

$$\sqrt{6+\sqrt{6+\sqrt{6+\sqrt{6+\ldots}}}}$$ **is**

(a) 2 (b) 5

(c) 4 (d) 3

117. A cistern is normally filled with water in 10 hours but takes 5 hours longer to fill because of a leak in its bottom. If the cistern is full, then the leak will empty the cistern in

(a) 20 hours (b) 40 hours

(c) 50 hours (d) 30 hours

118. Taps A and B can fill a bucket in 12 minutes and 15 minutes respectively. If both are opened and A is closed after 3 minutes, how much further time would it take for B to fill the bucket ?

(a) 8 min 5 sec. (b) 8 min 15 sec.

(c) 7 min 45 sec. (d) 7 min 15 sec.

119. A and B enter into a partnership investing Rs. 12,000 and Rs. 16,000 respectively. After 8 months, C also joins the business with a capital of Rs. 15,000. The share of C in a profit of Rs. 45,600 after two years is

(a) Rs. 12,000 (b) Rs. 14,400

(c) Rs. 19,200 (d) Rs. 21,200

(e) None of these

120. Simplify $\sqrt{\dfrac{(12.12)^2-(8.12)^2}{(0.25)^2+(0.25)(19.99)}}$

$$+\frac{\left[\left(8^{-3/4}\right)^{5/2}\right]^{8/15}\times 16^{3/4}}{\sqrt[3]{\left[\left((128)^{-5}\right)^{3/7}\right]^{-1/5}}}$$

(a) $4\frac{1}{2}$ (b) $6\frac{1}{2}$

(c) $3\frac{2}{3}$ (d) $8\frac{1}{2}$

121. Find the value of

$$\left(28+10\sqrt{3}\right)^{\frac{1}{2}}-\left(7-4\sqrt{3}\right)^{\frac{1}{2}}$$

(a) 5 (b) 3

(c) 8 (d) 6

ANSWERS & SOLUTIONS

Ans.1.(a) Let three students are A, B and C $\Rightarrow$ Probability that the given problem cannot be solved by A, B & C is

$$\left(\frac{-}{-}\right)\left(\frac{-}{-}\right)\left(\frac{-}{-}\right)=\frac{-}{-}\times\frac{-}{-}\times\frac{-}{-}=\frac{-}{-}$$

$\Rightarrow$ Probability that the problem is solved

$= 1 - \left(\frac{-}{-}\right) = \mathbf{\frac{23}{30}}$

Ans.2.(a) One principal can be appointed out of 36 teachers = $^{36}C_1$, 36 ways.

For each way of doing so, one vice principal can be appointed out of the remaining 35 teachers in $^{35}C_1 = 35$ ways

Hence, two posts, together can be filled in $36 \times 35 =$ **1260 ways.**

Ans.3.(c) There are two ways of borrowing books

(a) When there is no chemistry book in this case, 3 books are to be selected from the remaining 6 books :

This can be done in = $^6C_3$

$= \frac{\times\ \times}{\times\ \times} =$ **20 ways**

(b) When there is a chemistry 1 and chemistry 11 books. In this case one book can be selected from the remaining 6 books in = $^6C_1 = 6$ ways. Hence, total number of ways = 20 + 6 = **26**

Ans.4.(d) The equation is same only if **k = 6**

(by multiplying the first equation by 2).

Ans.5.(a) Probability of not given

$$\frac{+\ +}{+\ +\ +} = \frac{}{} = -$$

Ans.6.(b) $7! = ({}^3C_2 \times 6! \times 2! + 5!)$

$= 5040 - (3 \times 720 \times 2 + 120) = 1440.$

Ans.7.(b) In the second year the investment are :

$5 \times 1.26 : 7 \times 1.20 : 6 \times 1.15$

$= 6.3 : 8.4 : 6.9$ **$= 21 : 28 : 23.$**

Ans.8.(a) $36 \times \frac{}{} \times 13 = 260.$

All other parts equal 240.

Ans.9.(c) MP $= 6750 \times \frac{100}{90} = 7500.$

Since profit = 50%, C.P. $= 7500 \times \frac{}{}.$

Profit % $= \frac{}{} \times 100$ **$= 35\%$.**

Ans.10.(a) Since there are at least 3 men in the committee, we can have 3 cases, either 3 ***or*** 4 ***or*** 5 men.

(i) ${}^7C_3 \times {}^6C_3$ **(ii)** ${}^7C_4 \times {}^6C_1$

(iii) ${}^7C_5 \times {}^6C_0 = 525 + 210 + 21$ **$= 756$**

Ans.11.(c)

I. $9x^2 + y^2 + 6xy - 5x^2 + 2xy$

$= 4x^2 + y^2 + 8xy$

II. $(2x - y)^2 = 4x^2 + y^2 - 4xy$

III. $4x^2 + y^2 + 4xy - 2xy$

$= 4x^2 + y^2 + 2xy$

IV. $4x^2 + 9y^2 + 12xy - 16xy - 8y^2$

$= 4x^2 + y^2 - 4xy$

Hence only **II and IV are equal.**

Ans.12.(c) Salary 2 years back

$= 26{,}640 \times \frac{100}{120} \times \frac{100}{120} = 18{,}500.$

Ans.13.(e) Given expression

$$= \frac{96^3 \times \sqrt{96}}{16^3 \times \sqrt{16}} \times \frac{6 \times \sqrt{6}}{6^4}$$

simplyfying the expression,

we get its value as 6.

Ans.14.(b) If C = 100, A = 72.

Hence ratio = 25 : 18.

Then $18x + 25x + y = 65{,}000$ and $12\%\ (18x) + 18\%\ (25x) + 16\%\ (y) = 10{,}180.$

Solving the two equations,

we get **$y = 22{,}000.$**

Ans.15.(c) Country the vowels as one, we have 5! ways.

Since the vowels can be arranged in 3! ways, the reqd. answer is $5! \times 3!$ **$= 720.$**

Ans.16.(d) Reduce to the base of $\sqrt{2}$ by factorisation and solve.

Ans.17.(a) Milk left after 4th operation/ Whole quantity of container

$= \left(\frac{}{}\right)^4 = \frac{}{x} \Rightarrow$ **$x = 81$ litres.**

Ans.18.(a) $\left(\frac{}{} - \frac{1}{}\right)^2 = \mathbf{P^2 + \frac{1}{P^2} - 2.}$

Hence **$b^2 = a - 2.$**

Ans.19.(d)

$a(c + a)(a + b) - b(a + b)(b + c)$

$= abc - abc =$ **$0.$**

Ans.20.(b) Suppose the salary was Rs. 100, to begin with.

$\Rightarrow 100 + 5\% = 105$

$\Rightarrow 105 - 2.5\% = 102.375$

If the present salary is Rs. 102.375, then the salary in the beginning was Rs. 100.

If the present salary Rs. 22702.68, then the salary the beginning was

——— × 22702.68 **= 22176.**

Ans.21.(b) The sequence in the given series is

× 1 + 1^2, × 2 + 2^2, × 3 + 3^2, × 4 + 4^2, × 5 + 5^2.

Ans.22.(a) The cheque was received for Rs. 44.06. After spending Rs. 5.42, he had Rs. 38.64, which is 6 times of Rs. 6.44.

∴ He should have received Rs. 6.44.

Ans.23.(b) $\alpha + \beta = -\frac{b}{a}$ $\alpha\beta =$ —

$\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta$

$= \frac{^2}{2} - \frac{2}{—} = \frac{^2 - 2}{2}$

$\Rightarrow \frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha} = \frac{\alpha^3 + \beta^3}{\alpha\beta}$

$= \frac{(\alpha+\beta)(\alpha^2+\beta^2-\alpha\beta)}{\alpha\beta}$

$= \frac{\left(-\frac{b}{a}\right)\left(\frac{b^2-2ac}{a^2} - \frac{c}{a}\right)}{\frac{c}{a}}$

$\frac{-b\,(b^2 - 3\,a\,c)}{a^3} \times \frac{a}{c} = \frac{abc - b^3}{a^2c}$

Ans.24.(d) 3C +2T = 700

5C + 3T = 1100

$\Rightarrow$ 9C + 6T = 2100

$\Rightarrow$ 10C + 6T = 2200

$\Rightarrow$ C = 100, T = 200

$\Rightarrow$ 2C + 2T = 200 + 400 = **600.**

Ans. 25.(c) a + b = 24, a – b = 8

$\Rightarrow$ a = 16, b = 8 $\Rightarrow$ ab = 128

$\Rightarrow$ Required equation is the one whose sum of the roots is 24 and product of the roots is 128.

i.e. $x^2 - 24x + 128 = 0$

Ans.26.(a) $\frac{}{} = \frac{4}{5}$ – 5 , x = y

$\Rightarrow$ x = ——, —— = y – 5

$\Rightarrow$ y = 25, x = 20 $\Rightarrow$ x + y = **45**

= Total amount

Ans.27.(c) Let the monthly incomes of two persons be 5I and 4I and their monthly expenditures be 9E and 7E respectively.

$\Rightarrow$ 5I – 9E = 500

$\Rightarrow$ 4I – 7E = 500

$\Rightarrow$ I = 1000, E = 500

$\Rightarrow$ Monthly incomes of the two persons are **Rs. 5000 and Rs. 4000**.

Ans.28.(b) 4! × 2 ways,

i.e. 24 × 2 = **48 ways.**

Ans.29.(d) 26 × 12 ÷ 8 + ? = 76

$\Rightarrow 26 \times \frac{12}{8}$ + ? = 76

$\Rightarrow$? = 76 – 39 = **37**

Ans.30.(a) Change in meter reading

= 18293 – 17385 = 908 units.

Rounded off to 910 units.

Therefore Bill is (910)(55) = 50050 paise,

or Rs. 500.50.

This is rounded off to **Rs. 501.**

Ans.31.(a) In the long run, every number will have occurred roughly the same number of times.

Therefore for every 6 throws, each number from 1 to 6 would have occurred. Therefore the gambler would have won 1 + 2 + 3 + 4 + 5 + 6 ***i.e.*** Rs. 21.

He would have spent Rs. (6 × 3) = 18. Therefore gain is Rs. 3 in 6 throws,

***i.e.* 50 paise per throw.**

Ans.32.(b) — max ⇒ P max, J min

[P – 10] = 12 ⇒ P = 22 ***or*** – 2

[4J – 10] = 6 ⇒ J = 4 ***or*** 1.

So max. value of — is **22**.

Ans.33.(b) x + y > 5

x – y > 3, 2x > 8, **x > 4**.

Ans.34.(a) 136 × 25 ÷ 16 × ? = 2550

$\Rightarrow 136 \times \frac{25}{16} \times ? = 2550$

$\Rightarrow ? = \frac{2550 \times 16}{136 \times 25} =$ **12**

Ans.35.(c) P(A) = 0.2, P(B) = 0.3

P(A ∩ B) = P(A).P(B)

= 0.2 × 0.3 = **0.06**

Ans.36.(c)

Let the capacity of tank = x liter.

— x + 5 = — x ⇒ —— – —— = –5

—— = –5 ⇒ $\frac{-x}{20}$ = –5

⇒ x = **100**

Ans.37.(c) x (5) — = 5

Ans.38.(b) Let the no. of crowds on the opening day = x

Monday = x, Tuesday = 2x

Wednesday = 4x, Thursday = 8x

Friday = 16x,

Saturday = 32x = 6400

⇒ x = —— = **200.**

Ans.39.(c) Let cost of a chair and a table be Rs. x and y respectively.

Then, 15x + 2y = 4000 .....(i)

10x = 4y ....(ii)

Solving (i) and (ii)

x = 200, y = 500

12x + 3y = 12 × 200 + 3 × 500

= **Rs. 3900**

Ans.40.(a) 5x + 2y = 1080 .....(i)

2x = y ***or*** 2x – y = 0 .....(ii)

Solving (i) and (ii),

x = 120, y = 240.

⇒ 2x + 5y = 2 × 120 + 5 × 240

= **Rs. 1440**.

Ans.41.(b) Let his salary = Rs. x

Expenditure on food

= x × —— = Rs. ——

Donation = × —— = ——

⇒ —— + —— = 231

$\Rightarrow$ $\frac{+}{\qquad} = 231$

$\Rightarrow$ $\frac{}{} = 231$

$\Rightarrow$ $33x = 231 \times 100$

$\Rightarrow$ $x = 231 \times \frac{}{} =$ **700.**

Ans.42.(b) Let the of ratio of male and female is K : 1

$\Rightarrow 5200\ K + 4500 = (K + 1) \times 5000$

$\Rightarrow 5200\ K + 4500 = 5000K + 5000$

$\Rightarrow 5200\ K - 5000K = 5000 - 4500 = 500$

$200\ K = 500 \Rightarrow K = \frac{}{} = -$

$K : 1 = - : 1 = 5 : 2$

$= 70 : 30 =$ **70, 30**

Ans.43.(a) Let No. of hens = x

$\Rightarrow$ No. of cows = (48 – x)

$\Rightarrow 2x + 4\ (48 - x) = 140$

$\Rightarrow 2x + 192 - 4x = 140$

$\Rightarrow -2x = 140 - 192 = -52$

$\Rightarrow x = \frac{--}{} =$ **26**

Ans.44.(b) Put a = 2, b = 12 in

$\sqrt{\ b\ } = 5b + a^2$

$\Rightarrow \sqrt{\ 12\ } = 5 \times 12 + 4 = 64$

$\Rightarrow 2^6 = 64$, which is true.

Ans.45.(b) No. of bricks required

$= \frac{\times \quad \times}{\times \quad \times} =$ **4000**

Ans.46.(a) $- \times - \times - = \frac{}{} = \frac{}{}$

Ans.47.(a) Suppose strength of the class = x $\Rightarrow 5x + 10 + 15 = 5.5(x + 2)$

$\Rightarrow 0.5x = 14 \Rightarrow$ **x = 28**

Ans.48.(b) Given expression

$$= \frac{1}{2} + \frac{(0.67)^3 - (0.1)^3}{(0.67)^2 + 0.67 \times 0.1 + (0.1)^2}$$

$= - + (0.67 - 0.1)$

$[\because a^3 - b^3 = (a - b)(a^2 + b^2 + ab)]$

$= 0.5 + 0.57 =$ **1.07**

Ans.49.(c) Given expression

$= \frac{\quad^{\prime 2} + (\quad)^2 - \times \quad \times}{\div \left(\frac{3}{8} + \frac{3}{32}\right)}$

$$= \frac{(0.03 - 0.01)^2}{0.02} \times \frac{32}{15} = \frac{0.02 \times 32}{15}$$

$$= \frac{0.64}{15} = \frac{64}{1500} = \frac{16}{375} =$$ **0.0427**

Ans.50.(d) Given expression

$$= \sqrt{\frac{28900000}{121000}} + \frac{\sqrt{24} + \sqrt{24 \times 9}}{\sqrt{96}}$$

$$= \frac{170}{11} + \frac{4\sqrt{24}}{2\sqrt{24}} = \frac{170}{11} + 2 = \frac{192}{11} =$$ **17.45**

Ans.51.(c) Required number

$= (4 \times 1) + (4 \times 2) + (4 \times 3) + (1 \times 4)$

$= 4 + 8 + 12 + 4 =$ **28.**

Ans.52.(b) Total number of alteration for 60 shirts

$= [- \times 60 + - \times 60 + - \times 60] =$ **133.**

Ans.53.(d) $10 = 10 + 0^3$

$\Rightarrow 11 = 10 + 1^3 \Rightarrow 18 = 10 + 2^3$

$\Rightarrow 36 = 10 + ?^3$

$\Rightarrow 74 = 10 + 4^3$

The number in the series at position 4 must be $10 + 3^3 = 37$.

Therefore the number 36 does not belong to the group.

Ans.54.(a) Let number of children = x. So number of mangoes purchased = 2x.

Number of children present

= x – — = —.

Number of girls = — – 25.

Now by the question,

$$\left(\frac{3x}{4} - 25\right) \times 3 + (25 \times 2) = 2x$$

$\Rightarrow$ x = 100. So the number of mangoes purchased = **200**.

Ans.55.(c) Suppose the hundred's, ten's and unit's places of x be a, b, c respectively. Make these digits as c, b, a. Difference of numbers

= (100a + 10b + c) – (100c + 10b + a)

= 99 (a – c), which is divisible by **9** but none of **4, 6, 12.**

Ans.56.(b) Using a + b + c = 0

$\Rightarrow a^3 + b^3 + c^3 = 3abc$,

we get, $x^{1/3} + y^{1/3} + z^{1/3} = 0$

$\Rightarrow x + y + z = 3x^{1/3}\, y^{1/3}\, z^{1/3}$

$\Rightarrow$ **$(x + y + z)^3 = 27\, xyz$.**

Ans.57.(c) Given that the crown made of gold, silver, copper and brass and weighs 9.725 kg,

i.e. G + S + C + B = 9.725 .....(i)

where G = part of gold in crown

S = part of silver in crown

C = part of copper in crown

B = part of brass in crown

Again by the condition of the question :

G + S = 4 kg .....(ii)

G + C = 4.5 kg .....(iii)

G + B = 3.6 kg .....(iv)

add (ii) + (iii) + (iv)

3G + S + C + B = 12.1 kg

2G + 9.725 = 12.1 $\Rightarrow$ 2G = 2.375

$\Rightarrow$ **G = 1.1875 kg**.

Ans.58.(d) Prob. that bag A is drawn = — . Prob that white ball is drawn from bag A = $— \times \frac{3}{5} = \frac{3}{10}$

Prob. that bag B is drawn = $\frac{1}{2}$

Prob. that white ball is drawn from bag B = $\frac{1}{2} \times \frac{2}{6} = \frac{1}{6}$.

Prob. that white ball is drawn either from bag A ***or*** from bag B

$$= \frac{3}{10} + \frac{1}{6} = \mathbf{\frac{7}{15}}$$

Ans.59.(a) $P^{50}\,(1 - p)^{50} = P^{51}\,(1–P)^{49}$

$\Rightarrow$ P = $\mathbf{\frac{1}{2}}$

Ans.60.(b) Total score will be a prime number in 15 ways out of 36 :

(1,1), (1,2), (1,4), (1,6), (2,1),

(2,3), (2,5), (3,2), (3,4), (4,1),

(4,3), (5,2), (5,6), (6,1), (6,5).

Hence, the required probability $= \frac{15}{36} = \frac{5}{12}$

Ans.61.(d) $\left(\frac{1}{4}\right)^{-2} = \left(\frac{4}{1}\right)^{2}$ **= 16**

Ans.62.(d) There are 12 edges in the cube, Volume = V.

Each edge = $V^{1/3}$.

Total length of the edges = **$12\ V^{1/3}$.**

Ans.63.(a) $2^5 \times 9^2 = 32 \times 81 = 2592$

Ans.64.(a) $\frac{P}{Q} = \frac{x^2-36}{x^2-49} \times \frac{x+7}{x+6} = \mathbf{\frac{x-6}{x-7}}$.

Ans.65.(b) $-\left(\frac{-}{} + \frac{}{} + \frac{-}{}\right) = \mathbf{\frac{3}{10}}$

Ans.66.(c) Let the number be N

$\Rightarrow$ According to the question,

$(44)^2 < N < (45)^2 \Rightarrow 1935 < N < 2025$

Therefore, the required number would be any number between 1937 and 2025.

But from the question it is clear that the required number is the factor of 6 and the multiple of 5. So we have to find out the number between 1937 and 2025 which is divisible by both 36 and 5.

$6^2 = 36$

LCM of 36 and 5 = $36 \times 5 = 180$

$180 \times 10 = 1800$

$180 \times 11 = 1980$

Thus the required no. is **1980**.

So, Answer is (c).

Ans.67.(b) Let the total number of questions asked in examination be n.

$\Rightarrow$ No. of correct answer

= 80% of n = $\frac{-}{}$ n

Now, according to the question,

$37 + (n-4) \times \frac{-}{} = \frac{-}{}$

or, $37 + \frac{-}{} - \frac{-}{} = \frac{-}{}$

or, $37 - \frac{-}{} = \frac{-}{} - \frac{-}{}$

or, $\frac{-}{} = \frac{n-}{} \frac{n}{}$

or $\frac{91}{8} = \frac{7n}{40}$

$\Rightarrow n = \frac{\times}{\times} =$ **65**

Therefore, total number of questions = 65. **Thus the required answer is option (b).**

Ans.68.(a) Complete years 2000. No. of odd–days in 2000 = 0.

Odd day in Jan = 3, Feb = 0, March = 3, April 6, Total = 12, and odd days = 5. Day = Sunday + 5 = **Friday**

Ans.69.(c) Let x denote the monthly income variable and y denote the monthly expenditure.

As per question,

$\frac{5}{9}x - \frac{9}{16}y = 500$ .....**(i)**

and $\frac{4}{9}x - \frac{7}{16}y = 500$ .....**(ii)**

Solving (i) and (ii) x = 900

$\Rightarrow$ Their monthly income are $-x$ and

$-x =$ **Rs. 5000 and Rs. 4000 respectively.**

Ans.70.(c) C = B + 20% of B

$= B + \frac{}{} = \frac{}{}$.

$B = A + 25\%\text{ of } A = A + \frac{}{} = \frac{}{}$

$\Rightarrow C = -B = -\times - A = -A$

$= A + \frac{}{} = A + 50\%\text{ of } A$

Ans.71.(b) Let my daily income be Rs. x.

Then, $7(1200 - x) = 9(x - 880)$ x = **1020**.

Ans.72.(a)

Saving of A = 2400, of B 1200.

Then, $5x - 8y = 2400$ and $3x - 5y = 1200$.

Solving, we get x = 2400.

Hence 5x = **12,000**.

Ans.73.(a) $? = 1.5 \times 1.2 - 0.06 \times 0.5$

$= 1.80 - 0.030 = 1.770 =$ **1.77**

Ans.74.(b)

$76.59 + 129.052 - 38.314 = ? + 45.72$

$\Rightarrow 205.642 - 38.314 - 45.72 = ?$

$\Rightarrow 167.328 - 45.72 = ? \Rightarrow ? =$ **121.608**

Ans.75.(d) $336 \div 12 \times 15 - ? = 138$

$\Rightarrow ? = 336/12 \times 15 - 138$

$= 28 \times 15 - 138 = 420 - 138 =$ **282**

Ans.76.(c) $? = 168 \times \frac{15}{24} \times 12 =$ **1260**

Ans.77.(c) $4410 \div 45 \div 7 = 98 \div 7 =$ **14**

Ans.78.(d) $7586 + 11254 - ? = 8976$

$\Rightarrow 18840 - 8976 = ?$

$\Rightarrow$ **? = 9864**

Ans.79.(d) $1111 + 12121 + 1020102 = ?$

$\Rightarrow 13232 + 1020102 = ?$

$\Rightarrow$ **? = 1033334**

Ans.80.(a) The contribution by the workers in the workshop = 196 – 16 = Rs. 180. Let the number of workers in A grade be x and in B grade be y.

$\therefore x^2 + y^2 = 180.$

Now, by putting x = 12 and y = 6,

we get $x^2 + y^2 = 180$

$\therefore x + y = 12 + 6 =$ **18**

Ans.81.(c) $\frac{\sqrt{196}}{14} \times \frac{17}{\sqrt{289}} \times \frac{78}{\sqrt{169}} = ?$

$\Rightarrow ? = \frac{\sqrt{14 \times 14}}{14} \times \frac{17}{\sqrt{17 \times 17}} \times \frac{78}{\sqrt{13 \times 13}}$

$\Rightarrow ? = \frac{14}{14} \times \frac{17}{17} \times \frac{78}{13} = \frac{18564}{3094} =$ **6**

Ans.82.(b) $\frac{?}{\sqrt{0.25}} = 250$

$\Rightarrow ? = 250 \times \sqrt{0.25}$

$\Rightarrow 250 \times \sqrt{0.5 \times 0.5} = 250 \times 0.5$

$\Rightarrow 250 \times \frac{5}{10} =$ **125**

Ans.83.(d) $\frac{189}{\sqrt{a}} = 1.89 \Rightarrow \frac{189}{1.89} = \sqrt{a}$

$\Rightarrow \frac{18900}{189} = \sqrt{a}$, Squaring both sides

$(100)^2 = (\sqrt{a})^2 \Rightarrow$ **10000 = a**

Ans.84.(a) $\sqrt{12} + \sqrt{24}$

$= \sqrt{2 \times 2 \times 3} + \sqrt{2 \times 2 \times 2 \times 3} =$ **$2\sqrt{3} + 2\sqrt{6}$**

Ans.85.(b) $\sqrt{100} + \sqrt{49}$

$\Rightarrow \sqrt{10 \times 10} + \sqrt{7 \times 7} = 10 + 7 =$ **17**

Ans.86.(b) $\sqrt{0.00004761}$

$= \sqrt{\frac{4761}{100000000}} = \sqrt{\frac{69\times69}{10000\times10000}}$

$= \frac{69}{10000} = \mathbf{0.0069}$

Ans.87.(b)

$$\frac{\sqrt{1+x}+\sqrt{1-x}}{\sqrt{1+x}-\sqrt{1-x}} \times \frac{\sqrt{1+x}+\sqrt{1-x}}{\sqrt{1+x}+\sqrt{1-x}}$$

$$= \frac{\left(\sqrt{1+x}+\sqrt{1-x}\right)^2}{\left(\sqrt{1+x}\right)^2-\left(\sqrt{1-x}\right)^2}$$

$$= \frac{1+x+1-x+2\sqrt{1-x^2}}{(1+x)-(1-x)} = \frac{1+\sqrt{1-x^2}}{x}$$

$$= \frac{1+\sqrt{1-3/4}}{\sqrt{3}/2} = \frac{1+1/2}{\sqrt{3}/2} = \sqrt{3}$$

Ans.88.(a) Let x and y be the shares of the two sons.

$\therefore x + y = 3,90,300$

$\Rightarrow y = (390300 - x)$

For the boy of age 13 years,

= 5 years, Rate = 4%, Principal = x

$\therefore$ Amount after 5 years compounded annually $= x\left(1+\frac{4}{100}\right)^5$ .....(i)

For the boy of age 15 years :

Time = 3 years, Principal = 390300 – x

$\therefore$ Amount after 3 years compounded annually

$= (390300-x)\left(1+\frac{4}{100}\right)^3$ .....(ii)

From **(i)** & **(ii)**, we get

$$x\left(1+\frac{4}{100}\right)^5 = (390300-x)\left(1+\frac{4}{100}\right)^3$$

$\frac{676}{625}x = (390300 - x)$

$\Rightarrow$ **x = 187500** and **y** = 390300 – 187500

$\Rightarrow$ **y = 202800**

Ans.89.(c) Profit of Rs. 3500 is divided among A, B and C in the ratio 26000 : 34000 : 10000.

i.e. in the ratio 13 : 17 : 5.

$\therefore$ B's share of profit $= \frac{17}{35}\times 3500$

= Rs. 1700.

Ans.90.(c) 15% of the income = Rs. 6750

$\therefore$ Total income = Rs. 45000

$\Rightarrow$ Amount given to the wife by Mr. Rai **= Rs. 22500**

Ans.91.(c) 5 $\otimes$ 7 = (5 $\times$ 7) + 7 **= 42**

Ans.92.(a) $\frac{24}{100}\times 250 + \frac{?}{100}\times 240 = 120$

$\Rightarrow 60 + \frac{?\times 12}{5} = 120$

$\Rightarrow ? = \frac{(120-60)\times 5}{12} = \mathbf{25}$

Ans.93.(e) $\frac{22}{100}\times ? + \frac{30}{100}\times 420 = 192$

$\Rightarrow \frac{22\times ?}{100} = 192 - 126 = 66$

$\Rightarrow$ **? = 300**

Ans.94.(b) ? % of 150 + 75 $\times$ 18 = 1380

$\Rightarrow \frac{?}{100} \times 150 + 1350 = 1380$

$\Rightarrow ? = \frac{3000}{150} \Rightarrow$ **? = 20**

Ans.95.(b) C.P. of 50 kg. of tea

= Rs. (20 × 30 + 30 × 25) = Rs. 1350.

S.P. of 50 kg. of tea = Rs. (50 × 22.50)

= Rs. 1125.

Loss = Rs. (1350 –1125) = **Rs. 225.**

Ans.96.(a) $\frac{2\times3\times2}{3+2} = \frac{2d}{5}$

$\left[\text{Average Speed} = \frac{2xy}{x+y}\right]$

$\therefore 10\ d = 60$ ***or*** **d = 6.**

Ans.97.(b) Let x gm of water be taken

Then, Gold = 19x gm & Copper = 9x gm.

Let 1 gm of gold be mixed with y gm of Copper.

Then, 19x + 9xy = 15x (1 + y)

$\Rightarrow$ **y =** $\left(\frac{2}{3}\right)$

Ans.98.(a) $(1502)^2 - (1498)^2$

= (1502 – 1498) (1502 + 1498)

= 4 × 3000 = **12000.**

Ans.99.(b) $\frac{3}{5}$ of 480 ÷ 8 + 8^2 = ?

$\therefore ? = \frac{3}{5}\times 480 \times \frac{1}{8} + 64$

= 36 + 64 = **100**

Ans.100.(a) 64 ÷ 8 ÷ 4 ÷ 2

= 8 ÷ 4 ÷ 2 = 2 ÷ 2 = **1**

Ans.101.(c) $\frac{a}{b} = \frac{2}{3}, \frac{b}{c} = \frac{5}{7}$

$\Rightarrow \frac{a}{10} = \frac{b}{15} = \frac{c}{21}$

Ans.102.(d) Let the two numbers be 5K and 7K.

$\therefore$ L C M of 5 K and 7 K = 35 K

$\Rightarrow$ 35 K = 315 $\Rightarrow$ K = 9

Hence the numbers are **45** and **63**.

Their product is **2835.**

Ans.103.(c) $\frac{X}{Y} = \frac{3}{4}, \frac{Y}{Z} = \frac{5}{6}, \frac{Z}{W} = \frac{2}{3}$

$\Rightarrow \frac{X}{15} = \frac{Y}{20} = \frac{Z}{24} = \frac{W}{36}$

$\Rightarrow$ X : W = 15 : 36 = **5 : 12**

Ans.104.(e) 28 – 5 + 5 – (–13) = **41**

Ans.105.(b) 7.007 + 70.7 + 7.007 = **84.714**

Ans.106.(d) Last three digits must be divided by **8.**

Ans.107.(d) Let x be the number

14% of x = 105 $\Rightarrow$ **x = 750.**

Ans.108.(b) In one minute,

$\frac{1}{10}+\frac{1}{20}+\frac{1}{30}-\frac{1}{15} = \frac{11}{60}-\frac{1}{15} = \frac{7}{60}$

of the tank can be filled.

$\therefore$ Whole tank will be filled in

$\frac{60}{7} = \mathbf{8\frac{4}{7}}$ minutes.

Ans.109.(c) × – = 192

$\Rightarrow$ **x = 24**

Ans.110.(d) Given expression

$= \frac{0.152}{0.25+0.09-0.15}$

$= \frac{0.152}{0.19} = \frac{152}{190} = \frac{8}{10} =$ **0.8**

Ans.111.(c) Given expression

$= \frac{\sqrt{0.01+0.08}}{0.003} = \frac{\sqrt{0.09}}{0.003} = \frac{0.3}{0.003} =$ **100**

Ans.112.(a)

$\frac{2}{3}$ of $\frac{1}{4}$ of 25.20 = K $\times \frac{3}{2}$ of 36

$\Rightarrow$ 4.2 = 54 K

$\Rightarrow$ K = $\frac{42}{540} = \mathbf{\frac{7}{90}}$

Ans.113.(c) $1+2\left[3-\left\{1+\left(2-\frac{1}{2}-\frac{5}{2}\right)\right\}\right]$

= 1 + 2 [3 – {1 + (2 + 2)}]

= 1 + 2 [3 – 5] = 1 + 2 (–2)

= 1 – 4 = **–3**

Ans.114.(a) 0.2, $(.2)^2$ = 0.04,

$0.\bar{2} = 0.222$, $1 \div 0.2 = \frac{1}{0.2} = 5$

Ans.115.(a) 5% of (5% of 100)

= 5% of 5 = $\frac{1}{4}$ = **0.25**

Ans.116.(d) Let x = $\sqrt{6+\sqrt{6+\sqrt{6+.....}}}$

$\Rightarrow$ x = $\sqrt{6+x}$ $\Rightarrow x^2 = 6 + x$

$\Rightarrow x^2 - x - 6 = 0$

$\Rightarrow$ (x – 3)(x + 2) = 0

$\Rightarrow$ **x = 3**

Ans.117.(d) In one hour, $\frac{1}{10} - \frac{1}{15} = \frac{1}{30}$ of the cistern will be empty.

Ans.118.(b) Tap A and Tap B can fill together $\frac{1}{12} + \frac{1}{15} = \frac{2}{30}$ of the bucket in one minute.

In three minutes, $\frac{9}{20}$ of the bucket is filled by taps A and B.

$\therefore$ Remaining $\frac{11}{20}$ of the bucket is filled by tap B in $15 \times \frac{11}{20}$ = **8 minutes 15 seconds.**

Ans.119.(a) A, B and C's shares in the capital are in the ratio of 12000 $\times$ 24 : 16000 $\times$ 24 : 15000 $\times$ 16 ,

i.e. 288 : 384 : 240,

i.e. 18 : 24 : 15,

i.e. 6 : 8 : 5

$\therefore$ Share of C in the profit

= $\frac{5}{19} \times 45600$ = **Rs. 12000**

Ans.120.(a) Given expression

$$= \sqrt{\frac{(12.12+8.12)(12.12-8.12)}{(0.25)(0.25+19.99)}} + \frac{\left[8^{-15/8}\right]^{8/15} \times \left(16^3\right)^{1/4}}{\sqrt[3]{\left[(128)^{-15/7}\right]^{-1/5}}}$$

$$= \sqrt{\frac{4}{0.25}} + \frac{8^{-1} \times 8}{\sqrt[3]{(128)^{\frac{3}{7}}}} = 4 + \frac{1}{\left(2^7\right)^{\frac{1}{7}}} = \mathbf{4\frac{1}{2}}$$

Ans.121.(b) $\left(28+10\sqrt{3}\right)^{\frac{1}{2}} - \left(7-4\sqrt{3}\right)^{-\frac{1}{2}}$

$$= \left\{\left(5+\sqrt{3}\right)^2\right\}^{\frac{1}{2}} - \left\{\left(2-\sqrt{3}\right)^2\right\}^{\frac{-1}{2}}$$

$$= \left(5+\sqrt{3}\right) - \left(2-\sqrt{3}\right)^{-1}$$

$$= \left(5+\sqrt{3}\right) - \frac{1}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}}$$

$$= \left(5+\sqrt{3}\right) - \left(2+\sqrt{3}\right) = \mathbf{3}$$