

Solved Paper

13. $\sqrt[3]{(13.608)^2 \times (13.392)^2}$ is equal to
 (a) 0.6 (b) 0.06
 (c) 1.8 (d) 2.6
14. $\frac{1}{\sqrt{1}}, \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{4}}, \dots, \frac{1}{\sqrt{99}}, \frac{1}{\sqrt{100}}$ is equal to:
 (a) $\frac{1}{9900}$ (b) $\frac{99}{100}$ (c) $\frac{100}{99}$ (d) $\frac{100}{9}$
15. The sum of all the digits of the numbers from 1 to 100 is
 (a) 5050 (b) 903
 (c) 901 (d) 900
16. As a shopkeeper sells sugar in such a way that the selling price of 90 kg of sugar is the same as the cost price of 1 kg of sugar. What is his gain per cent?
 (a) $5\frac{5}{19}$ (b) $5\frac{1}{5}$ (c) 5 (d) $4\frac{1}{19}$
17. A person bought a horse and a carriage for Rs. 2000. Later, he sold the horse at a 20% profit and the carriage at a 10% loss. Thus, he gained 5% in the whole transaction. The cost price of the horse was
 (a) Rs. 7200 (b) Rs. 7500
 (c) Rs. 8000 (d) Rs. 9000
18. As a merchant sells to B at a 15% profit. B sells it to C at 10% loss. If C pays Rs. 510 for it, then A purchased it at
 (a) Rs. 500 (b) Rs. 750
 (c) Rs. 1000 (d) Rs. 1200
19. An article is sold at a certain fixed price. By selling it at $\frac{2}{3}$ of that price, one loses 10%. The gain per cent on selling it at the original price is
 (a) 20 (b) $33\frac{1}{3}$
 (c) $\frac{200}{9}$ (d) 0
20. A sells an article to B for Rs. 400, gaining 10% in the transaction. B sells it to C at a price which would have given a profit of 10% to A. What per cent does B gain?
 (a) $\frac{75}{2}$ (b) $\frac{100}{3}$ (c) $\frac{20}{9}$ (d) $\frac{50}{7}$
21. The cost price of an article is 8% of its marked price for sale. How much per cent does the trader gain after allowing a discount of 12%?
 (a) 20 (b) 2
 (c) 10 (d) 8
22. A merchant has announced a 25% rebate on the price of a radio. In order to have a net profit of Rs. 400, then how many radios, each costing Rs. 320, should he purchase?
 (a) 10 (b) 7
 (c) 6 (d) 5
23. A merchant purchases a wristwatch for Rs. 450 and fixes its list price in such a way that after allowing a discount of 10%, he earns a profit of 20%. Then the list price (in rupees) of the wristwatch is
 (a) 500 (b) 600
 (c) 750 (d) 800
24. A reduction of 1% in the price of tea enables a dealer to purchase 25 kg more tea for Rs. 2250. What is the reduced price per kg of tea?
 (a) Rs. 70 (b) Rs. 80
 (c) Rs. 90 (d) Rs. 10
25. A man deposited 40% of his income in a bank and deposited 10% of the rest in another bank. He now has Rs. 8640 left with him, then his income is
 (a) Rs. 12,500 (b) Rs. 12,000
 (c) Rs. 10,500 (d) Rs. 10,000
26. If the length of a rectangle is increased by 10% and its breadth is decreased by 10%, then its area
 (a) decreases by 1% (b) increases by 1%
 (c) decreases by 2% (d) remains the same

27. Three spherical balls of radius 1 cm, 2 cm and 3 cm are melted to form a single spherical ball. In the process, the loss of material is 25%. The radius of the new ball is
 (a) 6 cm (b) 5 cm
 (c) 3 cm (d) 2 cm
28. If $A : B = 2 : 3$, $B : C = 4 : 5$ and $C : D = 5 : 9$, then $A : D$ is equal to
 (a) 11 : 17 (b) 8 : 27
 (c) 5 : 9 (d) 2 : 9
29. If the length of a rectangle is increased in the ratio 6 : 7 and its breadth is diminished in the ratio 5 : 4 then its area will be diminished in the ratio
 (a) 17 : 16 (b) 15 : 14
 (c) 9 : 8 (d) 8 : 7
30. 7 years ago, the ages (in years) of A and B were in the ratio 4 : 5; and 7 years hence they will be in the ratio 5 : 6. The present age of B is
 (a) 56 years (b) 63 years
 (c) 70 years (d) 77 years
31. Two numbers are such that their difference, their sum and their product are in the ratio of 1 : 7 : 24. The product of the numbers is
 (a) 24 (b) 36
 (c) 48 (d) 60
32. A, B, C are partners in a business. During a particular year, A received one third of the profit, B received one fourth of the profit and C received the remaining Rs. 5000. How much amount of money did A receive?
 (a) Rs. 1000 (b) Rs. 3000
 (c) Rs. 4000 (d) Rs. 5000
33. Three horses are tethered at 3 corners of a triangular plot of land having sides 20m, 30m and 40m each with a rope of length 7m. The area (in m^2) of the region of this plot, which can be grazed by the horses, is
 (Use $\frac{22}{7}$)
- (a) $\frac{77}{3}$ (b) 75 (c) 77 (d) 80
34. A wire when bent in the form of a square, loses a region of area 21 cm^2 . If the same wire is bent into the form of a circle, then the area of the circle is (Use $\frac{22}{7}$)
 (a) 150 cm^2 (b) 152 cm^2
 (c) 154 cm^2 (d) 159 cm^2
35. The ratio of the radius of a circle to the area of the circle is 1 : 4. If the area of the circle is 154 cm^2 , the perimeter of the sector is
 (a) 20 cm (b) 25 cm
 (c) 36 cm (d) 40 cm
36. The length of the diagonal of a cube is 6 m. The volume of the cube (in cm^3) is
 (a) $18\sqrt{3}$ (b) $24\sqrt{3}$
 (c) $8\sqrt{3}$ (d) $3\sqrt{3}$
37. If a perimeter of radius r is divided into four equal parts then the total surface area of the four parts is
 (a) $4r^2$ square unit (b) $2/r^2$ square unit
 (c) $8/r$ square unit (d) $1/r^2$ square unit
38. A sum of money deposited at a certain rate percent per annum compounds interest and doubles itself in 10 years. How many years will it become 16 times of itself at the same rate?
 (a) 16 (b) 1
 (c) 40 (d) 8
39. What is the difference between the compound interest and simple interest on Rs. 1000 at 5% per annum for 2 years?
 (a) 10 (b) 11
 (c) 2 (d) 100
40. The simple and compound interests on a sum of money for 2 years are Rs. 8400 and Rs. 8620 respectively. The rate of interest per annum is
 (a) 6

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41. A man can row against the current three-fourth of a kilometre in 15 minutes and returns the same distance in 10 minutes. The ratio of his speed to that of the current is
 (a) 3 : 5 (b) 5 : 3
 (c) 1 : 5 (d) 5 : 1
42. Two places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at a constant speed, they meet in 5 hours. If the cars travel towards each other, they meet in 1 hour. What is the speed of the car running faster ?
 (a) 60 km/hr. (b) 50 km/hr.
 (c) 40 km/hr. (d) 32 km/hr.
43. A can complete a piece of work in 12 days. B is 60% more efficient than A. The number of days, that B will take to complete the same work, is
 (a) 6 (b) $7\frac{1}{2}$ (c) 8 (d) $8\frac{1}{2}$
44. Two pipes can fill an empty tank separately in 24 minutes and 40 minutes respectively and a third pipe can empty 30 gallons of water per minute. If all the three pipes are open, empty tank becomes full in one hour. The capacity of the tank (in gallons) is
 (a) 800 (b) 600
 (c) 500 (d) 400
45. A batsman, in his 12th innings, makes a score of 63 runs and thereby increases his average score by 2. The average of his score after 12th innings is
 (a) 41 (b) 42
 (c) 34 (d) 35
46. The greatest number, that divides 43, 91 and 183 so as to leave the same remainder in each case, is
 (a) 9 (b) 8
 (c) 4 (d) 3
47. $\frac{\sqrt{7}}{\sqrt{16 \vee 6\sqrt{7}} \% \sqrt{16 - 6\sqrt{7}}}$ is equal to
 (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$
48. The sum of the areas of the 10 squares, the lengths of whose sides are 20 m, 21 m, ... 29 cm respectively is
 (a) 685 cm² (b) 855 cm²
 (c) 270 cm² (d) 1125 cm²
49. The square root of $\frac{9.5, 0.0085, 18.9}{0.0017, 1.9, 2.1}$ is
 (a) 15 (b) 45
 (c) 75 (d) 25
50. If $2x \vee \frac{1}{x} = 6$, then $3x - \frac{1}{2x}$ is equal to
 (a) 4 (b) 8
 (c) 9 (d) 2
51. If $x = \lfloor \sqrt{2} \rfloor^{\frac{1}{2}}$ then the value of $\frac{x^2 - \frac{1}{x^2}}{x^2 + \frac{1}{x^2}}$ is
 (a) 2 (b) $2\sqrt{2}$
 (c) $2\sqrt{2}$ (d) $2\sqrt{2}$
52. $\frac{3}{4} \vee \frac{1}{3} \vee \frac{2}{5} \vee \frac{2}{5} \vee \frac{6}{7} \vee \frac{2}{13}$ is equal to
 (a) $\frac{2}{13}$ (b) $\frac{1}{7}$ (c) $\frac{1}{13}$ (d) $\frac{1}{5}$
53. $\frac{(0.87)^3 \vee (0.13)^3}{(0.87)^2 \vee (0.13)^2 \vee 0.7 \vee (0.1)}$ is equal to
 (a) $\frac{1}{2}$ (b) 2 (c) 2 (d) $2\frac{1}{2}$
54. If $x^2 + y^2 - 2x$

55. The largest among the numbers

$$\sqrt{7}, \sqrt{5}, \sqrt{5}\sqrt{3}, \sqrt{9}\sqrt{7}, \sqrt{11}\sqrt{9}$$

- (a) $\sqrt{7}\sqrt{5}$ (b) $\sqrt{5}\sqrt{3}$
(c) $\sqrt{9}\sqrt{7}$ (d) $\sqrt{1}\sqrt{9}$

56. If $x^{1/2} y^{1/3} = z^{1/3}$, then $(x+y-z)^3 + 7xyz$ is equal to

- (a) 0 (b) 1
(c) -1 (d) 27

57. If $\sqrt{7}\sqrt{\sqrt{7}\sqrt{\sqrt{7}\sqrt{\sqrt{7}\dots}}}$ $(343)^{y-1}$

then y is equal to

- (a) $\frac{2}{3}$ (b) 1
(c) $\frac{4}{3}$ (d) $\frac{3}{4}$

8. If $a^2 = 2$, then $(a+1)$ is equal to

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

59. The middle term in the expansion $(2+3x)^{19}$ is

- (a) 16 (b) 15
(c) 4 (d) 1

60. The wrong number in the sequence

- (a) 32 (b) 47
(c) 6 (d) 3

61. When the price of a toy was increased by 20%, the number of toys sold was decreased by 5%. What was the effect on the total sales of the shop?

- (a) 2% increase (b) 2% decrease
(c) 4% increase (d) 4% decrease

62. A person sold a house at a gain of 15%. Had he bought it for 25% less and sold it for Rs. 601 less, he would have had a profit of 32%. The cost price of the house was

- (a) Rs. 370 (b) Rs. 372
(c) Rs. 375 (d) Rs. 78

3. A salesman reported a gain of 5% based on the cost. He sold the article at a price of Rs. 20 and then sold it at a price of 10% more. He paid Rs. 330 for it. How much did it cost to A?

- (a) Rs. 200 (b) Rs. 250
(c) Rs. 275 (d) Rs. 290

4. A man sold an article for Rs. 21, a man told him that the percentage loss was equal to the cost price. The cost price of the article was

- (a) Rs. 30 or Rs. 7 (b) Rs. 35 or Rs. 60
(c) Rs. 45 (d) Rs. 50

63. Half of 100 articles were sold at a profit of 20% and the other half at a profit of 40%. If all the articles had been sold at a profit of 5%, the total profit would have been Rs. 100 less than the actual profit. The cost price of each article was

- (a) Rs. 10 (b) Rs. 15
(c) Rs. 20 (d) Rs. 30

64. The marked price of a clock is Rs. 20. It is sold for Rs. 2448 at two successive discounts. If the first discount is 10%, then the second discount is

- (a) 5% (b) 10%
(c) 5% (d) 2%

67. A dealer marks his goods 10% above the cost price and then allows 15% discount on it. What is the net percentage gain or loss which he gains or loses?

- (a) Rs. 800 (b) Rs. 560
(c) Rs. 373.33 (d) Rs. 280

68. A shopkeeper wishes to give 5% commission on the marked price of an article but also wants to earn a profit of 10%. If his cost price is Rs. 95, then the marked price is

- (a) Rs. 100 (b) Rs. 110
(c) Rs. 120 (d) Rs. 130

69. A person's monthly salary is Rs. 15000 per month and he saves 8% of it. Due to pay revision, his monthly income was increased by 2%, but due to the increase in price, he has to spend 20% more. His new savings are

- (a) Rs. 3400 (b) Rs. 3000 (c) Rs. 46

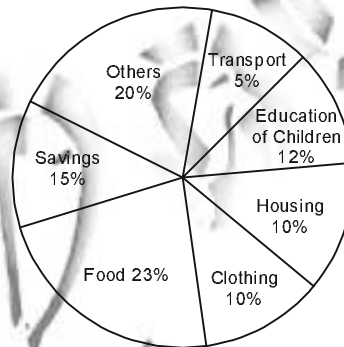
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70. Two numbers are respectively $12\frac{1}{2}\%$ and 25% more than a third number. The first number is how much per cent of the second number?
 (a) 90 (b) 87.5
 (c) 25 (d) 12.5
71. Population of a town increases 2.5% annually but is decreased by 0.5% every year due to migration. What will be the percentage of increase in 2 years?
 (a) 5 (b) 4.04
 (c) 4 (d) 3.96
72. 72% of the students of a certain class took Biology and 44% took Mathematics. If each student took at least one of Biology or Mathematics and 40 students took both of these subjects, the total number of students in the class is
 (a) 200 (b) 240
 (c) 250 (d) 320
73. Rs. 1050 are divided among A, B and C in such a way that the share of A is $\frac{2}{5}$ of the combined share of B and C. A will get
 (a) Rs. 200 (b) Rs. 300
 (c) Rs. 320 (d) Rs. 420
74. The sides of a right-angled triangle forming right angle are in the ratio 5 : 12. If the area of the triangle is 270 cm^2 , then the length of the hypotenuse is
 (a) 39 cm (b) 42 cm
 (c) 45 cm (d) 51 cm
75. Two numbers are in the ratio 5 : 6. If their H.C.F is 4, then their L.C.M. will be
 (a) 90 (b) 96
 (c) 120 (d) 150
76. If $a + b + c = 1$ and $ab + bc + ca = \frac{1}{3}$ then $a : b : c$ is
 (a) 1 : 2 : 2 (b) 2 : 1 : 2
 (c) 1 : 1 : 1 (d) 1 : 2 : 1
77. A and B enter into partnership with capitals in the ratio 5 : 6. At the end of 8 months A withdraws his capital. They received profits in the ratio 5 : 9. B invested the capital for
 (a) 6 months (b) 8 months
 (c) 10 months (d) 12 months
78. What is the length of the radius of the circum-circle of the equilateral triangle, the length of whose side is $6\sqrt{3} \text{ cm}$?
 (a) $6\sqrt{3} \text{ cm}$ (b) 6 cm
 (c) 5.4 cm (d) $3\sqrt{6} \text{ cm}$
79. If the measure of a diagonal and the area of a rectangle are 25 cm and 168 cm^2 respectively, what is the length of the rectangle?
 (a) 31 cm (b) 24 cm
 (c) 17 cm (d) 7 cm
80. The number of coins, each of radius 0.75 cm and thickness 0.2 cm, to be melted to make a right circular cylinder of height 8 cm and radius 3 cm, is
 (a) 640 (b) 600 (c) 500 (d) 480
81. If the radius of a sphere is increased by 2m, its surface-area is increased by 704 m^2 . What is the radius of the original sphere?
 Use $4\pi r^2$
 (a) 1 m (b) 1 m (c) 1 m (d) 3 m
82. A right circular cylinder is circumscribing a hemisphere such that the bases are common. The ratio of their volumes is
 (a) 1 : 3 (b) 1 : 2
 (c) 2 : 3 (d) 3 : 4
83. A man invested $\frac{1}{3}$ of his capital at $7\frac{1}{4}\%$ 8% and the remainder at 10% rate of simple interest. If his annual income from interest is Rs. 61, the capital invested was
 (a) Rs. 600 (b) Rs. 560
 (c) Rs. 660 (d) Rs. 600

84. The compound interest on Rs. 6250 at 12% per annum for 1 year, compounded half-yearly is
 (a) Rs. 772.50 (b) Rs. 772
 (c) Rs. 672.50 (d) Rs. 672
85. A sum of money lent at compound interest amounts to Rs. 1460 in 2 years and to Rs. 1606 in 3 years. The rate of interest per annum is
 (a) 12% (b) 11%
 (c) 10.5% (d) 10%
86. If A travels to his school from his house at the speed of 3 km/hr. then he reaches the school 5 minutes late. If he travels at the speed of 4 km/hr, he reaches the school 5 minutes earlier than school time. The distance of his school from his house is
 (a) 1 km (b) 2 km
 (c) 3 km (d) 4 km
87. A train travelling with a speed of 60 km/hr catches another train travelling in the same direction and then leaves it 120 m behind in 18 seconds. The speed of the second train is
 (a) 26 km/hr (b) 35 km/hr
 (c) 36 km/hr (d) 63 km/hr
88. A and B together can complete a piece of work in 12 days and B and C together in 15 days. If A is twice as good a workman as C, then in how many days will be alone complete the same work?
 (a) 30 (b) 25
 (c) 24 (d) 20
89. 4 men and 6 women together can complete a work in 8 days while 3 men and 7 women together can complete it in 10 days. 20 women working together will complete it in
 (a) 36 days (b) 32 days
 (c) 24 days (d) 20 days
90. The average of two numbers A and B is 20, that of B and C is 19 and of C and A it is 21. What is the value of A?
 (a) 24 (b) 22
 (c) 20 (d) 18

Directions (91-95): The pie chart given below, shows the expenditure on various items and savings of a family during the year 2009. Study the pie chart and answer these questions.

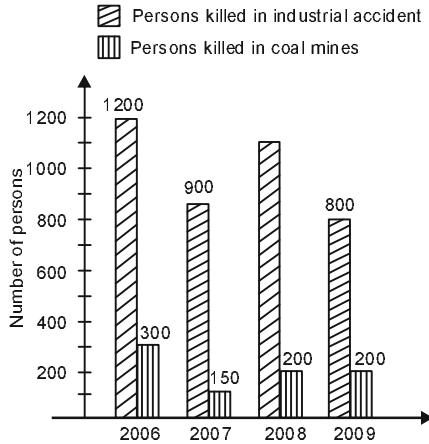
PERCENTAGE OF MONEY SPENT ON VARIOUS ITEMS AND SAVINGS BY A FAMILY DURING 2009



91. If the total income of the family for the year 2009 was Rs. 1,50,000 then the difference between the expenditures on housing and transport was
 (a) Rs. 15,000 (b) Rs. 10,000
 (c) Rs. 12,000 (d) Rs. 7,500
92. Maximum expenditure of the family other than on food, was on
 (a) Housing (b) Clothing
 (c) Others (d) Education of children
93. The savings of the family for the year were equal to the expenditure on
 (a) Food (b) Housing
 (c) Education of children (d) Clothing
94. The percentage of the income which was spent on clothing, education of children and transport together is
 (a) 17 (b) 20
 (c) 22 (d) 27
95. If the total income of the family was Rs. 1,50,000 then the money spent on food was
 (a) Rs. 20,000 (b) Rs. 23,000
 (c) Rs. 30,000 (d) Rs. 34,500

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Directions (96-100): Study the bar diagram and answer these questions.



96. The number of persons killed in coal mines in 2006 was what per cent of those killed in industrial accidents in that year ?
 (a) 4 (b) 25
 (c) 36 (d) 300
97. In which year, minimum number of persons were killed in industrial accidents and coal mines together?
 (a) 2006 (b) 2007
 (c) 2008 (d) 2009
98. In which year, maximum number of persons were killed in industrial accidents other than those killed in coal mines?
 (a) 2006 (b) 2007
 (c) 2008 (d) 2009
99. In which years, minimum number of persons were killed in coal mines other than those killed in industrial accidents?
 (a) 2006 (b) 2007
 (c) 2008 (d) 2009
100. In a year, on average, how many persons were killed in industrial accidents and coal mines together ?
 (a) 121.25 (b) 1212
 (c) 1212.5 (d) 1000

ANSWERS

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

EXPLANATIONS

1. Number of men arranged in the form of a square
 $= 6000 - 71 = 5929$
 3 Number of men arranged in each row
 $\sqrt{5929} = 77$
2. Remainder
 2
 4
 10
 1 53
 5 214
4. $\frac{(0.75)^3}{1 - 0.7}$ $[(0.75)^2 \quad 0.75 \quad 1 \quad 1]$

$$= \frac{(0.75)^3 \sqrt{(1 - 0.75)[(0.75)^2 \sqrt{0.75}, 1 \sqrt{1^2}]}}{1 \times 0.75}$$

$$= \frac{(0.75)^3 \sqrt{1^3 \times (0.75)^3}}{0.2}$$

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

$$= \frac{1}{1 \times 0.75} = \frac{1}{0.5} = \frac{100}{25} = 4$$

$$3 \text{ 4 q ar roo } \sqrt{4} = 2$$

$$5. \quad \begin{aligned} x + y &= 12 && \dots(i) \\ xy &= 35 && \dots(ii) \end{aligned}$$

$$3 \quad \frac{x \sqrt{y}}{xy} = \frac{1}{y} \sqrt{\frac{1}{x}} = \frac{12}{3}$$

$$6. \quad a^2 - b^2 \sqrt{\frac{1}{a^2} - \frac{1}{b^2}} = 4$$

$$5 \quad 4^2 \sqrt{\frac{1}{2} - \frac{1}{b^2}} = 4$$

$$5 \quad a \sqrt{\frac{1}{a^2} - \frac{1}{b^2}} \sqrt{2} = 4$$

$$\left(\frac{1}{a} \sqrt{\frac{1}{a^2} - \frac{1}{b^2}}\right) \sqrt{2} = 0$$

$$5 \quad a \sqrt{\frac{1}{a^2} - \frac{1}{b^2}} = 0, \quad b \sqrt{\frac{1}{b^2} - \frac{1}{a^2}} =$$

$$5 \quad a = b = +1$$

$$3 \quad a^2 + b^2 = 1 + 1 = 2.$$

$$7 \quad \left(x \sqrt{\frac{1}{x}}\right)^2 = 3$$

$$4x \sqrt{\frac{1}{x}} = \sqrt{3}$$

$$\text{No, } x^3 \sqrt{\frac{1}{x}}$$

$$= \left(\frac{1}{x} \sqrt{\frac{1}{x}}\right)^3 \times \frac{1}{x} \sqrt{\frac{1}{x}}$$

$$= \sqrt[3]{\frac{1}{x^3}} \times \sqrt{\frac{1}{x}}$$

$$= 3\sqrt[3]{\frac{1}{x^3}} \times \sqrt{\frac{1}{x}} = 0$$

8. If $0.1 = 1$ then, $0. = 2a$
and $0.0 = \text{he}$, $0.04 = 2b$
3 E pr si n

$$\frac{a \sqrt{b}}{a, 2} = \frac{a \sqrt{2b}}{a \sqrt{2b}, b, 2}$$

$$\frac{a^3 \sqrt{b}}{8a^3 \sqrt{b}} = \frac{a^3 \sqrt{2b^3}}{(a^3 \sqrt{2b^3})} = \frac{1}{8} = 0.125$$

$$10 \quad x^3 + 3x^2 + 3x + 7$$

$$5 \quad x^3 - 3x^2 + 3x + 1 = 7 + 1 = 8$$

$$5 \quad (x+1)^3 - 2^3$$

$$x + 2$$

$$5 \quad x - 1$$

$$1. \quad x \sqrt{\frac{2}{x}}$$

$$5 \quad x \sqrt{\frac{1}{x}} = \frac{1}{2} \dots(i)$$

$$3 \quad x^3 \sqrt{\frac{1}{x^3}}$$

$$= \frac{1}{3} \quad \dots$$

$$\dots$$

$$\dots$$

s of the surds = LCM of 2, 3,

$$5 \text{ and } 7 = 210$$

$$\frac{1}{5^2} = \frac{105}{5^{210}} = \sqrt[210]{5^{105}}$$

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$$4^{\frac{1}{3}} = 4^{\frac{70}{210}} = 14^{70} \sqrt[210]{1}$$

$$2^{\frac{1}{5}} = 2^{\frac{42}{210}} = 12^{42} \sqrt[210]{1}$$

$$3^{\frac{1}{7}} = 3^{\frac{30}{210}} = 13^{30} \sqrt[210]{1}$$

3 The largest number

$$= 5^{\frac{1}{2}} = \sqrt{5}$$

13. Expression

$$= \sqrt[3]{(13.608)^2 \times (3.392)^2}$$

$$= \sqrt[3]{(13.608 \times 13.392)(13.608 \times 13.392)}$$

$$\sqrt[3]{27 \times 0.216}$$

$$= \sqrt[3]{\frac{27 \times 216}{1000}}$$

$$= \frac{3 \times 6}{10} = 1.8$$

16. Profit per cent

$$= \frac{\text{True weight} - \text{False weight}}{\text{False weight}} \times 100$$

$$= \frac{1000 - 950}{950} \times 100$$

$$= \frac{100}{19} = \frac{5}{19}$$

17. If the Profit is Rs. x , then

CP of car is = Rs. $(20000 - x)$

$$3 \times x, \frac{12}{10} (20000 - x), \frac{90}{100}$$

$$= 5000, \frac{102}{10}$$

$$5120 + 8000 - 0$$

$$= 204000$$

$$30x = 24000 - 180000$$

$$240000$$

$$3 = \frac{240000}{3} = 80000$$

1. If an article is sold to B at $x\%$ profit/loss and sells the same to C at $y\%$ profit/loss, then C's CP

$$= \text{CP} \left(\frac{100 + x}{100} \right) \left(\frac{100 + y}{100} \right)$$

$$3 \text{ A's CP} = \text{C's CP}$$

$$\left(\frac{100 + x}{100} \right) \left(\frac{100 + y}{100} \right)$$

$$= 17.5, \frac{10}{115}, \frac{100}{9} \text{ Rs } 500$$

19. If the CP of an article be Rs. 100.

$$3 \text{ S.P. of the article} \times \frac{2}{3} = 90$$

$$3 \text{ S.P. of the article}$$

$$= \frac{90 \times 3}{2} = 135$$

$$3 \text{ Profit on the original price} = 5$$

20. A's CP.

$$= 4500, \frac{10}{90} = \text{Rs. } 50000$$

$$3 \text{ B's S.P.}$$

$$= 500 \frac{110}{100}$$

$$= \text{Rs. } 550$$

$$3 \text{ 's profit}$$

$$= \frac{100, 100}{80} \text{ Rs } 125$$

5 After the discount

$$\text{Rs. } \left(\frac{125 \times 88}{100} \right) = \text{Rs. } 110$$

3 Gain percent = 10

3. If the marked price of the wrist watch be Rs. x , then

$$x \times \frac{90}{100} = \frac{50, 100}{100} = 50$$

$$5 x = \frac{50, 100}{90} = \text{Rs. } 555.56$$

24. Let the original price of tea be Rs. x / kg

$$\text{New price Rs. } \left(\frac{9x}{10} \right) / \text{kg}$$

$$3 \times \frac{22500}{9x} - \frac{22500}{x} = 25$$

$$5 \times 22500 \left(\frac{10}{9x} - \frac{1}{x} \right) = 25$$

$$5 \times 2500 \left(\frac{10}{9x} - \frac{1}{x} \right) = 25$$

$$5 \times 22500 \times 25 \times 9$$

$$5 x = \frac{250}{25, 9} = 100$$

New price

$$= \frac{90}{100} \times 100 = \text{Rs. } 90 \text{ per kg}$$

25. Let a's income = Rs. 100.

Donation to charity = Rs. 4

Amount deposited in bank

$$= \frac{6, 10}{100} = \text{Rs. } 96$$

$$\text{Average } 100 - 13.6 = \text{Rs. } 86.4$$

$$\text{Q Rs. } 86.4 = 100$$

$$\text{Rs. } 86.4 = \frac{100}{86} \times 8640$$

$$= \text{Rs. } 1000$$

26. Effect on area

$$= \left(10\% \times 10\% \right) \times \frac{10, 10}{100} \times \frac{1}{4}$$

$$= 1\%$$

Here, negative sign shows decrease.

7. Volume of new ball

$$= \frac{3}{4} \times \frac{3}{3} \left(r^3 \sqrt[3]{2^3} \sqrt[3]{r_3^3} \right)$$

$$= \frac{1}{4} (1^3 + 2^3 + 3^3)$$

$$= \frac{1}{4} (1 + 8 + 27)$$

$$= 6 \text{ cubic cm.}$$

$$\frac{4}{3} r^3 = 36$$

$$5 r = \frac{6 \times 3}{4} = 4.5$$

$$3 r = \sqrt[3]{27} = 3 \text{ cm}$$

30. 7 years ago, A's age was x years and B's age was $5x$ years

$$\frac{4x \sqrt[4]{4}}{1} = 6$$

$$5 \times 2x + 70 = 24x + 84$$

$$5x = 84 - 70 = 14$$

3 B's present age

$$= 5 \times 14 + 7 = 77 \text{ years}$$

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total profit

Solved Paper

$$= \frac{5000, 12}{5} \text{ Rs } 1200$$

3. As she = R. $\frac{1}{*}, 12000^3$

= Rs. 400

3. Side of the square

$$\sqrt{11} = 11 \text{ m}$$

3. Length of wire = $\times 11$

4 m

3. $2/r = 4$

$$\frac{2}{7}, r = 4$$

5 = 7c

3. Area of circle = πr^2

$$= \frac{22}{7} \times 7 \times 7$$

= 54 sq. cm

3. If the edge of the cube is x, then,

$$\sqrt{3}x = 6$$

$$x = \frac{6}{\sqrt{3}} = 2\sqrt{3} \text{ cm}$$

3. Volume of the cube = (edge)³

$$= 2\sqrt{3} \times 2\sqrt{3} \times 2\sqrt{3}$$

$$= 24\sqrt{3} \text{ cm}^3$$

3. Required total surface area

$$= 4/r^2 + 4 \times \pi/r^2$$

$$= 8/r^2 \text{ sq. unit}$$

39. Difference

$$= \text{Principal} \left[\left(\frac{R}{100} \right)^2 - \left(\frac{5}{100} \right)^2 \right] = 400 \left[\left(\frac{5}{100} \right)^2 - \left(\frac{5}{100} \right)^2 \right] = \text{Rs. } 1$$

40. Difference = Rs. (8652 - 8400) = Rs. 252

$$\text{Rate} = \frac{2 \times \text{Difference}}{\text{S.I.}}, 00$$

$$= \frac{2 \times 52}{400} \times 100 = 6$$

4. Ratio of their efficiencies

= 10 : 60 = 1 : 6

3. Ratio of time taken = 8 : 5

Time taken by

$$= 12, \frac{5}{8} = \frac{5}{2} = \frac{1}{2} \text{ days}$$

4. Capacity of the tank = 30 gallons

3. Part of the tank filled in 1 minute

$$= \frac{x}{4} \vee \frac{x}{40} \times 30$$

$$3 \left[\frac{x}{24} \vee \frac{x}{4} \times \frac{3}{4} \right] = x$$

$$3 \left[\frac{x}{24} - \frac{x}{40} \times \frac{3}{6} \right] = 30$$

$$5 \left[\frac{x \vee 3x}{12} - \frac{2x}{6} \right] = 30$$

$$5 \left[\frac{x}{20} - 3x \right] = 60 \text{ gallons}$$

45. Average of the numbers = $\frac{3 + 12 \times 2}{3} = 39$

$$= 3 - 12 \times 2 = 39$$

3. Average = $\frac{3 + 12}{2} = 41$

4. Required number

= H.F. of (91 - 43), (183 - 91) and (183 - 43)

= HCF of

$$\frac{\sqrt{91-43}}{\sqrt{183-91}} \vee \frac{\sqrt{183-43}}{\sqrt{91-43}}$$

$$\frac{\sqrt{48}}{\sqrt{92}} \vee \frac{\sqrt{140}}{\sqrt{48}}$$

$$\frac{\sqrt{48}}{\sqrt{92} \times \sqrt{48}}$$

$$= \frac{\sqrt{7}}{3\sqrt{7} \times 3\sqrt{7}} = \frac{1}{2}$$

48. Required $u = 0 + 1 + \dots + 2^2$
 $= 1 + 2 + \dots + 2^2 - 1 + 2 + \dots + 19$
 $= \frac{29(29+1)(2, 29+1)}{6} - \frac{19(19+1)(2, 19+1)}{6}$

$$= \frac{29 \cdot 30 \cdot 30 - 19 \cdot 20 \cdot 20}{6} = \frac{2610 - 760}{6} = \frac{1850}{6}$$

$$= 8555 - 2470 = 608 \text{ sq.cm.}$$

49. Expression

$$= \frac{9.5, 0.008, 18.9}{0.007, 1.9, 2}$$

$$= 225$$

3 Required square root

$$\sqrt{25} = 5$$

5. $x = \sqrt[3]{2} \cdot 12^{\frac{1}{2}}$

$$5 \cdot x^{-2} = \sqrt{2} \cdot 1$$

$$3 \cdot x^2 = \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$= \sqrt{2} \cdot \sqrt{2} = 2$$

$$3 \cdot \frac{1}{x^2} = \sqrt{2} \cdot 1$$

$$3 \cdot x^2 \cdot \frac{1}{x^2} = \sqrt{2} \cdot \sqrt{2} = 2$$

52. Expressions

$$= \frac{3}{4}, \frac{4}{3}, \frac{5}{3}, \frac{3}{5}, \frac{13}{7}, \frac{1}{1} = \frac{1}{7}$$

53. If $0.87 = a$ and $0.13 = b$ then,

$$\text{Expression} = \frac{a^3 \cdot b}{a^2 \cdot b^2 \cdot b}$$

$$\frac{(\sqrt{b}(\sqrt{b^2 - a}))}{a^2 \cdot \sqrt{a}}$$

$$= \frac{0.8 + 0.1}{0.8 + 0.1} = 1$$

54. $x^2 - x + 2 + 6 = 1$
 $5x^2 - x + 2 + 6 = 0$

$$x^2 - x + 1 = 0$$

$$\text{and, } y + 3 = 0 \Rightarrow y = -3$$

$$x^2 - y^2 = 1 + 9 = 10$$

5. $\sqrt{7} \cdot \sqrt{5} = \frac{1\sqrt{7} \cdot \sqrt{5} \cdot 21\sqrt{7} \cdot \sqrt{7}}{\sqrt{7} \cdot \sqrt{5}}$

$$= \frac{2}{\sqrt{7} \cdot \sqrt{5}}$$

similarly,

$$\sqrt{5} \cdot \sqrt{3} = \frac{2}{\sqrt{5} \cdot \sqrt{3}}$$

$$\sqrt{9} \cdot \sqrt{7} = \frac{2}{\sqrt{9} \cdot \sqrt{7}}$$

$$\sqrt{11} \cdot \sqrt{9} = \frac{2}{\sqrt{11} \cdot \sqrt{9}}$$

$$\text{Largest number} = \sqrt{5} \cdot \sqrt{3}$$

because its denominator is the least.

56. $x^{\frac{1}{3}} \cdot y^{\frac{1}{3}} = \frac{1}{3}$

Considering this, we have,

$$(x + y - z) = \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3}$$

Solved Paper

Cubing again,

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

57. Let $\sqrt{7\sqrt{7\sqrt{7\sqrt{7\sqrt{\dots}}}}}$

On squaring both sides,

$$x^2 - x = 5 \quad (-7)$$

$$5x = 7$$

$$x = \frac{7}{5}$$

$$7 = (x-1)^3 - (-3)$$

$$y-3$$

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

58. $x^2 = 2$

$$\sqrt{x^2} = \sqrt{2} \Rightarrow x = \sqrt{2} \vee -1$$

From Alternative (4)

$$\frac{a^2 \cdot 1}{3^2 \cdot a} = \frac{\sqrt{2} \cdot 1}{3 \cdot 2\sqrt{2}}$$

$$= \frac{\sqrt{2} \cdot 1}{3 \cdot 2\sqrt{2}}, \frac{3 \vee 2\sqrt{2}}{3 \cdot 2\sqrt{2}}$$

$$= \frac{\sqrt{2} \cdot 3}{9 \cdot 8} = \frac{1 \vee \sqrt{2}}{8}$$

59. In the sequence of first 100 natural numbers,

60. $1 + 5 = 13$
 $3 + 2 = 5$
 $1 + 1 = 2$
 $2 + 14 = 16$
 $46 + 17 = 63$

61. Effect on sale

$$= \left(\frac{0.9 \cdot 0.15 \cdot 20}{10} \right)$$

$$= \text{Percentage increase}$$

62. If the CP of a horse is Rs. x

$$\text{Then its SP} = \frac{115}{100}x$$

$$\text{New CP} = \text{Rs. } \left(\frac{3}{4}x \right)^3$$

$$3 \frac{115}{100}x \cdot 60$$

$$\frac{3}{4}x, \frac{3}{100} = \frac{99x}{100}$$

$$5 \frac{15x}{100} \cdot \frac{99x}{10} = 60$$

$$5 \frac{16x}{100} = 60$$

$$5 x = \frac{60 \cdot 100}{1} = \text{Rs. } 35$$

63. A' C = 33, $\frac{100}{12}, \frac{10}{120}, \frac{10}{110}$
 = Rs. 20

64. If the CP of a article is x, then

$$\frac{1}{x} - 100 = x^3$$

$$5 x^2 - 100 - 210 = 0$$

$$x - 10x - 30x + 210 = 0$$

$$5 (-70) - 30(x - 70) = 0$$

$$5 (x - 0)(x - 70) = 0$$

$$5 = \text{Rs. } 30 \text{ or Rs. } 70$$

65. Let the CP of a hat be Rs. x.

$$\frac{120}{100} \cdot \frac{0}{100} \cdot \frac{4}{100} \cdot \frac{100}{12}$$

67. CP of article = Rs.

3 Mark d price

$$= \frac{130}{100} = R. \frac{13x}{1}$$

3 S .

$$= \frac{13x}{10}, \frac{85}{10} = R. \frac{221x}{100}$$

$$3 \frac{221x}{20} = 84.5 \frac{21}{20} = 84$$

$$5 x = \frac{84, 20}{21} = R. 800$$

8. Mar e price = Rs. 8. then

$$\frac{, 95}{100} \frac{9}{10} \frac{110}{0} 5 x = R. 110$$

6 . (*) Initial expenditure of K ishnamurthy

$$5000, \frac{80}{100} R. 1200$$

New income

$$\frac{1500}{100} \frac{120}{100} = R. 18000$$

New expenditure

$$= \frac{1000}{100} \frac{12}{100} = R. 1440$$

3 Net savings = 1000 - 1440

= Rs 360

Note: It is not an answer choice

70. First number

$$= 100 \sqrt{\frac{5}{2} \frac{2.5}{2}}$$

Second number = 125

3 Required percentage

$$= \frac{225}{215}, 100 = 90$$

71. Percentage increase

$$= \left(\sqrt[2]{2} \sqrt[2]{\frac{2}{10}} \right)^4 \% = .04\%$$

72. Percentage of students appearing for both subjects

$$= 2 + 44 - 100 = 16$$

Let the total number of students be , then

$$\frac{, 1}{10} \cdot 0.5 x = \frac{400}{16} = 5$$

73. A : + = 2 : 5

$$34's \text{ share} = \frac{1050}{7} = R. 150$$

75. Net income = 5x and 6

$$H F = x = 4$$

$$3 C \times x$$

$$\times 6 \times 120$$

$$6 a + = 1$$

$$a^2 bc + c^2 = \frac{1}{3}$$

$$2^2 + 2^2$$

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

$$1\% - \frac{1}{3}$$

$$\text{Let } a = c = \frac{1}{3}$$

$$5 a : b : c = 1 : 1 : 1$$

77. Investment for y months then

$$\frac{5, 8}{6, y} = \frac{5}{1}$$

$$5 y = 12 \text{ month .}$$

$$9. l b 6 5 \dots(i)$$

$$lb 6 \dots(i)$$

$$l +$$

Solved Paper

$$\sqrt{961} = 31 \quad \dots\text{(iii)}$$

$$\begin{matrix} (b) & l & b & 2lb \\ 62 & 16 & 28 & \end{matrix}$$

$$3l - b = \sqrt{28} = 17 \quad \dots\text{(iv)}$$

From equations (ii) and (iv),
 $l = 8$

$$= \frac{4}{2} = 24 \text{ cm}$$

80. Volume of the cylinder = $\pi r^2 h$

$$l \times 3.14 \times 8 = 72 \text{ cm}^3$$

Volume of one coin

$$= l \times 0.75 \times 0.2$$

Number of coins

$$= \frac{72}{0.75 \times 0.2} = 640$$

$$14/r + 2/r^2 = 70$$

$$5(r+2) = r$$

$$5r^2 + 4r = 4r - 2$$

$$\frac{7}{4} = 5$$

$$5r = 56 - 4 = 52$$

$$5r = 13 \text{ (error)}$$

82. Required ratio = Volume of semi-sphere :

Volume of cylinder

$$= \frac{4}{3}r^3 : r^3 = 4 : 3$$

8. Time = 2 hours

Rate = 6%

$$= CI = P \left(1 + \frac{r}{100}\right)^n$$

$$= 625 \left(1 + \frac{6}{100}\right)^2$$

$$6250 \times 0.1236 = \text{Rs. } 772.5$$

$$85. 140 = P \left(1 + \frac{R}{100}\right)^3 \quad \dots\text{(i)}$$

$$166 = P \left(1 + \frac{R}{100}\right)^4 \quad \dots\text{(ii)}$$

Dividing equation (ii) by (i)

$$1 + \frac{R}{100} = \frac{166}{140}$$

$$3 \frac{R}{100} = \frac{166 - 140}{140}$$

$$= \frac{26}{140} = \frac{13}{70}$$

8. If the distance between school and home be x km, then

$$\frac{x}{3} - \frac{x}{4} = \frac{10}{60} \Rightarrow \frac{x}{12} = \frac{1}{6}$$

$$5x = 2, \quad 12 = \text{km}$$

$$87. 60 \text{ mph} = \left(\frac{5}{8}\right) \text{ m/s}$$

$$= \frac{0}{1} \text{ m/sec}$$

If the speed of second train is $\frac{5}{3}$ of the

$$\frac{5}{3} \times \frac{12}{1} = 20$$

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$$\times 3m + 7 \times 10w$$

- $2 \times 92w$
 $5 \times m911$
 $3 \times 4m + 6w - 50w$
 $1D_1 \times MD$
 $5 \times 5 \times 8 = 0 \times 2$
 $5 \times D_2 \times \frac{5, 8}{20} = 20 \text{ d y}$
9. A = 0
 B = 8
 C + A = 42
 On addition,
 $(A + B) = 0 + 38 = 2 \times 2$
 $5 \times A + \dots = 6$
 $3 \times A = A + (C) - B + \dots$
 $60 - 38 = 22$
91. Expenditure on housing and transport
 $= 15000 \times \frac{1}{100}$
 $= \text{Rs } 1000$
92. It is visible from the pie chart.
 Food = 23%, Others = 90%
93. Housing = 15%
 Savings = 15%

94. Required percentage
 $= 10 + 12 + 5$
 $= 27\%$
9. Expenditure on food
 $= \text{Rs. } \left(\frac{15000 \times 23}{100} \right)$
 $= \text{Rs. } 34500$
6. Required percentage
 $= \frac{100}{1200} \times 100 = 25$
97. Number of people skilled in 200
 $= 100 + 20 = 120$
9. It is obvious from the bar diagram.
 Required number of the dead = 100
9. It is obvious from the bar diagram.
 Required number of the dead = 50
100. Required average
 $= \frac{100 + 1050}{\dots}$