1. A General, while arranging his men, who were 6000 in number, in the form of a square, found that there were 71 men left over. How many were arranged in each row?

(a) 73 (b) 77
(c) 87 (d) 93

2. A number, when divided successively by 4, 5 and 6, leaves remainders 2, 3 and 4 respectively. The least such number is

(a) 50 (b) 53
(c) 19 (d) 214

3. A number, when divided by 296, gives 75 as the remainder. If the same number is divided by 37 then the remainder will be

(a) 1 (b) 2
(c) 19 (d) 31

4. The square root of

$$\frac{(0.75)^3}{1\%0.75}\forall_{\#}0.75\forall(0.75)^2\forall 1!$$

(a) 1 (b) 2
(c) 3 ( ) 4

5 The sum and pr duc of two numbe s a e 1 and 35 respe tiv ly. Th sum of their rec proc ls will be

(a) $\frac{1}{3}$ (b) $\frac{1}{5}$ (c) $\frac{12}{35}$ (d) $\frac{5}{12}$

6. If $a^2\forall b^2\forall\frac{1}{2}\quad\frac{1}{b}$, the t e a ue of $^2+b^2$ will be

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

7. f $\&_{*}x\forall\frac{1}{x}\ni^2=3$, hen

$\&_{*}x^3\forall\frac{1}{x^3}\ni+$ is equal to

(a) 3 (b) 2
(c) 1 (d) 0

8. $\frac{0.1,\ 0.1,\ 0.1\forall 0.02,\ 0.02,\ 0.\ 2}{0.2,\ 0\ 2,\ 0.2\forall 0.04,\ 0.04,\ 0.04}$ is qual to

(a 0.12 (b 0.25
(c) .500 ( ) .855

9. If $x\forall\frac{1}{x}=2$, then the value f $x^{\ 0}\ \forall\frac{}{100}$ i

( ) 2 b) 0
( ) (d −2

10. f $x^3+3x^2+3x=7$, then x is qu l to

a) 2 b) $\sqrt[3]{6}$
( ) 1 d) −1

11. If $2x\forall\frac{2}{x}=1$, then the value of $x^3\forall\frac{1}{x^3}$ is

a) $\frac{13}{8}$ ( ) $\frac{11}{8}$ (c) $\frac{11}{8}$ (d) $\%\frac{13}{8}$

12. The greatest num

$\sqrt{}\ \sqrt{}\ \sqrt{}\ \sqrt{}$

$\sqrt{}\qquad\sqrt{}$

$\sqrt{}\qquad\sqrt{}$

13. $\sqrt[3]{(13.608)^2 \times (13.392)^2}$ i equa to

(a) 0.6 (b) 0.06
(c) 1.8 (d) 2.6

14. $\frac{1}{\#1,2} \forall \frac{1}{2,3} \forall \frac{1}{3,4} \forall ... \forall \frac{1}{99,100 \exists}$ is equal to:

(a) $\frac{1}{9900}$ (b) $\frac{99}{100}$ (c) $\frac{100}{99}$ d) $\frac{1\ 00}{9}$

15 The sum of al th digits of th n mbe s from 1 to 100 is

(a) 5050 (b) 903
( ) 901 (d) 900

6. A s opkee er sell uge in suc a way hat th s llin p ice o 9 0g f suga is the ame as th os p ice of 1 kg of sugar. hat is his gain per cent?

(a) $5\frac{5}{19}$ (b) $5\frac{1}{5}$ c) 5 (d) $4\frac{}{19}$

17. erson bou h a horse and a arriag for Rs 2 000. Lat r, he so d the hor e a 20 profit a d he arria e at 0% loss. Th s, he g ined % in the who e t ansaction T e c st pri e of the orse was

(a Rs. 7200 (b Rs. 7500
(c Rs. 8000 d) Rs. 90 0

18. A s ll n rti le to B a 15% rofi . B ell it to C t 10% oss If C ays Rs. 51 . 0 for it t en A purcha ed it at

( ) Rs. 500 ( ) Rs. 750
(c Rs. 1000 ( ) Rs. 12 0

1 . An rt c e is s ld at a cert i fixed p ic . y sel ing t at $\frac{2}{}$ of hat p ice, on los s 1 %. Th g in per en o se ling it at th original price is

(a) 20 (b) $33\frac{1}{3}$
( ) $\frac{200}{9}$ d) 0

20. A se ls a ar tic e to B for Rs. 4 ,0 0 l sing 10% in t e trans ct on s lls it to C t a pr ce w ich w u d have given a ro it of 10 to A. B wha er cent does B gain?

(a) $\frac{75}{2}$ (b) $\frac{100}{3}$ (c) $\frac{20}{9}$ (d) $\frac{50}{7}$

21 Th c st pric o an ar icle is 8 % of ts m rked ric for sal . How mu h p r cent doe the trade man gain after all wi g a iscount of 12% ?

(a) 20 (b) 2
(c) 10 (d 8

22 A merchan ha annou ced 25% eb te on price of read -m de arment at t e i e of sale If a pu chas eeds to ave a re ate o Rs 400 then h w many shir s, ach c sting s. 320, should he purchase?

(a) 10 ( ) 7
(c) 6 (d 5

23. A mer h nt purchas s a wristw tch for R . 45 and fixes it ist r ce in a such way that a ter allo in a d scount f 10%, h ea ns a prof t o 20% Then the list p ic (i rupees) of the wristwatch is

(a) 500 (b) 600
( ) 750 (d) 80

24 A r du tio of 1 % n t e price f tea na les a dea er to purc ase 25 g more te for Rs 225 0. What is th re uc d price per g of tea?

a) Rs. 70 b) Rs. 80
c) Rs. 90 ( ) Rs. 10

25 Ra do ated 4 o is income o a chari y an d pos ted 0% o the est i a Ban . I now e ha Rs. 8640 left with him, then his ncome is

(a) R . 12,500 (b) R . 12,000
(c) R . 10,500 (d) s. 0,000

2 . I he length of a rectang e is ncr ase by 10% nd its bread h s decrea ed y 10%, then its a ea

a) decreases by 1% b) increases by 1%
c) decreases y 2%
(d) re

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 $\pi = \frac{22}{7}$)
(a) $\frac{77}{3}$ (b) 75 (c) 77 ( ) 80

34 A wi e, w en ben in he f rm of a square, n loses r gion of rea 21 cm^2 If the am wire is b nt nto he f rm of a circ e, then th are of th c rcle is (Us $\pi = \frac{22}{7}$)
a) 150 cm2 b) 152 cm2
c) 154 cm2 d) 159 cm

35. he r ti f the re f a se tor o a c rc e t the ar a f t e ir le s 1 4 If the a ea of he ci cle is 154 cm , he erimeter of t e secto is
(a) 20 cm (b) 25 cm
(c) 36 m (d) 40 cm

6. T e length of t e di go a of a ube is 6 m. T e vo ume of t e cube (in cm^3) is
(a) $18\sqrt{3}$ (b) $24\sqrt{3}$
( ) $8\sqrt{3}$ (d) $3\sqrt{3}$

3 . If a p er of rad us r is divided in o four dent cal parts then t e to al su face area f the fou parts is
(a) $4\pi r^2$ quare nit (b) $2\pi r^2$ square unit
(c) $8\pi r$ squar unit (d) πr^2 sq are un t

38. A sum of mone , de osited t s me ra e er cent p r annum of compo nd int re t double i sel in years. I h w many ye rs wil i becom 1 ti es of it elf at the same rate ?
(a) 16 ( ) 1
(c) 0 (d) 8

39. Wh t is th difference between he c mpound interest and s mple in er st n Rs. 000 a 5% p r annum for 2 years ?
(a) 10 (b 11
(c) 2 (d) 00

40. The simple an c mpou d ntere ts n a sum of one for 2 year are s. 8400 and Rs 86 2 re pe tively. he rate f interest per annum is
(a) 6

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. $\frac{\sqrt{7}}{\sqrt{16+6\sqrt{7}}-\sqrt{16-6\sqrt{7}}}$ 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) 6 85 cm^2 (b) 8 55 cm^2
(c) 2 70 cm^2 (d) 11 25 cm^2

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) 2 5

50. If $2x+\frac{1}{x}=6$, then $3x-\frac{1}{2x}$ is equal to
(a) 4 (b) 8
(c) 9 ( ) 2

1. If $x=(\sqrt{2}-1)^{-1}$ then the value of $(x^2-\frac{1}{x^2})$ is
(a) 2 (b) $-2\sqrt{2}$
(c) $2\sqrt{2}$ (d) -2

2. $\frac{3}{4}(1+\frac{1}{3})(1+\frac{2}{5})(1-\frac{2}{5})(1+\frac{6}{7})(1-\frac{2}{13})$ is equal to
(a) $\frac{2}{13}$ (b) $\frac{}{7}$ (c) $\frac{1}{}$ (d) $\frac{1}{5}$

53. $\frac{(0.87)^3+(0.13)^3}{(0.87)^2-(.1)^2-0.7\times(0.1)}$ is equal to
a) $\frac{1}{2}$ ( ) 2 (c) ( ) $2\frac{1}{}$

54. If x^2+y^2-2x

55. The largest among the numbers

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

(a) $\sqrt{7}\%\sqrt{5}$ (b) $\sqrt{5}\%\sqrt{3}$

(c) $\sqrt{9}\%\sqrt{7}$ (d) $\sqrt{1}\%\sqrt{9}$

56 I $x^{1/}\ \ y^{1/3} = z^{1\ 3}$, t e $x + y -)^3 + 7xyz$ s equal to

(a) 0 (b) 1

(c) –1 (d 27

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

t en y s equ l to

(a) $\frac{2}{3}$ (b) 1

(c) $\frac{4}{3}$ (d $\frac{3}{4}$

8 If $a^2 = 2$, t en $(a+1)$ s equa o

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

(c) $\frac{a \forall 1}{3\%2a}$ (d) $\frac{a\%}{3\%2a}$

5 . The mi sin term in th s qu nce 2 3, 5, , 1 , ... 17, 19 is

(a) 16 (b) 15

(c) 4 (d) 1

60. The wr ng umber in the sequence

(a) 32 (b) 47

(c) 6 (d) 3

61. W en t e p ice of a toy as inc eas d by 20 , he n mber of oys sold wa dec ease by 5%. What w s ts ffect on the ota sales of t e shop?

(a) 2% ncrease (b) 2% ecrease

(c) 4% ncrease (d) 4% decrea e

62. erson so d a ho se at a gain f 15%. Ha he oug t it for 25% es an sold it fo R . 601 ss, e wo l have ad a prof t of 32%. T e ost price of the ho se was

(a) s. 370 (b) s. 372

(c) s. 375 ( ) Rs. 78

3. A sel s n ar i le t B at ain of 5% B se l it t C at ga n of 20 a d ell it o at a ga n of 1 %. f D pay Rs 330 fo it h w muc d d it cost to A ?

(a) s. 200 (b) s. 250

(c) s. 275 (d Rs. 290

4. y selli g a ar icl or s. 21, a man ost uch that t e pe cen age l ss wa equ l to th co t pr ce. The cos priceo the arti le wa

(a) s. 30 or Rs 7 (b) s. 35 or Rs. 60

(c Rs. 45 (d) s. 50

6 . Half of 100 rtic es w re sol at a pro it f 20% an he res a a p of t o 40%. If al th arti les ad b en sol a a p ofit of 5%, th total prof t wo ld ave been Rs. 100 les than ea lie pro it. T e ost price o each arti le was

(a Rs. 10 (b Rs. 15

(c Rs. 20 (d Rs. 30

6. The ma k t pri e f a clock is Rs. 20 . It is o b sol a Rs 2448 at two success ve isc unts. If the f rs dis ount is 10%, t en the se ond discount is

(a) 5% (b) 10%

(c) 5% (d) 2 %

67. A dea er ma ks is go ds 0% above is ost p ice an th n allows 15 discou t n i . Wha is t e os price f n artic e on hic he gains R . 84 ?

(a) s. 800 (b) s. 560

(c) Rs. 373.33 ( ) Rs. 280

68 A shop ee er w sh s to give 5% com ission n the ma ke price f a article ut also a ts to ar a p of t o 10% If his cos pr ce is Rs. 95, th n the marked p ice is

(a) s. 100 (b) s. 110

(c) s. 120 (d) Rs. 130

69. rishn mur hy ea ns s. 15000 per mo th a d pen s 8 % f i . Due to pay revisio , his m nth y income as increas d b 2 %, but due t p ice ri e, he has to s end 20% ore. Hi new savi gs are

(a) R . 3400 (b) R . 3000

(c) R . 46

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 tookboth 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 recived profits in the ratio 5 : 9. Binvested 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 $6\sqrt{3}$ cm ?
(a) $6\sqrt{3}$ cm (b) 6 cm
(c) 5.4 cm (d) $3\sqrt{6}$ 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 m2. What is the radius of the original sphere?
(Use / 0 $\frac{22}{7}$ +
(a) 1 m (b) 1 m (c) 1 m (d) 3 m

82 A right ircular yl nder is circum cribing a he isph re s ch th t the r bases ar com on. T e atio f their volume s
(a) 1 : 3 (b) 1 : 2
(c) 2 : 3 (d) 3 : 4

3. A man nves ed $\frac{}{3}$ of his ca ita at 7% $\frac{1}{4}$ t 8% and the r ma nin at 0% rate of simple i te est If his annu linc me from int res s is s. 61, the capital nvested w s
(a) Rs. 60 0 (b) Rs. 56 0
(c) Rs. 66 0 (d)

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) 4km

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

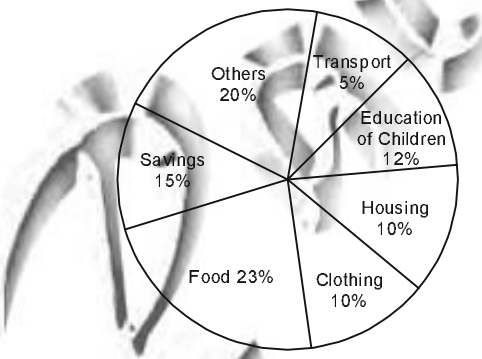
88. A and B together can complete a piece of work in 12 days and B and C together in 15 days. If A is twice as good a workman as C, then in how many days will be alone complete the same work ?
(a) 30 (b) 25
(c) 24 (d) 20

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

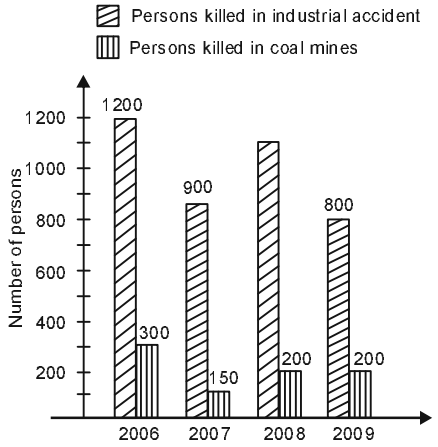
92. Maximum expenditure of the family other than on food, was on
(a) Housing (b) Clothing
(c) Others
(d) Education of children

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

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 Numbe o me arrange i eac row
$\sqrt{5929}$ 77

2. Remainder
2

4

10
1 53
5 214

4. $\frac{(0.75)^3}{1 \quad 0.7}$ $[(0.75)^2 \quad 0.75 \quad 1 \quad 1]$

$$= \frac{(0.75)^3 \forall (1 \quad 0.75)[(0.75)^2 \forall 0.75 , 1 \forall 1^2]}{1 \% 0.75}$$

$$= \frac{(0.75)^3 \forall 1^3 \% (0.75)^3}{0\ 2}$$

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

$$= \frac{1}{1 \% 0.75} = \frac{1}{0.\ 5} = \frac{100}{25} \quad 4$$

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

5. $x + y = 12$ ...(i)

$xy = 35$ . .(ii)

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

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

5 $4^{\ 2} \forall \frac{1}{2} \forall b^2 \forall \frac{1}{b^2} = 4$

5 $a \% \left(\frac{1}{a}\right) \quad 2 \forall \left(\frac{1}{b}\right)^2 \forall 2 = 4$

$\left(a \% \frac{1}{a}\right) \quad \left(\% \right)^2 = 0$

5 $a \% \frac{1}{a} = 0,\ b \% \frac{1}{b} =$

5 $a = b = +1$

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

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

$4x \forall \frac{1}{x} \quad \sqrt{3}$

No , $x^3 \forall \frac{1}{x}$

$= \left(x \forall \frac{1}{x}\right)^3 \% x.\frac{1}{x}\left(x \forall \frac{1}{x}\right)$

$= \left[\sqrt{3}\right]^3 \% 3\sqrt{3}$

$= 3\sqrt{3} \% 3\sqrt{3} = 0$

8. If 0.1 = 1 then, 0. $= 2a$

and 0 0 = he , $0.04 = 2b$

3 E pr s i n

$$\frac{, a \quad \forall b , b}{a , 2 \quad a \forall 2b \quad b , 2}$$

$$\frac{a^3 \forall}{8a^3 \forall \ b} = \frac{a^3 \forall b^3}{(a^3 \forall b^3} = \frac{1}{8} = 0.125$$

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

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

5 $(x + 1^{\ 3} \quad 2^3$

$x + \quad 2$

5 $x \quad 1$

1. $x \forall \frac{2}{x}$

5 $x \forall \frac{1}{x} = \frac{1}{2}$ ...(i)

3 $x^3 \forall \frac{1}{x^3}$

= ^{3} — — —

— —

— — ——— —

s of the surds = LCM of 2, 3, 5 and 7 = 210

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

$4^{\frac{1}{3}} = 4^{\frac{70}{210}} = \left(4^{70}\right)^{\frac{1}{210}}$

$2^{\frac{1}{5}} = 2^{\frac{42}{210}} = \left(2^{42}\right)^{\frac{1}{210}}$

$3^{\frac{1}{7}} = 3^{\frac{30}{210}} = \left(3^{30}\right)^{\frac{1}{210}}$

3 4The largest number

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

13. Exp ession

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

$= \sqrt[3]{(13.608 \forall 13.392)(13.60 \ \%13.392)}$

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

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

$= \frac{3 \ 6}{10} = 1.$

16. Pr fit per cent

$= \frac{\text{True weight } \% \text{False weight}}{\text{False weight}} , 1 \ 0$

$\frac{1000 \%950}{950} \ 100$

$= \frac{1 \ 0}{1} = \frac{5}{19}$

17. f he P f hors b Rs. x, h n CP of car i ge = Rs. $(20000 - x)$

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

$= 0 \ 00 , \frac{102}{10}$

5 120 + 8 0000 – 0

= 204000

$30x = 2 \ 4 \ 000 - 180 \ 000$

240000

3 $= \frac{240000}{3} =$ s. 00

1 . I a article is old o B a x% prof t/ o s nd sells the s me to C at y% pro it/loss, then C's C.P

$= ' \ CP\left(\frac{\&100 6 x}{100}\right) + \left(\frac{\& 00 6 y}{100}\right) +$

3 A's CP = C's CP

$\left(\frac{100}{*1 \ 0 \forall 15 +}\right)\left(\frac{\& \ 100}{00 \%10 +}\right)$

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

19. e th C P. o t e a ticle be Rs. 1 0.

3 S.P. o th art cl $\times \frac{}{3} = 90$

3 S P. of t e articl

$= \frac{90 , 3}{} = 135$

3 Pro it er ce t a the riginal pric = 5

20. A s C P.

$= 450 \ 0 , \frac{10}{90} =$ Rs. 50000

3 B's S.P.

$= 5 \ 00 \ \ \frac{110}{100}$

= Rs. 5 0 0

3 's rofit er ce

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

S afte th discount

Rs. $\left(\frac{125 \quad 88}{100} +\right) =$ Rs. 10

3 Gain p r cent 10

3. If t e mar ed pri e of he wr st watch be Rs. x, th n

$x , \frac{90}{100} = \frac{50 , 1 0}{0} = 540$

5 $x = \frac{5 0 , 100}{90} =$ s. 00

24. Let the o ig nal pr ce f tea b Rs. / g

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

3 $\frac{\frac{22500}{9x}}{1} \quad \frac{22500}{x} = 25$

5 22 00 $\left(\frac{10}{x} \% \frac{1}{x} +\right) = 2$

5 2 500 $\left(\frac{0 \%}{9x} +\right) = 25$

5 22500 25 × 9

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

New rice

$= \frac{}{10}$ 1 0 = Rs. 90 per kg

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

D na ion t charity = R . 4

Amount e osi e in a k

$= \frac{6 , 10}{10} =$ s. 9 6

avi gs 100 – 13.6 = Rs. 8 .4

Q Rs. 86.4 = 100

R . 864 $= \frac{100}{86.} , 8640$

= Rs. 1 000

26. Ef ect n are

$= \left(10 \% 10 \quad \frac{10 , 10}{100 \ 4} +\right) \%$

= 1%

H re, n vative sign show decr as .

7. Vo me o h new bal

$= \frac{3}{4} , \frac{}{3} (r^3 \forall \frac{3}{2} \forall r_3^3)$

$(1^3 + 2^3 + 3)$

= / (+ 8 + 27)

= 6p c bic cm.

$\frac{4}{3} / \quad = 36$

5 $r = \frac{6 \ 3}{4} = 2$

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

30 7y a s g , A sag x e rs a d 's ge = $5x$ ears

$\frac{4x \forall 4}{1} = \frac{}{6}$

5 2 x + 70 = 24x + 84

5 $x = 84 – 7 = 14$

3 B's prese t age

= 5 + 7 = × 1 + 7 77 ye

– –

tal profit

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

3 A s sha e = R . $\left(1 + \frac{1}{*}\right)^{}$, 12000

= Rs. 40 0

3 . Si e of th squ re

$\sqrt{1\ 1} = 11$ m

3 Len th o h ire = × 11

4 m

3 2/ r = 4

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

5 = 7 c

3 Are of ci cle = / ^{2}

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

= 54 q. c .

3 . If the ge e fe of the c b e x c t en,

$\sqrt{3}x = 6$

$x = \frac{6}{\sqrt{}} = 2\sqrt{3}$ c

3 Volume f the c be = (edge)^3

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

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

3 . Requ red t t l sur ace area

= 4/ r^2 + 4 × / r^2

= 8/ r^2 sq.u it

39. D fference

= rin ipal $\left(\frac{r}{*100}\right)^2$ = 4 00 $\left(\frac{5}{*100}\right)^2$ = R . 1

40. iffe e ce = Rs. (8652 – 84 0) = Rs. 252

Rate = $\frac{2, \text{D ff rence}}{\text{S.I.}}$, 00

$= \frac{2\ 52}{400} 1\ 0 = 6$

4 . atio f heir effic e c

= 1 0 : 60 = : 8

3 Ratio of time taken = 8 : 5

T me aken b

= 12, $\frac{5}{8} = \frac{5}{2} = \frac{1}{2}$ d ys

4 . Cap city o t e tank = gallons

3 Part of t e tank fille i 1 minute

$= \frac{x}{4} \forall \frac{x}{40}$ 30

3 6 $\left(\frac{x}{*24} \forall \frac{x}{4} \%3\right)^{} = x$

3 $\frac{x}{24}$ $\frac{x}{0} \% \frac{x}{6} = 30$

5 $\frac{x \forall 3x \quad 2x}{12} = 30$

5 $\frac{}{20}$ =3 x = 6 0 ga lons

45. A erage o he b t m n upto 11th i nings

= 3 – 12 × 2 = 39

3 equi e av rag = 3 2 = 41

4 . R qui ed num er

= H F of (91 – 43), (183 – 91) and (183 – 43)

= HCF o

$\frac{\sqrt{}}{\sqrt{\ \sqrt{}}\ \sqrt{\ \sqrt{}}}$

$\frac{\sqrt{}}{\sqrt{\ \sqrt{}}\ \sqrt{\ \sqrt{}}}$

$\frac{\sqrt{}}{\sqrt{\ \%\ \%\sqrt{}}}$

$$= \frac{\sqrt{7}}{3\forall\sqrt{7}\ \%3\forall\sqrt{7}} = \frac{1}{2}$$

48. Requi ed u = 0 + 1 + . + 2 ^{2}

= 1 + 2 + . + 2 ^{2} − 1 + 2 + . + 19)

$$= \frac{29(29\forall 1)(2,\ 29\forall 1)}{6} \%\frac{19(19\forall 1)(2,\ 19\forall 1)}{6}$$

$$\_Q\ 1^2 \forall 2^2 \quad ..\forall\ ^2\ 0\ \frac{n(\ \forall 1)(2n\forall 1)!}{6}\ \exists$$

= 8555 – 2470

= 608 sq.cm.

49. Expression

$$= \frac{9.5,\ 0\ 008\ ,\ 18.9}{0.00\ 7,\ 1.9,\ 2.}$$

= 225

3 Requir d squa o t

$\sqrt{\ 25}\quad 1$

5 . $x = \lfloor\sqrt{2}\quad 1\rfloor^{\%\frac{1}{2}}$

5 $x - 2\quad \sqrt{2}\ \%1$

$$3\quad ^2 = \frac{1}{\sqrt{\ }\ \%1} = \frac{1}{\sqrt{2}\ \%1},\ \frac{\sqrt{2}\forall 1}{\sqrt{2}\forall 1}$$

$= \sqrt{2}\forall 1$

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

$$3\quad x^2\ \%\frac{1}{x^2} = \sqrt{\ }\forall 1\quad \sqrt{2}\forall 1$$

52. xpre s o

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

53. If 0.87 = a and 0.13 = b t e ,

xpre s on = $\dfrac{a^3\quad b}{a^2\forall b^2\ \%\ b}$

$$\frac{(\ \forall b\ (\quad \forall b^2\quad a\ )}{a^2\forall\quad a}$$

= 0 8 + 0 1

54 $x - x + {}^2 + 6\quad 1$

5 $x\quad 2\quad 1 + {}^2 + 6\quad = 0$

$x -)\ +(\quad)\quad 0$

$= x - 1 = 0\ 5\quad x = 1$

and, $y + 3 = 0\ 5\quad y = -3$

$x^2\quad y^2 = 1 + 9 = 0$

5. $\sqrt{7}\ \%\sqrt{5} = \dfrac{\lfloor\sqrt{7}\ \%\sqrt{5}\rfloor\lfloor\sqrt{7}\forall\sqrt{\ }}{\sqrt{7}\forall\sqrt{5}}$

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

im lar y,

$$\sqrt{5}\ \%\sqrt{3} = \frac{2}{\sqrt{5}\forall\sqrt{3}}$$

$$\sqrt{9}\quad \sqrt{7} = \frac{2}{\sqrt{9}\forall\sqrt{7}}$$

$$\sqrt{11}\ \%\sqrt{9} = \frac{2}{\sqrt{11}\forall\sqrt{9}}$$

Lar est nu be = $\sqrt{5}\ \%\sqrt{3}$

because its denominato s t e s a lest.

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

Cu i g b th s des, we have,

– – – – – –

– – –

$$(x + y - z) = \%3.x^{\frac{1}{3}}.y^{\frac{1}{3}}.z^{\frac{1}{3}}$$

Cubing again,

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

(z) 2 xy 0

57. Le $\sqrt{7\sqrt{7\sqrt{7\sqrt{7....}}}}$

O squarin bot sides,

x $7x$

5 $^2 - x =$ 5 (-7

5 $x = 7$

$7 = ($ ^{3} 1 3 -3

$y - 3$

5 3 4

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

5 . $^2 = 2$

$\sqrt{\ }$

5 $a +$ $= \sqrt{2} \forall 1$

From lternative (4)

$$\frac{a\%1}{\%2a} = \frac{\sqrt{2}\%1}{3\ \ 2\sqrt{2}}$$

$$= \frac{\sqrt{2}\%1}{3\%2\sqrt{\ }}, \frac{3\forall 2\sqrt{2}}{3\ \ 2\sqrt{2}}$$

$$= \frac{\sqrt{2}\%3\ \ 4\%2\sqrt{2}}{9\%8} \quad 1\forall\sqrt{2}$$

5 . It i sequence off r t prim u b rs.

6 . $+ 5 = 13$

$3 +$ 2

$1 +$ $1 =$ 2

$2 + 14 = 46$ 7 7

$46 + 17 = 63$

61. Eff ct on sale

$$= \left(\frac{\&}{*} 0\%15\%\frac{20\ ,\ 15}{10}\right)$$

= % i creas

62. f h CP of hor e e Rs. x

t en its SP $\frac{115}{100}x$

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

3 $\frac{11\ x}{100}\%60$

$\frac{3}{4}x\ ,\ \frac{3}{00} = \frac{99x}{1\ 0}$

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

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

5 $x = \frac{60\ ,\ 00}{1} =$ Rs. 3 5

63 A′ C = 33 , $\frac{100}{12}$, $\frac{1\ 0}{120}$, $\frac{1\ 0}{110}$

= R . 20

6 . If h CP f art c e b s. , then

$\frac{\%\ 1}{x}$ $00 = x^3$

5 $^2 -$ 00 21 0 = 0

$x -$ 0$x - 30x +$ 2 0 0

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

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

5 = Rs. 30 or Rs. 70

65. Let th CP of a h a t cle e Rs. x.

$\frac{120}{100}$ $\frac{0\ \ 4}{00}$ $\frac{100\ \ 12}{}$

67. CP of article = Rs.

3 Mark d pric

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

3 S. .

$= \frac{13x}{10}, \frac{85}{10} = Rs.\ \frac{221x}{00}$

3 $\frac{221x}{2\ 0} = 84\ 5\ \frac{2\ 1}{2\ 0} = 84$

5 $x = \frac{84, 2\ 0}{21} = Rs.\ 800$

8. Mar e pr c = Rs. 8. then

$\frac{, 95}{100}\ \frac{9\ \ 110}{0}\ 5\ \ x = Rs\ 110$

6 . (*) Initia e penditure of K ishnamurthy

$5000, \frac{80}{100}$ Rs. 12 00

New income

$\frac{15\ 00\ \ 120}{100} = Rs.\ 18000$

N w expenditur

$= \frac{1\ 000\ \ 12}{100} = Rs.\ 1\ 4\ 0$

3 Ne avings = 1 000 – 144 0

= Rs 36 0

N te: It is not an answe choice

70. First number

$= 100 \forall \frac{5}{2}\ \ \frac{2\ 5}{2}$

S cond num er = 125

3 R quired perc ntage

$= \frac{225}{2\ \ 1\ 5}, 100 = 90$

71. Pe centage o increase

$= (\ 2 \forall 2 \forall \frac{2, 2}{10} + \ )\ \% = .04\%$

72 Per entage of stu en s op i g f r both ubj cts

= 2 + 44 – 00 = 16

l t e otal number of t d nts be , then

$\frac{, 1}{1\ 0}\ \ 0\ 5\ \ x = \frac{40\ 0}{16} = 5$

73. A : + = 2 : 5

3 4A's s ar $= \frac{}{7}\ \ 1050 = R\ .\ 3\ 0$

75 N m e s = 5*x* a d 6

H F = *x* = 4

3 C × *x*

× 6 × 120

6 *a* + = 1

$a\ \ bc + c = \frac{}{3}$

$^{2}\ \ ^{2} + \ ^{2}$

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

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

l a l , *a* = $c = \frac{1}{3}$

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

77. I nv sted for *y* m n hs hen

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

5 $y = 12$ month .

9. *l* *b* 6 5 ..(i

lb 6 . .(i)

l +

$\sqrt{961}$ 31 ...(iii)

(b) l b $2lb$

62 16 28

3 $l - b = \sqrt{28} = 17$ ...(iv)

Fr m equatio s (ii) a d (iv),

l = 8

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

80. Vol me of he cylin e = / h

/ × 3 8 = 72/ cm^3

ol me f one o n

= / × 0 75) × 0.2

N mber o coins

$= \frac{72/}{, 0.75, .75 \quad 0.2} = 640$

1 4/ $r + 2^2$ / $r^2 = 70$

5 $(r + 2)$ r $\frac{0}{4/}$

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

$\frac{7\ 4}{4, \quad 2} = 5$

5 $4r = 56 - 4 = 52$

5 $r = 13$ e re

82. R qu red ratio = Volume f emi-sphe e : V l me o y iner

$= \frac{}{3}/^3 : r^3 = 2:$

8 . T 2h lf years

R te = 6%

$= \text{CI} \quad P\left(1 \quad \frac{r}{1\ 0}\right)^2 \% \quad !$

$= 625 \quad \left(1 \forall \frac{6}{100}\right)^2 \% \quad !$

6250 × 0.1236 = Rs. 7 2.5

85. 14 0 = $P\left(1 \forall \frac{R}{00}\right)$ ...(i)

16 6 = $P\left(1 \forall \frac{R}{100}\right)^3$ ..(ii)

Dividing e uat on (ii) y (i)

$1 \forall \frac{R}{1\ 0} \quad \frac{1606}{1\ 60}$

$3 \quad \frac{R}{100} = \frac{1\ 0\ \%146}{1460}$

$= \frac{146}{1460} = \frac{1}{10}$

8 . f the d s ance be ween t e school an home be x m, hen

$\frac{}{3} \% \frac{x}{4} \quad \frac{10}{60} 5 \quad \frac{x}{1} = \frac{1}{6}$

5 $x \quad \frac{}{6}, 12 = \quad$ km

87. 60 mph = $\left(\frac{0, 5}{8}\right)$ m s c

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

If the spe d f second t ai e / ec he

$\frac{5}{3} \% \quad \frac{12}{} \quad —$

— —

———

× 3m + 7 × 10w

2 92 w

5 m 9 11

3 4m + 6w 50w

$_1D_1$ M D

5 5 × 8 = 0 $_2$

5 D_2 $\frac{5\ ,\ 8}{20}$ = 20 d y

9 . A 0

B 8

C + A = 42

On a d n ,

(A + B) 0 + 38 2 2

5 A + = 6

3 A = A + C) – B +)

60 – 38 = 22

91. xp nditure on ousing and transport

= 150 00 , $\frac{1}{100}$

= Rs 1 000

92. I is bvi us rom the pi char .

Food 23%, Others 9 0%

93. Housi 9 15%

Savings 15%

94. Requ re er e ta e

= 10 + 12 + 5

= 2 %

9 . Expe diture on food

= Rs. $\left(\frac{\&150\ 00\ ,\ 23\ni}{100}\right)$

= Rs. 34500

6. Required ercentage

= $\frac{00}{1200}$, 00 25

97. um er of per o s k l ed in 200

= 00 + 20 = 1 00

9 . It is obvious from he bar di gra .

Req i ed number of the dea = 1 00

9 . It is obvious from he bar di gra .

Req i ed number of th dead = 50

100. Required ave age

= $\frac{1\ 00\ \ 1050}{\qquad\qquad\qquad}$