

1. Length of a rectangle is three-fourth of the side of a square whose area is 784 cm^2 . If breadth of the rectangle is 9 cm less than its diagonal then find the volume of a cylinder whose base diameter is same as length of the rectangle and height of the cylinder is 20% more than breadth of the rectangle.
 (a) 8316 cm^3 (b) 8136 cm^3
 (c) 8396 cm^3 (d) 8356 cm^3
2. Find the area of a trapezium whose parallel sides are 8 cm and 12 cm, and height is same as the radius of circle whose perimeter is 88 cm^2 . (use $\pi = \frac{22}{7}$)
 (a) 170 cm^2 (b) 312 cm^2
 (c) 140 cm^2 (d) 242 cm^2
3. From a cylindrical log whose height is equal to its diameter, the greatest possible sphere has been taken out. What is the fraction of the original log which is remaining?
 (a) $\frac{1}{2}$ (b) $\frac{1}{3}$
 (c) $\frac{1}{4}$ (d) $\frac{2}{3}$
4. A solid cone of radius 9 cm and height 12 cm is cut by a plane at some distance from its base, so the cone breaks into two different pieces (small cone and frustum). If ratio of volume of small cone to large cone is 1: 27, find the approximate per cent increase in the cumulative total surface area of these two pieces of the cone from the original piece.
 (a) 12.33% (b) 18.33%
 (c) 16.33% (d) 8.33%
5. The area of a rhombus is 960 cm^2 . If the ratio of the diagonals is 8: 15, what is the perimeter of the rhombus?
 (a) 108 cm (b) 120 cm
 (c) 132 cm (d) 136 cm
6. The radius of a cone and a cylinder are in the ratio $4\sqrt{3}:5$, respectively. The ratio of height of the cone to that of the cylinder is $2\sqrt{5}:3$. Find the ratio of volume of cylinder to that of cone.
 (a) $12\sqrt{5}:13$ (b) $8:9\sqrt{5}$
 (c) $8:15$ (d) $15\sqrt{5}:32$
7. A right circular cylindrical container with radius 21 m is surmounted by a right circular conical container with same radius as that of the cylindrical container to form container 'P'. The height of the cylindrical container and the conical container is 28 m and 14 m, respectively. Find the volume of the container 'P'.
 (Use $\pi = \frac{22}{7}$)
 (a) $45,276 \text{ m}^3$ (b) $44,276 \text{ m}^3$
 (c) $48,276 \text{ m}^3$ (d) $40,276 \text{ m}^3$
8. A cuboid is cut vertically such that its length got halved. Originally, the length and breadth of the cuboid are in the ratio 8:5, respectively. The height of the cuboid is 40% less than its breadth. If the total cost of painting lateral surface of the two cuboids (obtained after cutting), one at the rate of Rs. 4/m² and other at the rate of Rs. 5/m² is Rs. 4374, then find the length of the cuboid before cutting.
 (a) 16 metres (b) 24 metres
 (c) 18 metres (d) 32 metres
9. The ratio of the radii of a cone and a cylinder is 3: 5, respectively. The height of the cone is 20% more than that of the cylinder. Find the ratio of their volumes.
 (a) 15:7 (b) 113: 15
 (c) 122: 17 (d) 125:18
10. A cylinder is circumscribed about a hemisphere and a cone is inscribed in the cylinder so as to have its vertex at the centre of one end and the other end as its base. The curved surface area of the hemisphere, cylinder and the cone are respectively in the ratio of:
 (a) $\sqrt{2}:1:\sqrt{2}$ (b) $\sqrt{3}:\sqrt{2}:1$
 (c) $\sqrt{2}:\sqrt{2}:1$ (d) None of these
11. A sphere is placed inside a right circular cylinder made of a metal of density 4 gm per cubic cm, so as to touch the top, base and lateral surface of the cylinder. If the radius of the sphere is 24 cm, then the weight (kg) of the cylinder is:
 (a) 100.192 kg (b) $110.192\pi \text{ kg}$
 (c) 100.592 kg (d) 110.592 kg
12. A cylindrical water tank of radius 24 cm contains water to a depth of 50 cm. A spherical iron ball is dropped into the tank and thus the level of water is raised by 4 cm. What is the radius of the balls?
 (a) 10 cm (b) 12 cm
 (c) 14 cm (d) 16 cm

13. A cylindrical vessels open at the top contain water up to $\frac{1}{5}$ of its height. A heavy sphere whose diameter is equal to the height of the cylinder is placed into the vessel touching its curved surface area from all sides. Then which is the correct statement is:

(a) water stands at above the half the height of the vessel
(b) water stands at below the half the height of the vessel
(c) water stands at the top of the vessel
(d) water overflow out of the vessel

14. A tent is in the form of a right circular cylinder surmounted by a cone. The diameter of cylinder is 30 m. The height of the cylindrical portion is 9 m while the vertex of the cone is 17 m above the ground.

Find the area of the canvas required for the tent.

(a) 1650 m^2 (b) 1660 m^2
(c) 1680 m^2 (d) 1690 m^2

15. A tent is in the form of a right circular cylinder surmounted by a cone. The diameter of cylinder is 30 m. The height of the cylindrical portion is 9 m while the vertex of the cone is 17 m above the ground.

How many metres of cloth, 5m wide, will be required for a conical tent?

(a) 155 m (b) 160 m
(c) 165 m (d) 170 m

16. A cone of a radius 17 cm is filled with water. If the water poured in a cylinder of radius 25 cm, the height of the water rises 12 cm, find the height of the cone.

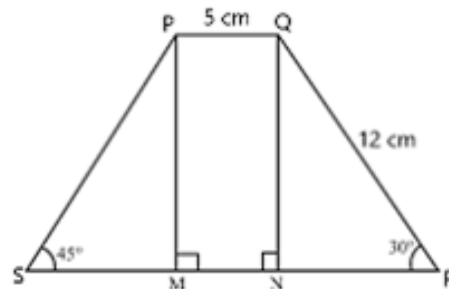
(a) 72.85 cm (b) 67.85 cm
(c) 77.85 cm (d) 87.85 cm

17. In a trapezium ABCD, AB is parallel to CD. If E is midpoint of side AD and F be a point on BC, such that EF is parallel to AB, then which of the following option is correct:

(a) $EF = AB + CD$ (b) $EF = \frac{1}{2}(AB + CD)$

(c) $EF = \frac{1}{3}(AB + CD)$ (d) None of these

18. Find the area of the trapezium PQRS.



(a) $48 + 16\sqrt{3} \text{ cm}^2$ (b) $46 + 18\sqrt{3} \text{ cm}^2$
(c) $48 + 18\sqrt{3} \text{ cm}^2$ (d) None of these

19. The length of a side of a rhombus is 53 cm and one of its diagonal is of length 90 cm, find the height of the rhombus?

(a) 42.55 cm (b) 44.55 cm
(c) 47.55 cm (d) 49.55 cm

20. Two cows tethered to diagonally opposite vertices of a field formed by joining the mid-points of the adjacent sides of another square field of side $50\sqrt{2}$ m. What is the total grazing area of the two cows?

(a) 1264.5 cm^2 (b) 1664.5 cm^2
(c) 1962.5 cm^2 (d) 1904.5 cm^2

21. Ratio of length and breadth of a rectangular field is 3:2. A 6-metre-wide path is made inside the field along its boundary. If area of the field excluding the path is 288 m^2 , then find the length of the rectangular field.

(a) 24 metres (b) 48 metres
(c) 36 metres (d) 18 metres

22. Length of a rectangle is equal to the perimeter of circle and breadth of the rectangle is equal to the diameter of the circle. If the difference between the area of circle and area of rectangle is 462 cm^2 , then what is the cost of fencing that rectangle if per-unit cost of fencing is Rs.15?

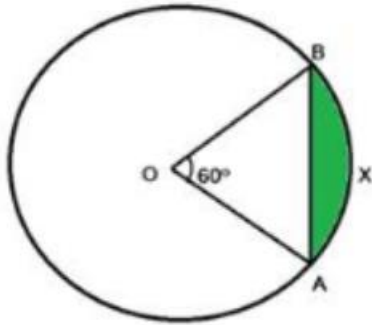
(a) Rs 1520 (b) Rs 1630
(c) Rs 1740 (d) Rs 1850

23. The area of a sector of a circle is 92.4 cm^2 and the central angle of the sector is 150° . Find the diameter of the circle. (Use $\pi = \frac{22}{7}$)

(a) 8.4 cm (b) 14.8 cm
(c) 16.8 cm (d) 21 cm

24. In the given figure, 'O' is the centre of the circle with a diameter of 16 cm, and AB is a chord. Find the

area of the shaded (in green) portion if $\angle AOB = 60^\circ$
(Take $\pi = 3.15$ and $\sqrt{3} = 1.73$)



- (a) 6.48 cm^2 (b) 5.92 cm^2
(c) 7.20 cm^2 (d) 5.44 cm^2
25. A rectangular sheet of breadth 12 cm and perimeter 64 cm is cut from a circular sheet. What is the minimum area of circular sheet?
- (a) $\frac{2992}{7} \text{ cm}^2$ (b) $\frac{2948}{7} \text{ cm}^2$
(c) $\frac{2882}{7} \text{ cm}^2$ (d) $\frac{2926}{7} \text{ cm}^2$
26. In a $\triangle ABC$, the internal bisectors of $\angle B$ and $\angle C$ meet at point O. Find the measure of $\angle BOC$ if the measure of $\angle BAC = 50^\circ$.
- (a) 65° (b) 105°
(c) 75° (d) 115°
27. The sum of three numbers is 80 and the sum of the squares of these three numbers is 2,650. If the product of the three numbers is 13,500 then find the sum of the cubes of the given three numbers.
- (a) 87,860 (b) 1,46,580
(c) 90,750 (d) 1,02,500
28. If $(16x^2 + 81y^2 + 36xy) = (Ax + By - 6 \times \sqrt{x} \times \sqrt{y}) \times (Ax + By + C \times \sqrt{x} \times \sqrt{y})$, then find the value of $A^3 + B^2 + ABC$.
- (a) 53 (b) 48
(c) 57 (d) 55
29. If $(a + b + c) = 14$, $a^2 + b^2 + c^2 = 78$ and $abc = 70$, then find the value of $a^3 + b^3 + c^3$
- (a) 418 (b) 512
(c) 524 (d) 476
30. If $27x^3 - 64y^3 = (Ax - 4y)(9x^2 + By^2 - Cxy)$ then find the value of $4(2A + 3B) + 10C$.
- (a) 80 (b) 96
(c) 5 (d) 64

31. If α and β are the roots of the equation $5x^2 - 2x + 4 = 0$, then find the quadratic equation whose roots are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.
- (a) $2x^2 - 2x + 5 = 0$ (b) $4x^2 + 2x - 5 = 0$
(c) $4x^2 - 2x + 5 = 0$ (d) None of these
32. Solve $|5 - 4x| < -21$
- (a) $x \in (-\infty, -4) \cup (7, \infty)$ (b) $x > \frac{7}{4}$
(c) $\frac{13}{2} > x > \frac{7}{4}$ (d) $x \in (-4) \cup (\frac{7}{4}, \infty)$
33. If $\frac{m+n}{n+p} = \frac{p+q}{q+m}$, then
- (a) m must equal p
(b) $m + p + q + n$ must equal to zero
(c) Both $m = p$ or $m + p + q + n = 0$
(d) None of these
34. If $\frac{6x-7}{x} + \frac{6y-7}{y} + \frac{6z-7}{z} = 0$, then the value of $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ is:
- (a) $\frac{15}{7}$ (b) $\frac{16}{7}$
(c) $\frac{17}{7}$ (d) $\frac{18}{7}$
35. The following question accompanied by three statements numbered (I), (II) and (III). You have to decide whether the data provided in the statements are sufficient to answer the question:
Question: What is the monthly salary of Sonam?
Statement I: Sonam earns Rs 1,500 more than Ajay.
Statement II: The ratio between Ajay's and Vimal's monthly salary is 9: 7.
Statement III: Vimal earns Rs 2,000 less than Sonam.
- (a) Any two of I, II and III are required
(b) Only I and II are required
(c) Only II and III are required
(d) All I, II and III together are required
36. Find the unit digit of the following expression: $257^{253} \times 15^{235} \times 424^{264}$
- (a) 0 (b) 1
(c) 1 (d) 3
37. Find the last 2 digit of the given expression : $198 \times 17373 \times 353 \times 96 \times 127$
- (a) 03 (b) 04

- (c) 13 (d) 14
38. The LCM of two number is 15 times their HCF. The sum of HCF and LCM is 624. If one of the numbers is 135, then the other number is
(a) 164 (b) 165
(c) 169 (d) 171
39. If A, B and C are interior angles of a triangle ABC, then find the value of $\tan\left(\frac{B+C}{2}\right)$?
(a) 0 (b) $\cot \frac{A}{2}$
(c) $\tan \frac{A}{2}$ (d) $\cot A$
40. $\tan 1^\circ \cdot \tan 2^\circ \cdot \tan 3^\circ \cdot \tan 4^\circ \dots \tan 89^\circ$ is equal to?
(a) 0 (b) 1
(c) 2 (d) 3
41. What is the value of $\frac{4\cos^3 48^\circ + \cos 36^\circ}{1 - \cos 84^\circ} - \frac{3}{2} \sec 48^\circ$?
(a) $\frac{\sqrt{3}}{4}$ (b) $\frac{3}{2}$
(c) 2 (d) 0
42. $\cos^2 \Theta \left[\frac{\sin^6 \Theta + \cos^6 \Theta + 3\sin^2 \Theta \cos^2 \Theta}{\sin^2 \Theta + \cot^2 \Theta - 1} \right] + \sec^2 \Theta$ is equal to:
(a) $\tan^2 \Theta + \sec^2 \Theta$ (b) 0
(c) $\tan^2 \Theta$ (d) $\sin^2 \Theta$
43. Simplify the following: $\sin 4x + 2\sin 7x + \sin 10x$
(a) $2\sin 7x(3\sin X - 4\sin^3 X + 1)$
(b) $2\cos 7x(4\cos^3 X - 3\cos X + 1)$
(c) $2\cos 7x(4\sin^3 X - 3\cos X + 1)$
(d) $2\sin 7x(4\cos^3 X - 3\cos X + 1)$
44. If $\sin A = \frac{24}{25}$, what is the value of $\sec A + \tan A$?
Given $0^\circ < A < 90^\circ$.
(a) 7 (b) $\frac{21}{7}$
(c) $\frac{25}{7}$ (d) $\frac{32}{7}$
45. If $2\cos A + \sec A = 2\sqrt{2}$, $0^\circ < A < 90^\circ$, then the value of $2(\sec^4 A + \operatorname{cosec}^4 A)$ is:
(a) 8 (b) 12
(c) 20 (d) 16
46. A person riding a bike, travels a distance of 432 km with speed of K km/hr. After travelling 12.5% of distance, due to some construction work on road which is ahead till 66.66% of remaining distance, its speed reduced by 20%. After covering under construction road distance, there is a traffic jam so it's speed reduced by 16.66% of previous speed and completed the journey with this speed. If he covers the whole distance with an average speed which is 20% more than his initial speed then he takes 6.6 hours less than previous case. Find the initial speed of bike in km/h?
(a) 36 km/h (b) 24 km/h
(c) 50 km/h (d) 30 km/h
47. What is the HCF of $8(x^5 - x^3 + x)$ and $28(x^6 + 1)$?
(a) $4(x^4 - x^2 + 1)$ (b) $2(x^4 - x^2 + 1)$
(c) $(x^4 - x^2 + 1)$ (d) None of these
48. A man invested Rs. 40,000 at in three different parts, each at simple interest. He invested Rs. 12,000 at 12% p.a., Rs. 18,000 at 10% p.a. and rest at r% p.a., each for 1 year. If he earned a total interest of 12.5% p.a., then find the interest the man would earn each year by investing the whole amount at simple interest of r% p.a.
(a) Rs 8240 (b) Rs 7040
(c) Rs 7840 (d) Rs 7000
49. The compound interest earned on investing Rs. 13500 for 2 years at k% p.a., compounded annually is Rs. 5,940. If Rs. 10,500 is invested for 4 years at simple interest of (k-5)% p.a., and Rs. 5,000 is invested for 2 years at compound interest of (k-8)% interest p.a., compounded annually, then what will be the total interest earned from both investments?
(a) Rs 8128 (b) Rs 7248
(c) Rs 7572 (d) Rs 9254
50. Vrushali invested Rs. $(X + 3000)$ on compound interest of r% p.a. compounded annually for 2 years and Tarushi invested Rs. $(X - 2000)$ on simple interest of $(r-2)\%$ p.a. for 3 years. The total interest received by both of them is together Rs. 12360. If Anant invested Rs. $(X + 8000)$ on simple interest for 3 years on 15% and received an interest of Rs. 13500, find the value of 'r':
(a) 10 (b) 18
(c) 12 (d) 15
51. A shopkeeper bought 80 kg of rice at a discount of 5%. Besides 1 kg rice was offered free to him on the purchase of every 20 kg rice. If he sells the rice at the marked price, his profit percentage will be?

- (a) 10.57% (b) $15\frac{3}{7}\%$
(c) 16.33% (d) $14\frac{2}{7}\%$
52. A sold an article to B for Rs. 540 at a loss of 10%. B spent a sum of 100 on its transportation and sold it to C at a price which would have given A profit of 10%. The percentage of gain for B is?
(a) $14\frac{2}{7}\%$ (b) $15\frac{3}{7}\%$
(c) 3.125% (d) 5.625%
53. After giving a discount of Rs 15, a shopkeeper makes a profit of 22%. If that discount is not given then what will be the new profit% if the cost price of the article is Rs 250?
(a) 28% (b) 40%
(c) 18% (d) 32%
54. The total number of cellphones sold for Motorola, Samsung and Sony was 45664. The number of cellphones sold for these companies were in the ratio 3:5:8 respectively. If these data were shown on a pie chart, calculate the angle represented by the number of cellphones sold by Motorola?
(a) 75° (b) 67.5°
(c) 70° (d) 74.5°
55. If GM_1 is the geometric mean of a sequence $\{X\}$, GM_2 is the geometric mean of $\{Y\}$ and GM is the geometric mean of $\{XY\}$, then the relation between the three is?
(a) $GM = GM_1 + GM_2$ (b) $GM = GM_1 \times GM_2$
(c) $GM = \frac{GM_1}{GM_2}$ (d) $GM = GM_1 - GM_2$
56. A frequency distribution table is given below.
- | | | | | | | |
|---|----|---|---|----|----|---|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| f | 26 | p | q | 15 | 10 | 5 |
- If the total frequency is 100 and the mean is 1.7, then what is the value of p and q?
(a) $p = 25$, $q = 19$ (b) $p = 28$, $q = 16$
(c) $p = 30$, $q = 14$ (d) $p = 20$, $q = 24$
57. The data of different natural numbers 4, 5, 9, 11, $2x + 3$, 20, 25, 30, 40 are in ascending order. How many possible values are there for the median of the data for various values of x?
(a) Only 1 possible value (b) Only 2 possible values
(c) 5 possible values (d) 7 possible values
58. Average marks in a subject of a section comprising 30 students is 60 while that of another section comprising 40 students is 65. What is the combined average of both the sections if it was later discovered that an incorrect entry was made for 54 marks as 45 marks?
(a) 62.86 (b) 62.99
(c) 70.11 (d) 62.76
59. The ages of a group of friends are: 22, 25, 29, 31, 35, 36, 38, 40, 41, 42. A new person joins the group, and the median age becomes 36. What is the age of the new person?
(a) 29 years (b) 36 years
(c) 37 years (d) 39 years
60. If the median of the distribution (arranged in ascending order) 1, 3, 5, 7, 9, x, 15, 17, 19, 21 is 10, what is the value of x?
(a) 11 (b) 13
(c) $9 < x < 15$ (d) $9 \leq x \leq 15$
61. In a city 24% of the families speak French, 17% speak Spanish, 66% neither speak French nor Spanish and 1400 families speak both French and Spanish. Then, which of the following statements is/are correct?
1. Percentage of families speaking both French and Spanish is 8%.
2. Total number of families in the city is 40,000.
(a) Only I (b) Only II
(c) Both I and II (d) Neither 1 nor II
62. If $\log_{10} 3 = 0.477$ and $\log_{10} 5 = 0.699$, then how many digits are there in the number $(75)^{20}$?
(a) 37 (b) 38
(c) 39 (d) 40
63. If $\log_{10}(2023) = 3.3$, then find the value of $(0.02023)^{1/5}$.
(a) $10^{0.34}$ (b) $\frac{1}{10^{0.34}}$
(c) $10^{0.17}$ (d) $\frac{1}{10^{0.17}}$
64. The average of 28 numbers is 77. The average of first 14 numbers is 74 and the average of last 15 numbers is 84. If the 14th number is excluded, then what is the average of remaining numbers? (correct to one decimal places)
(a) 74.7 (b) 77
(c) 73.1 (d) 76.9
65. A mixture is made by mixing alcohol and water in the ratio 9: 7. If x litres of alcohol and 3x litres of water is mixed in 80 litres of mixture, the new ratio becomes 13:14. Find the quantity of new mixture?
(a) 88 litres (b) 96 litres
(c) 100 litres (d) 108 litres

66. The mean of a dataset is 15. If one data point with a value of 30 is added to the dataset, what will be the new mean?
- (a) $\frac{(15n+30n)}{(n+1)}$ (b) $\frac{(15n+30)}{(n+1)}$
(c) $n + 1$ (d) $2n + 1$
67. In a certain school, 20% of students are below 8 years of age. The number of students above 8 years of age is $\frac{2}{3}$ of the number of students of 8 years of age which is 48. What is the total number of students in the school?
- (a) 72 (b) 80
(c) 90 (d) 100
68. The price of an article is increased by 37.5%. As a result, a family has decreased its consumption by 20%. The expenditure of the family on that article is effected by?
- (a) 12.5% (b) 33.33%
(c) 10% (d) Data inadequate
69. In a CDS examination a student scored 75% marks and still failed by 15 marks. Another student scored 85% marks and obtained 25 marks more than pass marks. What was the percentage of cutoff marks?
- (a) 80% (b) 80.75%
(c) 78.25% (d) 78.75%
70. Consider the following equations:
1. $\operatorname{cosec}^2 x + \sec^2 x = \operatorname{cosec}^2 x \sec^2 x$
2. $\sec^2 x + \tan^2 x = \sec^2 x \tan^2 x$
3. $\operatorname{cosec}^2 x + \tan^2 x = \cot^2 x + \sec^2 x$
Which of the above statements are correct?
- (a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2 and 3
71. What is the HCF of $a^2b^4 + 2a^2b^2$ and $(ab)^7 - 4a^2b^9$?
- (a) ab (b) a^2b^3
(c) a^2b^2 (d) a^3b^2
72. If $\sin A = \frac{3}{5}$ and $\cos B = \frac{12}{13}$, then the value of $\frac{\tan A - \tan B}{1 + \tan A \tan B}$ is equal to?
- (a) $\frac{23}{16}$ (b) $\frac{16}{63}$
(c) $\frac{1}{63}$ (d) $\frac{13}{63}$
73. The angle of depression of two ships from the top of a light house are 45° and 30° towards East. If the ships are 200 m apart, the height of the light house is?
- (a) $200(\sqrt{3} + 1)$ (b) $100(\sqrt{3} + 1)$
(c) $100(\sqrt{3} - 1)$ (d) $200(\sqrt{3} - 1)$
74. If $\tan 60^\circ + \cos 45^\circ = \sec 45^\circ$ then the value of $(x^2 + 1)$ is?
- (a) $\frac{6}{7}$ (b) $\frac{7}{6}$
(c) $\frac{5}{6}$ (d) $\frac{6}{5}$
75. Two pipes X and Y can fill a tank in 56 min. and 16 min. respectively. There is also a waste pipe in the tank. When all the three are opened, the cistern get filled in $22\frac{2}{5}$ minutes. How long will the waste pipe take to empty the full tank?
- (a) 30 minutes (b) 28 minutes
(c) 25 minutes (d) None of these
76. A tank is filled in 6 hours by three pipes P, Q and R. Pipe P is 12 times as fast as pipe R and 4 times as fast as pipe Q. How many hours will pipes Q and R take to fill the tank?
- (a) 22 (b) 17
(c) 18 (d) 24
77. 3 men and 8 women can complete a work in $\frac{75}{8}$ days, while 9 men and 12 women can complete it in 2 days. In how many days will 15 women complete it?
- (a) 18 (b) 24
(c) 20 (d) 22
78. If one of the roots of the equation $x^2 - bx + c = 0$ is the square of the other, then which one of the following is correct?
- (a) $b^3 = 3bc + c^2 + c$ (b) $c^3 = 3bc + b^2 + b$
(c) $3bc = c^3 + b^2 + c$ (d) $3bc = c^3 + b^3 + b^2$
79. If α and β are the roots of the equation $x^2 + 2px - q = 0$ then $-\alpha^{-1}$, $-\beta^{-1}$ are the roots of which one of the following equations?
- (a) $qx^2 + 2px - 1 = 0$ (b) $qx^2 + 2px + 1 = 0$
(c) $x^2 + px - 2q = 0$ (d) $2x^2 - px + q = 0$
80. If $\frac{5}{x+y} + \frac{2}{x-y} = 3$ and $\frac{7}{x+y} - \frac{3}{x-y} = 4$ then what is $\frac{x}{y}$ equal to?
- (a) $-\frac{29}{34}$ (b) $-\frac{29}{27}$
(c) $-\frac{29}{37}$ (d) $-\frac{27}{29}$
81. If $\left[\frac{a^2}{4} + \frac{b^2}{4} + \frac{c^2}{4} \right] = \left(\frac{a}{2} + \frac{b}{2} + \frac{c}{2} \right)^2$, then what is the relation between a, b & c?

- (a) $a = b \neq c$ (b) $a \neq b = c$
(c) $a \neq b \neq c$ (d) $a = b = c$
82. If $ab - bc + ac = 0$, then value of $\frac{1}{b^2 + ac} + \frac{1}{c^2 + ab} - \frac{1}{bc - a^2}$ is
(a) 1 (b) 0
(c) 2 (d) Undefined
83. If $p(x + y)^2 = 13$ & $q(x - y)^2 = 19$, then simplified value of $p^2(x + y)^2 + 4xy \times pq + q^2(x - y)^2$ is
(a) $2(16q - 3p)$ (b) $16q - 3p$
(c) $2(3q - 16p)$ (d) $3q - 16p$
84. If $a + \frac{1}{a} = 5$, then $\frac{49a^2 + 48a + 49}{a^2 + a + 1} =$
(a) $\frac{297}{7}$ (b) $\frac{297}{6}$
(c) $\frac{293}{6}$ (d) $\frac{293}{7}$
85. Ten chairs and six tables together cost ₹6,200; three chairs and two tables together cost ₹1,900. The cost of 4 chairs and 5 tables is
(a) ₹3,000 (b) ₹3,300
(c) ₹3,500 (d) ₹8,800
86. If $x : y = 7 : 5$, then what is $(5x - 2y) : (3x + 2y)$ equal to?
(a) $5/4$ (b) $6/5$
(c) $25/31$ (d) $31/42$
87. A person P started a business with a capital of Rs. 2,525 and another person Q joined P after some months with a capital of Rs. 1,200. Out of the total annual profit of Rs. 1,644, P's share was Rs. 1,212. When did Q join as partner?
(a) After 2 months (b) After 3 months
(c) After 4 months (d) After 5 months
88. Ravi's brother is 3 years elder to him. His father was 28 years of age when his sister was born while his mother was 26 years of age when he was born. If his sister was 4 years of age when his brother was born, the ages of Ravi's father and mother respectively when his brother was born were
(a) 32 years and 23 years
(b) 32 years and 29 years
(c) 35 years and 29 years
(d) 35 years and 33 years
89. Find the unit digit of the number $\frac{(57^{103} + 83^{57})}{6}$.
(a) -2 (b) 0
(c) 2 (d) 7
90. If a number 537XY is exactly divisible by 90, then what is the value of $(X + Y)$?
(a) 8 (b) 5
(c) 9 (d) 3
91. In a two digit positive number the unit digit is equal to the square of ten's place digit. The difference between the original number and the number formed by interchanging the digit is 54. What of 40% of the original number?
(a) 14.8 (b) 16.5
(c) 15.6 (d) 17.8
92. If $k, (k + 2), (k + 4)$ are prime numbers, then the number of possible solutions for k is.
(a) 2 (b) 1
(c) 3 (d) None
93. The maximum daily temperature (in °C) of a city on 7 consecutive days is 33.5, 29.3, 25.7, 24.2, 38.1, 34.3, and 31.9. The range of the given data is?
(a) 10.1°C (b) 13.9°C
(c) 7.8°C (d) 12.4°C
94. Consider the following statements in respect of two chords X Y and Z T of a circle intersecting at P:
1. $PX \cdot PY = PZ \cdot PT$
2. PXZ and PTY are similar triangles.
Which of the above statements is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
95. Consider the following statements:
1. If the diagonals of a parallelogram A B C D are perpendicular, then A B C D may be a rhombus.
2. If the diagonals of a quadrilateral A B C D are equal and perpendicular, then ABCD is a square.
Which of the statements given above is/are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
96. Consider the following statements:
1. Let P be a point on a straight line L. Let Q, R, S be the points on the same plane containing the line L such that PQ, PR, P S are perpendicular to L. Then there exists no triangle with vertices Q, R, S.

2. Let C be a circle passing through three distinct points D, E, F such that the tangent at D to the circle C is parallel to EF . Then DEF is an isosceles triangle. Which of the statements given above is/are correct?
- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
97. The two adjacent sides of a cyclic quadrilateral are 2 cm and 5 cm and the angle between them is 60° . If the third side is 3 cm, then the fourth side is of length
- (a) 2 cm (b) 3 cm
(c) 4 cm (d) 5 cm
98. Consider the following statements:
1. Congruent triangles are similar.
 2. Similar triangles are congruent.
 3. If the hypotenuse and a side of one right triangle are equal to the hypotenuse and a side of another right triangle respectively, then the two right triangles are congruent.
- Which of the statements given above is/are correct?
- (a) 1 only (b) 2 only
(c) 2 and 3 only (d) 1 and 3 only
99. The side BC of a triangle ABC is produced to D ; bisectors of the angles ABC and ACD meet at P . If $\angle BPC = x^\circ$ and $\angle BAC = y^\circ$, then which one of the following is correct?
- (a) $x^\circ = 2y^\circ$ (b) $2x^\circ = 3y^\circ$
(c) $x^\circ = y^\circ$ (d) $2x^\circ = y^\circ$
100. In a three-digit number, the digit in the unit's place is four times the digit in the hundreds place. If the digit in the unit's place and the ten's places are interchanged, the new number so formed is 18 more than the original number. If the digit in the hundred's place is one third of the digit in the ten's place, then what is 25% of the original number?
- (a) 67 (b) 84
(c) 137 (d) 124

ANSWER KEY

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

