CBSEASSISTANCE.COM

General Instructions:

1. All questions are compulsory.
2. The question paper consists of 31 questions divided into four sections A, B, C and D. Section – A comprises of 4 questions of 1 mark each; Section – B comprises of 6 questions of 2 marks each; Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 11 questions of 4 marks each.
3. There is no overall choice in this question paper.
4. Use of calculator is not permitted.

SECTION – A

Question numbers 1 to 4 carry one mark each.

1. A ladder 10 m long reaches a window 6 m above the ground. Find the distance of the foot of the ladder from the base of the wall.
2. If $\tan \theta = \sqrt{3}$, find the value of $\sin \theta . \cos \theta$
3. Find the value of $\dfrac{1}{\sin 30^0} - \dfrac{\sqrt{3}}{\cos 30^0}$
4. If class marks of a distribution are 10, 20, 30, 40, ... , find first and fifth class intervals.

SECTION – B

Question numbers 5 to 10 carry two marks each.

5. Find whether decimal expansion of $\dfrac{13}{64}$ is a terminating or non – terminating decimal. If it terminates, find the number of decimal places its decimal expansion has.
6. Complete the following factor tree and find the composite number x.
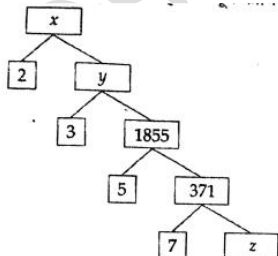
7. If $x + a$ is a zero of the polynomial $2x^2 + 3ax + 1$, find the value of a.
8. D and E are points on sides AB and AC of a ΔABC such that AD = 1 cm, DB = 3 cm, AE = 2 cm and EC = 6 cm, then find whether DE ‖ BC.
9. If $x = p \sec \theta + q \tan \theta$ and $y = p \tan \theta + q \sec \theta$, then prove that $x^2 - y^2 = a^2 - b^2$
10. Data regarding weights of students of class X of a school is given below. Calculate the average (mean) weight of students.

Weight (in kg)	50 – 52	52 – 54	54 – 56	56 – 58	58 – 60	60 – 62	62 – 64
Number of students	18	21	17	28	16	35	15

SECTION – C

Question numbers 11 to 20 carry three marks each.

11. Show that $\frac{7\sqrt{11}}{3}$ is an irrational number.

12. Solve for x and y: $\frac{x}{2} + \frac{2y}{3} = -1; x - \frac{y}{3} = 3$

13. If one zero of the polynomial $(a + 2)x^2 + 6x + 5a$ is reciprocal of the other, then find the value of a.

14. Determine graphically whether the following pair of linear equations
    $2x - 3y = 8; 4x - 6y = 16$ has:
    i.   a unique solution
    ii. infinitely many solutions or
    iii. no solution

15. In ΔABC, perpendicular drawn from A intersects BC at D such that 3 DB = CD. Prove that $2AB^2 = 2AC^2 - BC^2$.

16. In a right angled ΔABC, $\angle B = 90^0$. If $\frac{AB}{AC} = \frac{1}{\sqrt{2}}$, find $\frac{BC}{AC}$

17. If $15 \sin \theta = 8 \cos \theta$, then find the value of: $\frac{1 + \sin \theta}{1 - \cos \theta} . \cot \theta$

18. If $x = a \sin \theta$ and $y = b \tan \theta$, then show that $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 1$

19. In a certain city, traffic police gave following distribution showing number of victims in accidents in a year and their ages:

Age of victims (in years)	0 – 15	15 – 30	30 – 45	45 – 60	60 – 75	75 – 90
Number of victims	15	35	40	20	8	2

Draw a 'more than type' ogive for the data.

20. Find the mean and median for the following data:

| Class	0 – 4	4 – 8	8 – 12	12 – 16	16 – 20
Frequency	3	5	9	5	3

SECTION – D

Question numbers 21 to 31 carry four marks each.

21. Rita, Krish and Zara start solving a puzzle together. They took 12, 18 and 21 minutes respectively to solve the puzzle. After how much time will they start solving a new puzzle together?

22. Jhanavi wants to make a rectangular park for children and others to play. The area of the park remains unchanged if its length is increased by 7 m and breadth is decreased by 3 m unit. Its area remains unaffected if the length is decreased by 7 m and breadth is increased by 5 m. Find the dimensions of the park.
    Why did Jhanavi decide to make a park?

23. Divide the polynomial $x^4 + 7x^3 + 7x^2 - 30x - 55$ by $x + 4$ and find the quotient and remainder. Also verify the division algorithm.

24. Two years ago, a father was five times old as his son. Two years later from today his age will be 8 years more than three times the age of his son. Find their present ages.

25. Prove that the ratio of areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

26. In an equilateral $\triangle ABC$, E is any point on BC such that $BE = \frac{1}{4} BC$. Prove that $16\,AE^2 = 13\,AB^2$.

27. Prove that: $2(\sin^6 A + \cos^6 A) - 3(\sin^4 A + \cos^4 A) + 1 = 0$

28. In $\triangle ABC$(see figure), $\angle C = 90^0$, $AB = x$ units and $AC = 3$ units.
    Evaluate: $x \cos B. \tan A + x^2 \sin A. \sec B + \sin C$
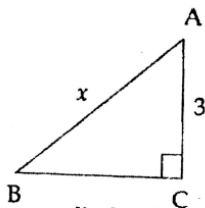
29. If $x = \operatorname{cosec} A + \cos A$ and $y = \operatorname{cosec} A - \cos A$, then prove that:
    $$\left(\frac{2}{x+y}\right)^2 + \left(\frac{x-y}{2}\right)^2 - 1 = 0$$

30. Following frequency distribution shows the monthly expenditure incurred by some families in housing society:

Expenditure (in Rs.)	5000 – 6000	6000 – 7000	7000 – 8000	8000 – 9000	9000 – 10000	10000 – 11000	11000 – 12000
Number of families	4	8	9	20	13	7	1

Draw a 'less than type' ogive and a 'more than type' ogive. From these two curves, find the median.

31. In a certain locality, monthly consumptions of electricity (in units) of 122 families are given in the following table. If mode is given to be 139, find the missing frequencies x and y.

Electricity consumed (in units)	70 – 90	90 – 110	110 – 130	130 – 150	150 – 170	170 – 190	190 – 210	210 – 230
Number of families	x	10	y	40	18	9	8	3