CBSE Sample Paper for Class 11 Maths

Max. Marks: 80
Time: 3 hours

Section A – All Questions Carry 1 Mark Each

1. Find the multiplicative inverse for √5 - 6i.
2. If A = {2,3, 4}, then what is P(A) ?
3. Give the contrapositive of the following statement: If it rains, then they cancel school.
4. Write the condition on a and b such that AM, GM and HM of a and b are equal.
5. Can you justify why √4 = 2 but √x² = |x| (where |x| is modulus operator.
6. If A = {x: x is the positive number divisible by 5 and less than 20} then write the cardinally of set A.
7. Write the sample space when two coins are tossed.
8. What is the value of the slope of a line which is parallel to the y-axis?

Section B – All Questions Carry 4 Marks Each

1. When two events are called 'Mutually Exclusive' events? Represent two mutually exclusive sets A and B on a Venn diagram. What were these sets called in set theory parlance.
2. Write the simplified form for the given Sine series.
   Sin(A) + Sin(A+d) + Sin(A+2d) + ... + Sin(A + (n - 1)d = ___
   Give the proof for above equation:
3. Plot the graph of quadratic polynomial, y = x^2 - 2x + 1 and represent the solution for same.
4. If x^2 - bx + 4 = 0 has two real roots and vertex lies on right side of y-axis. Then find the minimum integral value of b to satisfy the above condition.
5. Find 4 and 4 if $x, y \in R$ and $(4 + 5i)x + (3 - 2i)y + i^2 + 6i = 0.$
6. A circle has its centre at (2, 3) and a point on the circle is the intersection of the lines $3x - 2y - 1 = 0$ and $4x + y - 27 = 0.$ Find the equation of this circle.

7. In the expansion of $(1+x)^n$, the ratio of the coefficients of three consecutive terms is 1 : 3 : 5. Find n and the order of the three terms.
8. Find the sum of the sequence a_n = 5n + 4 for first 15 terms.
9. If first term of a Harmonic progression is 1 and third term is 9. Then find the 15th term of the same progression.
10. Prove that number of ways of selecting 3 members from 10 members is equal to number of ways of selecting 7 members from 10 members.
11. Find whether the points A(-2,3,5), B (1,2,3) and C(7,0,1) are collinear using: Distance formula and Section formula
12. The vertices of a tetrahedron are A(-2,3,4), B(3,-4,2) , C(2,-5,2) and D(a,b,c) .The centroid of the tetrahedron is (0, -1, 5/2). Find the value of a + b - c.

Section C – All Questions Carry 6 Marks Each

1. Let $\cos(\alpha) = -\frac{1}{4}$ and $-\pi < \alpha < -\frac{\pi}{2}$. . Use the information to find the value of $\sin\left(\frac{\alpha}{2}\right), \cos\left(\frac{\alpha}{2}\right)$ and $\tan\left(\frac{\alpha}{2}\right)$

2. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these
   a. four cards are of same suit.
   b. cards are of same colour.
   c. two are red cards and two are black cards.
   d. cards are of black colour.

3. Find the solution graphically for the following system of inequalities:

$$x \geq 0$$
$$4x + 5y \geq 20$$
$$2x + y \leq 8$$

4. Solve the following:

a) What are harmonic conjugates?
b) Calculate the ratio in which P(2,3,4) divides the line joining of A(3,-2,2), B (6, -17, -4).
c) Write the harmonic conjugate of point P in (b).