ISC Class 11 Maths Important Questions

1. If A = {1, 2, 3, 4, 5, 6,} B = {2, 4, 5, 6, 8, 9, 10}, find A Δ B.

2. Let A = {2, 4, 6, 8} B = {1, 2, 3, 4) and
   R = {(a, b) : a ϵ A, b ϵ B, a is divisible by b}. Write Relation R in set builder form.

3. Prove that:
   $$\frac{Cos\ 2A}{1+Sin2A} = Tan\left(\frac{\pi}{4} - A\right)$$

4. In a Δ ABC, prove that
   $$\frac{Sin\ A}{Sin(A+B)} = \frac{a}{c}$$

5. If $\frac{2+3i}{3-4i} = a + ib$, find the values of a and b.

6. If α and β are the roots of the equation $px^2 + qx + 1 = 0$, find $\alpha^2\beta + \beta^2\alpha$.

7. In how many ways can 12 books be arranged on a shelf if:
   (a) 4 particular books must always be together.
   (b) 2 particular books must occupy the first position and the last position.

8. An urn contains 60 blue pens and 40 red pens. Half of the pens of each one is defective. If one pen is chosen at random, what is the probability that it is a defective or a red pen?

9. Find the domain and range of : 2 – |x − 4|

10. Prove that $\frac{\cos A + \cos 3A + \cos 5A + \cos 7A}{\sin A + \sin 3A + \sin 5A + \sin 7A} = \cot 4A$

11. Using Mathematical induction, prove that $10^n + 3 \cdot 4^{n+2} + 5$ is divisible by 9 for an nϵN.

12. If z = x + iy and |2z − 1| = |z + 2i|, find the locus of z and represent it in the argand diagram.

13. A Committee of 6 members has to be formed from 8 boys and 5 girls. In how many ways can this be done if the Committee consists of :
    i. Exactly 3 girls
    ii. At least 3 girls

14. How many different words can be formed of the letter of word "GRANDMOTHER", so that:
    i. The word starts with G and end with R.
    ii. The letters A, N, D are always together.
    iii. All vowels never come together.

15. Find the equation of acute angled bisector of lines: $3x - 4y + 7 = 0$ and $12x - 5y - 8 = 0$

16. Find the equation of the circle which passes through the points (2, 3), (4, 5) and the center lies on the line $y - 4x + 3 = 0$.

17. Differentiate the function Sin $(2x - 3)$ by First Principle of differentiation.

18. The sum of three consecutive numbers of a G.P is 56. If we subtract 1, 7 and 21 from these numbers in the order, the resulting numbers form an A.P., find the numbers.
19. Find the mean, standard derivation for the following data:

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency	2	3	5	10	3	5	2

20. Find the co-ordinates of a point on the parabola $y^2=8x$, whose focal desistance is 4.

21. Prove that:

    $\sim(P \Rightarrow q) = P \wedge (\sim q)$

22. Write Converse and inverse of the given conditional statement: If a number n is even, then n^2 is even.

23. Find the center, focus, eccentricity and latus rectrum of the hyperbola $16x^2 - 9y^2 = 144$.

24. In what ratio the point P(–2, y, z) divides the line joining the points A(2, 4, 3) and B(–4, 5, –6). Also, find the coordinates of point P.

25. If the origin is the centroid of the triangle with vertices (–4, 2, 6) (2a, 3b, 2c) and (8, 14, –10) find the values of a, b and c.