**SAMPLE PAPER-2013**

**CLASS-XI**

**Subject:-Mathematics**

*Time allowed : 3 hours Maximum Marks: 100*

**General Instruction: As Per CBSE Sample Paper. Section (A)**

1. Write the set {2, 4, 8, 16, 32} in the set builder form.
2. Write down the power set of { }.
3. Find the radian measure of 2400.
4. If sec x = 13/5, find the quadrant in which x can lie.
5. Find the value of cosec ( - 14100).
6. Find the multiplicative inverse of 2 – 3i.
7. Convert 7 x 8 x 9 x 10 in factorial form.
8. Give an example of a sequence which is not a progression.
9. Does the point ( - 2.5 , 3.5) lie inside, outside or on the circle x2 + y2 = 25?
10. Reduce the equation $\sqrt{3} $x + y – 8 = 0 into normal form. **Section – B**
11. Find the set A, B and C such that $A∩B, B∩C \& C∩A$ are not empty set but $A∩B∩C=∅$.
12. Define a relation R on the set N of natural numbers by R = { (x, y): y = x + 5 , x ,y $ϵN, x<4\}$. Draw an arrow diagram of R. depict this relationship using roaster form. Write down the domain and range of R.
13. Find the domain and range of real function f(x) = $\sqrt{9-x^{2}}$**.**
14. Prove that cos4x = 1 – 8sin2xcos2x.
15. Find the general solution of the equation sin 2x + cos x = 0. **Or**  In any triangle ABC, the angles are in the ratio 1:2:3. Prove that the corresponding sides are in the ratio of 1 : $\sqrt{3}$ : 2.
16. Convert the complex number ( - 1 + i) in the polar form.
17. If (x+ iy)3 = u + iv, then show that $\frac{u}{x}+\frac{v}{y}=4(x^{2}-y^{2})$ **Or**  Find the square root of (- 15 + 8i).
18. Find the number of arrangements of the letter of the word INDEPENDENCE. In how many of these arrangements, do the words begin with I and end with P. **Or**  Find the number of 4 digits numbers that can be formed using the digits 1, 2, 3, 4, 5 if no digit is repeated. How many of these will be even.
19. In an examinationa question paper consists of 12 questions divided into two parts i.e. in Part I and in Part II, containing 5 and 7 questions respectively. A student is required to attempt 8 questions in all, selecting at least 3 from each part. In how many ways can a student select the questions?
20. If the 4th, 7th and 10th term of a G.P. are x, y and z respectively prove that x, y and z are also in G.P.
21. If P is the length of the perpendicular form the origin to the line whose intercepts on the axes are ‘a’ and ‘b’ then show that $\frac{1}{p^{2}}=\frac{1}{a^{2}}+\frac{1}{b^{2}}$.  **Or** What are the points on y – axis whose distance from the line 4x + 3y = 12 is 4 units.
22. Find the ratio in which YZ plane divides the line segment joining the points ( -2, 4, 7) and (3, -5, 8). **Section – C**
23. in a survey of 25 students, it was found that 15 had taken Mathematics, 12 had taken Physics and 11 had taken Chemistry, 5 had taken both maths and chemistry, 9 had taken maths and physics, 4 had taken physics and chemistry and 3 had taken all the three subjects. Find the number of students that had taken (1) only chemistry (2) Physics and chemistry but not maths.
24. Find sin $\frac{x}{2} ,\cos(\frac{x}{2} and tan\frac{x}{2})$ if tan x = $-\frac{4}{3}$ , it is known that x lies in II quadrant.
25. Using the principal of mathematical induction prove that 10­2n-1 +1 is divisible by 11.
26. Solve the following system of inequalities graphically: x + 2y $\leq 8$, 2x + y$\leq 8$ .
27. The coefficients of (r-1)th , rth and (r+1)th terms in the expansion of (x + 1 )n are in the ratio 1 : 3 : 5, find ‘n’ and ‘r’. **Or**  Find a , b and n in the expansion of (a + b)n if the first three terms of the expansion are 729, 7290 and 30375 respectively.
28. In an AP if pth term is 1/q, qth term is 1/p, prove that the sum of its first pq terms is $\frac{1}{2}(pq+1)$, where p $\ne q$  **Or**  Find the sum to n terms of the series 12 + (12 +22) + (12 + 22 + 32)+…
29. Find the coordinates of foci, vertices, the length of major and minor axes and the eccentricity of the ellipse 9x2 + 4y2 = 36