Std:- XI

Sub: - Mathematics **Practice Paper** **Time:- 1 1/2 Hours**
Marks:- 50

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General Instruction :

1. All questions are compulsory.
2. The question paper consists of 14 questions divided into three sections A, B and C. **Section A** comprises of 4 questions of **one mark** each. **Section B** comprises of 7 questions of **four marks** each and **Section C** comprise of 3 questions of **six marks** each.
3. Use of calculators is not permitted.

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SECTION 'A'

1. Find the number of non empty subsets of the set { 1, 2, 3, 4 }
2. A wheel makes 180 revolutions per minute. Through how many radians does it turn in 1 second?
3. Solve $|4x-3|<27$
4. Write the general solution of $\sin^2 2\theta = 0$

SECTION 'B'

5. Prove that $5^{2n}-1$ is divisible by 24, using principle of mathematical induction for all n Є N
6. Prove by using principle of mathematical induction
   $\left(1+\frac{1}{1}\right)\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)....\left(1+\frac{1}{n}\right)=n+1$ for all n Є N
7. Prove that $\cos 20°\cos 30°\cos 40°\cos 80° = \frac{\sqrt{3}}{16}$
8. Show that $\sqrt{2+\sqrt{2+\sqrt{2+2\cos 8\theta}}} = 2\cos\theta$

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9. Let $U=\{1,2,3,4,5,6,7,8,9,10\}, A=\{1,2,3,4\}, B=\{2,4,6,8,10\}, C=\{3,4,5,6\}$
   i) Find $(B-C)^c$

ii) Verify that $(A \cap B)^c = A^c \cup B^c$

10. Using properties of sets prove that

i) $A \cup (A \cap B) = A$ ii) $A \cap (A \cup B) = A$

11. The cost and revenue functions of the product are given by $C(x) = 2x + 400$ and $R(x) = 6x + 20$ respectively, where x is the number of items produces by the manufacturer. How many items the manufacturer must sell to realize some profit?

SECTION 'C'

12. In a town of 10,000 families , it was found that 40% families buys newspaper A, 20% families buy newspaper B, and 10% families buy newspaper C, 5% buy newspaper A & B, 3% buy newspaper B & C and 4% buy newspaper A & C .If 2% families buy all three newspapers, then find the number of families which buy newspaper

i) A only, ii) at least one of the three papers, iii) none of A, B & C.

13. Solve: $x + 2y \le 3, 3x + 4y \ge 12, x \ge 0, y \ge 1$ graphically.

14. In any triangle ΔABC, prove that: $(b^2 - c^2)\cot A + (c^2 - a^2)\cot B + (a^2 - b^2)\cot C = 0$