SWOT INSTITUTE
1st to 8 Chapters
XI-TEST

Time : 1 ½ hr. **M.M: 50**

Q.No. 1 to 3 are 6 Marks

1. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical C_1, 50 to chemical C_2, and 30 to both the chemicals C_1 and C_2. Find the number of individuals exposed to
   (i) Chemical C_1 but not chemical C_2
   (ii) Chemical C_2 but not chemical C_1
   (iii) Chemical C_1 and chemical C_2.
2. In how many ways can the letters of the word PERMUTATIONS be arranged if the
   (i) words start with P and end with S,
   (ii) vowels are all together,
   (iii) there are always 4 letters between P and S ?
3. Find the term independent of x in the expansion of $\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^6$.

Q.No. 4 to 9 are 4 Marks

4. If $(x + iy)^3 = u + iv$, then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$
5. Find the middle terms in the expansion of
   $\left(3 - \frac{x^3}{6}\right)^7$
6. If $f(x) = x^2$, find $\frac{f(1.1) - f(1)}{(1.1 - 1)}$
7. A manufacturer has 600 litres of a 12% solution of acid. How many litres of a 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18% ?
8. $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + ... + \frac{1}{2^n} = 1 - \frac{1}{2^n}$.
9. Show that : $\tan 3x \tan 2x \tan x = \tan 3x - \tan 2x - \tan x$.

Q.No. 10 to 13 are 2 Marks

10. The minute hand of a watch is 1.5 cm long. How far does its tips move in 40 minutes ? (Use $\pi = 3.14$)
11. Prove that : $\frac{\cos 7x + \cos 5x}{\sin 7x - \sin 5x} = \cot x$.
12. If $\left(\frac{x}{3} + 1, y - \frac{2}{3}\right) = \left(\frac{5}{3}, \frac{1}{3}\right)$, find the value of x and y.

Q.No. 14 to 30 are 1 Mark

13. Solve inequalities and represent the solution graphically on number line.

    $5(2x - 7) - 3(2x + 3) \le 0$, $2x + 19 \le 6x + 47$.

14. Let A = {1, 2} and B = {3, 4}. Write $A \times B$. How many subsets will $A \times B$ have ? List them.