1. If $nC_2 = nC_8$, find nC_3.   (Ans. 120)

2. Find the general term in the expansion of $\left(x - y^2\right)^7$

3. How many two-digit numbers are there in which both the digits are distinct?   (Ans. 81)

4. Evaluate: C (20, 13) + C (20,14) – C (20, 6) – C (20, 7)   (Ans. 0)

5. Find 5th term from the end in the expansion of $(2x - 3y)^9$

6. Find r if C (8, r) – C (7, 3) = C (7, 2)   (Ans. 3 or 5)

7. Expand and simplify: $\left(\sqrt{2} + 1\right)^5 + \left(\sqrt{2} - 1\right)^5$.

8. Does the expansion of $\left(2x^2 - \frac{1}{x}\right)^{20}$ contain any term involving x^{-1}? Why?   (Ans: No).

9. Find the value of a for which the coefficients of the middle terms in the expansion of
    $(1 + ax)^4$ and $(1 - ax))^6$ are equal, find a.   (Ans: $-\frac{3}{10}$)

10. If all the words formed using the letters of the word 'LIMIT' are arranged in the dictionary order, what will be rank of the word 'TIIML'

11. A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has (i) Atleast one boy and one girl? (ii) Atmost 2 boys

12. A polygon has 44 diagonals. Find the number of sides of the polygon.   (Ans: 11)

13. Find the term independent of x in the expansion of $\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^{12}$

14. Find the real value(s) of p if the coefficient of the middle term in the expansion of $\left(\sqrt{x} + \frac{p}{x^2}\right)^8$ is 70.

    (Ans:± 1)

15. Using Binomial theorem prove that 6^n- 5n always leaves remainder 1 when divided by 25 for all positive integers n

16. Find the relationship between a and b if coefficients of x^7 in
    $\left(ax^2 + \frac{1}{bx}\right)^{11}$ and coefficients of x^{-7} in $\left(ax + \frac{1}{bx^2}\right)^{11}$ are equal.

17. If $(n-1)C_r : nC_r : (n+1)C_r = 6:9:13$, find n and r.   (Ans: n=12, r= 4)

18. Find the number of different words which can be formed by using all the letters of the word *STATISTICS.*
    i) In how many of them the vowels are together?
    ii) If all the distinct arrangement of the letters of the word STATISTICS are listed as in the dictionary, how many words are there in the list before the first word start with I?
    (Ans: $\frac{10!}{3! \ 3!2!}, \frac{9!}{3!3!}, \frac{9!}{3!3!}$)

19. i) Find the coefficient of $\frac{1}{y^2}$ $in \ the \ expansion \ of$ $\left(y + \frac{1}{y^2}\right)^{10}$ (Ans: $10 \ C_4$)

    ii) Find the middle term(s) in the expansion of $\left(2x - \frac{x^2}{3}\right)^{11}$. (Hint: 6th and 7th term)

20. The second, third and fourth terms in the expansion of $(x + a)^n$ are 240, 720 and 1080 respectively. Find x, a and n.   (Ans: n=5, x=2 and a= 3).
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