ezyEXAMSolution

# JEE MAINS PATTERN

## Mathematics : Binomial Theorem

## Practice Paper – 02

1. The number of terms in the expansion of $(x + y + z)^n$ is

(A) $\frac{n(n+1)}{2}$ (B) $\frac{(n+1)(n+2)}{2!}$ (C) $\frac{n(n+3)}{2}$ (D) $\frac{(n+1)(n+3)}{2}$

2. If 'n' is a positive integer, $\sum_{r=0}^{n}\left({}^{n}C_{r}\right)^{2} =$

(A) 0 (B) ${}^{n}C_{n/2}$ (C) $\frac{(2n)!}{n!}$ (D) $\frac{(2n)!}{(n!)^2}$

3. The coefficient of $a^4b^3c^2d$ in the expansion of $(a - b + c - d)^{10}$ is

(A) 12600 (B) 16200 (C) 21600 (D) 26100

4. If $n \geq 2$ then $3.C_1 - 4.C_2 + 5.C_3 - ..... + (-1)^{n-1}(n+2).C_n =$

(A) –1 (B) 2 (C) –2 (D) 1

5. $2.C_0 + 2^2\frac{C_1}{2} + 2^3.\frac{C_2}{3} + ..... + 2^{n+1}.\frac{C_n}{n+1} =$

(A) $\frac{3^{n+1}-1}{2(n+1)}$ (B) $\frac{3^{n+1}-1}{n+1}$ (C) $\frac{3^n-1}{n+1}$ (D) $\frac{3^n+1}{n+1}$

6. $C_1 + 2C_2.a + 3.C_3.a^2 + ..... + 2n.C_{2n}a^{2n-1} =$

(A) $n(1 + a)^{n-1}$ (B) $n(1 + a)^n$ (C) $2n(1 + a)^{2n-1}$ (D) $2n(1 + a)^{2n}$

7. If the sum of the coefficients in the expansion of $(x + y)^n$ is 4096, then the greatest coefficient is

(A) ${}^{11}C_5$ (B) ${}^{12}C_5$ (C) ${}^{12}C_6$ (D) ${}^{14}C_7$

8. The coefficients of $9^{th}$, $10^{th}$ and $11^{th}$ terms in the expansion $(1 + x)^n$ are in A. P., then n=

(A) 7 (B) 7 or 14 (C) 14 (D) 21

9. If $(1 + x - 2x^2)^6 = \sum_{r=0}^{12} a_r.x^r$ , then $a_2 + a_4 + \ldots. + a_{12} =$

(A) 64 (B) 63 (C) 32 (D) 31

10. $^{2n}C_2 + {}^{2n}C_4 + \ldots.. + {}^{2n}C_{2n} =$

(A) $2^{2n}$ (B) $2^{2n} - 1$ (C) $2^{2n-1}$ (D) $2^{2n-1} - 1$

11. $\frac{C_1}{C_o} + 2\frac{C_2}{C_1} + 3\frac{C_3}{C_2} + \ldots.... + n\frac{C_n}{C_{n-1}} =$

(A) $\frac{(n+1)(n+2)}{2}$ (B) $\frac{n(n+1)}{2}$ (C) $\frac{n(n-1)}{2}$ (D) $\frac{n(n+2)}{2}$

12. $C_o + 3.C_1 + 5.C_2 + \ldots. + (2n+1).C_n =$

(A) $(n + 1)2^n$ (B) $(2n + 1)2^{n-1}$ (C) $(2n + 1)2^n$ (D) $(n + 1)2^{n-1}$

13. $\frac{(C_0 + C_1)(C_1 + C_2)(C_2 + C_3)\ldots....(C_{n-1} + C_n)}{C_oC_1C_2\ldots...C_n}$

(A) $\frac{(n+1)^n}{n}$ (B) $\frac{(n+1)}{\lfloor n}$ (C) $\frac{(n+1)^{n-1}}{\lfloor n}$ (D) $\frac{(n+1)^n}{\lfloor n}$

14. $\sum_{r=2}^{n}(5r-3)C_r =$

(A) $(5n+6)2^{n-1} - 2n + 2$ (B) $(5n+6)2^{n-1} - 2n + 3$

(C) $(5n-6)2^{n-1} - 2n + 2$ (D) $(5n-6)2^{n-1} - 2n + 3$

15. If $C_o + C_1 + C_2 + \ldots.. + C_n = 128$ then

$C_o - \frac{C_1}{2} + \frac{C_2}{3} - \frac{C_3}{4} + \ldots.. =$

(A) 0 (B) 8 (C) 1/8 (D) 7/8

16. If $^9P_5 + 5.\ ^9P_4 = {}^{10}P_r$, then r =

(A) 4 (B) 5 (C) 6 (D) 7

17. The value of $1 + 1.1! + 2.2! + 3.3! + \ldots\ldots + n.n!$ is

(A) $(n + 1)! + 1$ (B) $(n - 1)! + 1$ (C) $(n + 1)! - 1$ (D) $(n + 1)!$

18. 15 buses fly between Hyderabad and Tirupati. The number of ways can a man go to Tirupati from Hyderabad by a bus and return by a different bus is

(A) 15 (B) 150 (C) 210 (D) 225

19. In a class of 10 students there are 3 girls. The number of ways they can be arranged in a row, so that no two girls are consecutive is $k.8!$, where k =

(A) 42 (B) 12 (C) 24 (D) 36

20. $S_1, S_2, \ldots, S_{10}$ are the speakers in a conference. If $S_1$ addresses only after $S_2$, then the number of ways the speakers address is

(A) 10! (B) 9! (C) $10 \times 8!$ (D) (10!)/2

21. The total number of 9 digit numbers which have all different digits is

(A) 9.9! (B) 10! (C) ${}^{10}P_9$ (D) $9^9$

22. The number of 6 digit numbers in which all the odd digits and only odd digits appear, is

(A) $\frac{5}{2}(6!)$ (B) 6! (C) $\frac{1}{2}(6!)$ (D) $\frac{5!}{2}$

23. The letters of the word 'ZENITH' are permuted in all possible ways and the words thus formed are arranged as in a dictionary. The rank of the word 'ZENITH' is

(A) 616 (B) 618 (C) 597 (D) 5930

24. The sum of all the numbers that can be formed by taking all the digits from 2, 3, 4, 5 is

(A) 93,324 (B) 79,992 (C) 66,66,600 (D) 78,456

25. The number of ways in which 6 gentlemen and 3 ladies be seated round a table so that every gentleman may have a lady by his side is

(A) 1440 (B)720 (C) 240 (D) 480

26. The number of ways in which 7 men be seated at a round table so that two particular men are not side by side is

(A) 2400 (B) 120 (D) 360 (D) 480

27. The letters of the word 'MADHURI' are arranged in all possible ways. The number of arrangements in which there are 2 letters between R and H is

(A) 360 (B) 480 (C) 960 (D) 720

28. The number of ways to arrange the letters of the word 'GARDEN' with vowels in alphabetical order is

(A) 360 (B) 240 (C) 120 (D) 480

29. The number of ways in which 7 Indians and 6 Pakistanis sit around a round table so that no two Indians are together is

(A) $(7!)^2$ (B) $(6!)^2$ (C) 6! 7! (D) zero

30. Number of ways in which 7 seats around a table can be occupied by 15 persons is

(A) ${}^{15}P_7$ (B) ${}^{15}C_7/7$ (C) ${}^{15}P_7/7$ (D) 14!