



MATHS

BOOKS - MODERN PUBLICATION MATHS (KANNADA ENGLISH)

BINOMIAL THEOREM

Mcq S Level I

1. The total number of terms in the expansion of $(x + a)^{51} - (x - a)^{51}$ after simplification is

A. 102

B. 23

C. 26

D. none of these

Answer: C



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2. If the coefficients of x^7 and x^8 in $\left(2 + \frac{x}{3}\right)^n$ are equal, then n is

A. 56

B. 55

C. 45

D. 15

Answer: B



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3. If $(1 + x + x^2)^n = a_0 + a_1x + a_2x^2 + \dots + a_{2n}x^{2n}$, then $a_0 + a_2 + a_4 + \dots + a_{2n}$ equals

A. $\frac{3^n + 1}{2}$

B. $\frac{3^n - 1}{2}$

C. $\frac{1 - 3^n}{2}$

D. $3^n + \frac{1}{2}$

Answer: A



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4. The coefficients of x^p and x^q (p and q are positive integers in the expansion of $(1 + x)^{p+q}$ are:

A. equal

B. equal with opposite sign

C. reciprocal of each other

D. none of these

Answer: A



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5. The number of terms in the expansion of $(a + b + c)^n$, where

$n \in \mathbb{N}$ is:

A. $\frac{(n + 1)(n + 2)}{2}$

B. $n + 1$

C. $n + 2$

D. $(n + 1)n$.

Answer: A



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6. The ratio of the coefficient of x^{15} to the term independent of x in $\left(x^2 + \frac{2}{x}\right)^{15}$ is

A. 12 : 32

B. 1 : 32

C. 32 : 12

D. 31 : 1

Answer: B



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7. If $z = \left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 + \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5$, then:

A. $Re(z) = 0$

B. $Im(z) = 0$

C. $Re(z) > 0, Im(z) > 0$

D. $Re(z) > 0, Im(z) < 0$

Answer: B



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8. The total number of terms in the expansion of $(x + a)^{100} + (x - a)^{100}$ after simplification is

A. 50

B. 202

C. 51

D. none of these

Answer: C



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9. Given the integers $r > 1$, $n > 2$ and coefficients of $(3r)$ th and $(r+2)$ nd terms in the binomial expansion of $(1 + x)^{2n}$ are equal, then:

A. $n=2r$

B. $n=3r$

C. $n=2r+1$

D. none of these

Answer: A



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10. The two successive terms in the expansion of $(1 + x)^{24}$ whose coefficients are in the ratio 1:4 are

- A. 3rd and 4th
- B. 4th and 5th
- C. 5th and 6th
- D. 6th and 7th

Answer: C



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11. The coefficients of x^n in the expansion of $(1+x)^{2n}$ and $(1+x)^{2n-1}$ are in the ratio

A. 1:2

B. 1:3

C. 3:1

D. 2:1

Answer: D



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12. If the coefficients of 2nd, 3rd and 4th terms in the expansion of $(1+x)^n$ are in A.P., then the value of n is:

A. 2

B. 7

C. 11

D. 14

Answer: B



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13. If A and B are coefficients of x^n in the expansion of $(1+x)^{2n}$ and $(1+x)^{2n-1}$ respectively, then $\frac{A}{B}$ equals:

A. 1

B. 2

C. $\frac{1}{2}$

D. $\frac{1}{n}$

Answer: B

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14. If the middle term of $\left(\frac{1}{x} + x \sin x\right)^{10}$ is equal to $7\frac{7}{8}$ then value of x is :

A. $2n\pi + \frac{\pi}{6}$

B. $n\pi + \frac{\pi}{6}$

C. $n\pi + (-1)^n \frac{\pi}{6}$

D. $n\pi + (-1)^n \frac{\pi}{3}$

Answer: C

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15. The number of terms in the expansion of $(1 + 3x + 3x^2 + x^3)^6$ is:

A. 8

B. 9

C. 19

D. 24

Answer: C



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16. The number of terms in the expansion of $(1 + 5x + 10x^2 + 10x^3 + 5x^4 + x^5)^{20}$ is

A. 100

B. 101

C. 120

D. none of these

Answer: B



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17. The number of terms in $(1 + x)^{101} (1 + x^2 - x)^{100}$ is:

A. 302

B. 301

C. 202

D. 101

Answer: C

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18. The number of integral terms in the expansion of $(5^{1/2} + 7^{1/6})^{642}$ is

A. 106

B. 108

C. 103

D. 109

Answer: B

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19. The number of non-zero terms in the expansion of $(1 + 3\sqrt{2}x)^9 + (1 - 3\sqrt{2}x)^9$ is

A. 9

B. 0

C. 5

D. 10

Answer: C



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20. The 5th term from the end in the expansion of $\left(\frac{x^3}{2} - \frac{2}{x}\right)^{12}$ is

A. $\frac{7920}{x^4}$

B. $-\frac{7920}{x^4}$

C. $7920x^4$

D. $-7920x^4$

Answer: C



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21. The unit digit of $17^{1983} + 11^{1983} - 7^{1983}$ is

A. 1

B. 2

C. 3

D. 0

Answer: A



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22. If the coefficient of x^7 in the expansion of $(ax^2 + b^{-1}x^{-1})^{11}$ is equal to the coefficient of x^{-7} in $(ax - b^{-1}x^{-2})^{11}$, then ab equals:

- A. 1
- B. 2
- C. 3
- D. 4

Answer: A



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23. The coefficient of x^{17} in

$(x - 1)(x - 2)(x - 3) \dots (x - 18)$ is:

A. 342

B. $\frac{171}{2}$

C. -171

D. 684

Answer: C



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24. The greatest integer which divides the number $101^{100} - 1$ is:

A. 100

B. 1000

C. 10000

D. 100000

Answer: C



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25. The coefficient of x^k in the expansion of $1 + (1 + x) + (1 + x)^2 + \dots + (1 + x)^n$ is

A. ${}^n C_k$

B. ${}^{n+1} C_k$

C. ${}^{n+1} C_{k+1}$

D. none of these

Answer: C



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26. The coefficient of x^{99} in

$(x + 1)(x + 3)(x + 5) \dots (x + 199)$ is

A. $1+2+3+ \dots+99$

B. $1+3+5+ \dots+199$

C. $1.3.5 \dots.199$

D. none of these

Answer: B



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27. If in the expansion of $(1 + x)^n$, a, b, c are three consecutive coefficients, then n equals

A. $\frac{ac + ab + bc}{b^2 + ac}$

B. $\frac{2ac + ab + bc}{b^2 - ac}$

C. $\frac{ab + ac}{b^2 - ac}$

D. none of these

Answer: B



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28. If $(1 + \alpha x)^n = 1 + 8x + 24x^2 + \dots$, then the value of α and n is

A. 2,4

B. 2,3

C. 3,6

D. 1,2

Answer: B



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29. Sum of all coefficients in the binomial expansion of $(x^2 + x - 3)^{319}$ is

A. 1

B. 2

C. -1

D. 0

Answer: C



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30. If the coefficient of x^7 and x^8 in $\left(2 + \frac{x}{3}\right)^n$ are equal, then n is

A. 56

B. 55

C. 45

D. 15

Answer: B



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31. Sum of coefficient of even powers of x in the expansion of $(1 + x + x^2 + x^3)^5$ is:

A. 256

B. 128

C. 512

D. 64

Answer: C



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32. In a binomial expansion $(1 + x)^n$, n is a positive integer, the coefficients of 5th, 6th and 7th terms are in A.P., then the value of n is

A. 7

B. 5

C. 3

D. 10

Answer: D



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33. In the expansion of $(1 + x)^{50}$, the sum of the coefficients of odd powers of x is :

A. 0

B. 2^{49}

C. 2^{50}

D. 2^{51}

Answer: B



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34. If in the expansion of $(a + x)^n$, P and Q represent the sum of odd and even terms respectively, then $P^2 - Q^2$ equals

A. $(a^2 - x^2)^n$

B. $(a^2 - x^2)^{2n}$

C. $(a^2 + x^2)^{2n}$

D. $(a^2 + x^2)^n$

Answer: A



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35. The coefficient of x^4 in the expansion of

$(1 + x + x^2 + x^3)^n$ is:

A. ${}^n C_4$

B. ${}^n C_4 + {}^n C_2$

C. ${}^n C_4 + {}^n C_2 + {}^n C_4 \cdot {}^n C_2$

D. ${}^n C_4 + {}^n C_2 + {}^n C_1 \cdot {}^n C_2$

Answer: D



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36. Which one is correct?

A. $(1999)^{2000} > (2000)^{1999}$

B. $(1998)^{1999} < (1999)^{1998}$

C. $(100)^{41} < (101)^{40}$

D. $26^{25} < 25^{26}$

Answer: A



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37. The value of:

$${}^{15}C_0^2 - {}^{15}C_1^2 + {}^{15}C_2^2 - \dots - {}^{15}C_{15}^2 \text{ is:}$$

A. 15

B. -15

C. 0

D. 51

Answer: C



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38. The value of

$$C_0 + 3C_1 + 5C_2 + 7C_3 + \dots + (2n + 1)C_n \text{ is:}$$

A. 2^n

B. $2^n + n \cdot 2^{n-1}$

C. $(n + 1) \cdot 2^n$

D. none of these

Answer: C



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39. The value of

$$C_1 + 4C_2 + 7C_3 + \dots + (3n - 2)C_n \text{ is}$$

A. $(3n - 4)^{2n+1}$

B. $(3n - 4)2^{n-1} + 2$

C. $(3n - 4)2^n$

D. $(3n - 4)2^{n-1} + 1$

Answer: B



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40. $C_0 - C_1 + C_2 - C_3 + \dots + (-1)^n C_n$ is equal to

A. 2^n

B. $2^n - 1$

C. 0

D. 2^{n-1}

Answer: C



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41. $\frac{1}{1!(n-1)!} + \frac{1}{3!(n-3)!} + \frac{1}{5!(n-5)!} + \dots$ Equals:

A. $\frac{2^n}{n!}$

B. $\frac{2^{n-1}}{n!}$

C. 0

D. none of these

Answer: B

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42. The middle term in the expansion of $(1 + x)^{2n}$ is:

A. $\frac{(2n)!}{n!} x^n$

B. $\frac{(2n)!}{n!(n-1)!} x^{n+1}$

C. $\frac{(2n)!}{(n!)^2} x^n$

D. $\frac{(2n)!}{(n+1)!(n-1)!} x^n$

Answer: A

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43. The middle term in the expansion of $\left(x + \frac{1}{2x}\right)^{2n}$, is

A. $\frac{1.3.5 \dots (2n - 3)}{n!}$

B. $\frac{1.3.5 \dots (2n - 1)}{n!}$

C. $\frac{1.3.5 \dots (2n + 1)}{n!}$

D. none of these

Answer: B

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44. Middle term in the expansion of $(1 + 3x + 3x^2 + x^3)^6$ is

A. 4th

B. 3rd

C. 10th

D. none of these

Answer: C



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45. Coefficient of the term independent of x in $\left(2x - \frac{3}{x}\right)^6$ is

A. 4320

B. 216

C. -216

D. -4320

Answer: D

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46. The fourth term in binomial expansion of $\left(x^2 - \frac{1}{x^3}\right)^n$ is independent of x , when n is equal to:

- A. 2
- B. 3
- C. 4
- D. none of these

Answer: D

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47. In the expansion of $\left(x^2 + \frac{2}{x}\right)^n$ for positive integer n has a term independent of x , then n is

A. 23

B. 18

C. 16

D. 0

Answer: B



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48. The term independent of x in the expansion of $\left(2x + \frac{1}{3x}\right)^6$ is:

A. $\frac{160}{9}$

B. $\frac{80}{9}$

C. $\frac{160}{27}$

D. $\frac{80}{3}$

Answer: C



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49. If the expansion of $\left(x^2 + \frac{2}{x}\right)^n$ for positive integer n has

13th term independent of x , then the sum of divisors of n is:

A. 36

B. 38

C. 39

D. 32

Answer: C



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50. If $x = \frac{1}{3}$, then the greatest term in the expansion of $(1 + 4x)^8$ is the

- A. 4th term
- B. 5th term
- C. 6th term
- D. 3rd term

Answer: C



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51. The largest term in the expansion of $(3 + 2x)^{50}$ where $x = \frac{1}{5}$ is:

- A. 5th
- B. 51st
- C. 7th
- D. 6th

Answer: C



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52. The greatest coefficient in the expansion of $(1 + x)^{2n+2}$ is:

- A. $\frac{(2n)!}{(n!)^2}$
- B. $\frac{(2n+2)!}{[(n+1)!]^2}$

C. $\frac{(2n + 2)!}{n!(n + 1)!}$

D. $\frac{(2n)!}{n!(n + 1)!}$

Answer: B

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53. Let $a_n = \frac{1000^n}{n!}$ for $n \in \mathbb{N}$. Then a_n is greatest when:

A. $n=997$

B. $n=998$

C. $n=999$

D. $n=996$

Answer: C

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54. If x is nearly equal to 1, then: $\frac{mx^m - nx^n}{m - n}$ equals:

A. x^{m+n}

B. x^{m-n}

C. x^m

D. x^n

Answer: A



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55. Remainder when 7^{103} is divided by 125 is:

A. 17

B. 125

C. 118

D. 19

Answer: C



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56. In the expansion of the following expression:

$1 + (1 + x) + (1 + x)^2 + \dots + (1 + x)^n$, the coefficient of x^k ($0 \leq k \leq n$) is:

A. ${}^{n+1}C_{k+1}$

B. nC_k

C. ${}^nC_{n-k-1}$

D. none of these

Answer: A



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57. Let n be an odd natural number of greater than 1. then the number of zeros at the end of the sum $999^n + 1$ is:

A. 3

B. 4

C. 2

D. none of these

Answer: A



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58. $101^{100} - 1$ is divisible by

A. 100

B. 101

C. 99

D. 1001

Answer: A



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59. If the seventh terms from the beginning and the end in the

expansion of $\left(\sqrt[3]{2} + \frac{1}{\sqrt[3]{2}}\right)^n$ are equal, then n equals:

A. 9

B. 12

C. 15

D. 18

Answer: B



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60. If $\{x\}$ denotes the fractional part of x , then $\left\{ \frac{3^{2n}}{8} \right\}, n \in N$ is:

A. $\frac{3}{8}$

B. $\frac{7}{8}$

C. $\frac{1}{8}$

D. none of these

Answer: C



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61. The number of terms whose values depend on x in the expansion of $\left(x^2 - 2 + \frac{1}{x^2}\right)^n$ is:

A. $2n+1$

B. $2n$

C. n

D. none of these

Answer: B



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62. The coefficient of x^3 in the expansion of $(1 - x + x^2)^5$ is

A. 10

B. -20

C. -50

D. -30

Answer: D



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63. The coefficient of x^6 in:

$$\left[(1+x)^6 + (1+x)^7 + \dots + (1+x)^{15} \right] \text{ is:}$$

A. ${}^{16}C_9$

B. ${}^{16}C_5 - {}^6C_5$

C. ${}^{16}C_6 - 1$

D. none of these

Answer: A



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64. If the r th term is the middle term in the expansion of

$\left(x^2 - \frac{1}{2x}\right)^{20}$, then the $(r+3)$ th term is:

A. ${}^{20}C_{14} \cdot \frac{1}{2^{14}} \cdot x$

B. ${}^{20}C_{12} \cdot \frac{1}{2^{12}} \cdot x^2$

C. $-\frac{1}{2^{13}} \cdot {}^{20}C_7 \cdot x$

D. none of these

Answer: C



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65. The sum of last ten coefficients in the expansion of $(1 + x)^{19}$ when expanded in ascending powers of x is

A. 2^{18}

B. 2^{19}

C. $2^{18} - {}^{19}C_{10}$

D. none of these

Answer: B



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66. The sum

$\frac{1}{2} {}^{10}C_0 - {}^{10}C_1 + 2 \cdot {}^{10}C_2 - 2^2 \cdot {}^{10}C_3 + \dots + 2^9 \cdot {}^{10}C_{10}$ equals:

A. $\frac{1}{2}$

B. 0

C. $\frac{1}{2} \cdot 3^{10}$

D. none of these

Answer: A



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67. For $2 \leq r \leq n$, $\binom{n}{r} + 2\binom{n}{r-1}\binom{n}{r-2} =$

A. $\binom{n+1}{r-1}$

B. $2\binom{n+1}{r+1}$

C. $2\binom{n+2}{r}$

D. $\binom{n+2}{r}$

Answer: D



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68. The coefficient of x^5 in $(1 + 2x + 3x^2 + \dots)^{-3/2}$ is:

A. 21

B. 25

C. 26

D. none of these

Answer: D



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69. If $|x| < 1$, then coefficient of x^n in expansion of:

$(1 + x + x^2 + x^3 + \dots)^2$ is

A. n

B. $n - 1$

C. $n + 2$

D. $n + 1$

Answer: D



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70. The sum $\sum_{i=0}^m \binom{10}{i} \binom{20}{m-i}$ (where $\binom{p}{q} = 0$, if $p < q$) is maximum, when m is:

A. 5

B. 10

C. 15

D. 20

Answer: C



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71. The number of integral terms in the expansion of $(\sqrt{3} + \sqrt[8]{5})^{256}$ is

A. 33

B. 34

C. 35

D. 32

Answer: A



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72. If x is positive, the first negative term in the expansion of $(1 + x)^{27/5}$ is:

- A. 5th term
- B. 8th term
- C. 6th term
- D. 7th term

Answer: B

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73. Coefficient of t^{24} in $(1 + t^2)^{12}(1 + t^{12})(1 + t^{24})$ is:

- A. ${}^{12}C_5 + 3$
- B. ${}^{12}C_6 + 1$

C. ${}^{12}C_6$

D. ${}^{12}C_6 + 2$

Answer: D

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74. The coefficient of the middle term in the binomial expansion in powers of x of $(1 + \alpha x)^4$ and of $(1 - \alpha x)^6$ is the same of α equals:

A. $-\frac{5}{3}$

B. $\frac{10}{3}$

C. $-\frac{3}{10}$

D. $\frac{3}{5}$

Answer: C



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75. The coefficient of x^n in the expansion of $(1 + x)(1 - x)^n$ is

A. $n - 1$

B. $(-1)^n(1 + n)$

C. $(-1)^{n-1}(n - 1)^2$

D. $(-1)^{n-1}n$.

Answer: B



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1. If 7 divides $32^{32^{32}}$, the remainder is:

A. 1

B. 0

C. 4

D. 6

Answer: C



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2. The number of terms free from radical sign in the expansion of

$\left(1 + 3^{1/3} + 7^{1/7}\right)^{10}$ is:

A. 1

B. 6

C. 11

D. none of these

Answer: B



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3. The number of irrational terms in the expansion of

$$\left(\sqrt[8]{5} + \sqrt[6]{2}\right)^{100} \text{ is:}$$

A. 97

B. 98

C. 96

D. 99

Answer: A



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4. The number of rational terms in the expansion of $(1 + \sqrt{2} + \sqrt[3]{3})^6$ is:

A. 6

B. 7

C. 5

D. 8

Answer: B

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5. If $x + y = 1$, then $\sum_{r=0}^n r^{2n} C_r x^r y^{n-r}$ equals:

A. nxy

B. $nx(n+ny)$

C. $nx(nx+y)$

D. none of these

Answer: C



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6. If n is a positive integer, which of the following two will always be integers:

(I) $(\sqrt{2} + 1)^{2n} + (\sqrt{2} - 1)^{2n}$

(II) $(\sqrt{2} + 1)^{2n} - (\sqrt{2} - 1)^{2n}$

(III) $(\sqrt{2} + 1)^{2n+1} + (\sqrt{2} - 1)^{2n+1}$

(IV) $(\sqrt{2} + 1)^{2n+1} - (\sqrt{2} - 1)^{2n+1}$

- A. Only I and II
- B. Only I and III
- C. Only I and IV
- D. Only II and III

Answer: C



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7. The value of x for which the sixth term in the expansion of

$$\left[2^{\log_2 (\sqrt{9^{x-1}+7})} + \frac{1}{2^{1/5 \log_2 (3^{x-1}+1)}} \right] \text{ is } 84, \text{ is}$$

- A. 4
- B. 3
- C. 2
- D. 5

Answer: C



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8. If the third term in $(x + x^{\log_{10} x})^5$, is 10^6 , then x may be:

A. 1

B. 10

C. $10^{-7/2}$

D. 10^2

Answer: B



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9. If the 6th term in the expansion of $\left(\frac{1}{x^{8/3}} + x^2 \log_{10} x\right)^8$ is 5600, then x equals:

A. 1

B. $\log_e 10$

C. 10

D. x does not exist

Answer: C



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10. If three consecutive coefficients in the expansion of $(1 + x)^n$ are in the ratio 1:3:5, then the value of n is:

A. 6

B. 7

C. 8

D. 9

Answer: B



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11. For integer $n > 1$, the digit at unit's place in the number

$$\sum_{r=0}^{100} r! + 2^{2^n} \text{ is:}$$

A. 0

B. 1

C. 2

D. none of these

Answer: A



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12. The digit at unit's place in $2^{9^{100}}$ is:

A. 2

B. 4

C. 6

D. 8

Answer: A



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13. If in the expansion of $(1 + x)^m(1 - x)^n$ the coefficients of x and x^2 are 3 and -6 respectively then m is

A. 6

B. 9

C. 12

D. 24

Answer: C



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14. The coefficient of x^{53} in the expansion of:

$$\sum_{m=0}^{100} {}^{100}C_m (x - 3)^{100-m} 2^m \text{ is:}$$

A. ${}^{100}C_{47}$

B. ${}^{100}C_{53}$

C. $-{}^{100}C_{53}$

D. $-{}^{100}C_{54}$

Answer: C



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15. The coefficient of x^4 in the expansion of :

$(1 + x + x^2 + x^3)^n$ is:

A. nC_4

B. ${}^nC_4 + {}^nC_2$

C. ${}^nC_4 + {}^nC_2 + {}^nC_4 \cdot {}^nC_2$

D. ${}^nC_4 + {}^nC_2 + {}^nC_1 \cdot {}^nC_2$

Answer: D



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16. In the expansion of $(1 + x + x^3 + x^4)^4$, the coefficient of x^4 is:

A. ${}^{40}C_4$

B. ${}^{10}C_4$

C. 210

D. 310

Answer: D



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17. If the sum of the coefficient in the expansion of $(\alpha^2 x^2 - 2\alpha x + 1)^{51}$ vanishes, then α equals:

A. 2

B. -1

C. 1

D. -2

Answer: C



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18. If $(3\sqrt{3} + 5)^{2n+1} = p + f$, where p is an integer and f is a proper fraction, then $f(p + f)$ equals:

A. 5^{n+1}

B. 3^{2n+1}

C. 2^{2n+1}

D. 3^{2n+1}

Answer: C



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19. The larger of $99^{50} + 100^{50}$ and 101^{50} is:

A. $99^{50} + 100^{50}$

B. both are equal

C. 101^{50}

D. none of these

Answer: C

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20. Find the value of x in the expansion of $[x + x^{\log_{10} x}]^5$, if the third term in the expansion is 10,00,000:

A. 10

B. 11

C. 12

D. none of these

Answer: A

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21. Value of $2C_0 + \frac{2^2}{2}C_1 + \frac{2^3}{3}C_2 + \dots + \frac{2^{11}}{11}C_{10}$ is:

A. $\frac{3^{11} - 1}{11}$

B. $\frac{2^{11} - 1}{11}$

C. $\frac{11^3 - 1}{11}$

D. $\frac{11^2 - 1}{11}$

Answer: A



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22. Sum to $(n + 1)$ terms of the series:

$$\frac{C_0}{2} - \frac{C_1}{3} + \frac{C_2}{4} - \frac{C_3}{5} + \dots \text{ is:}$$

A. $\frac{1}{n + 1}$

B. $\frac{1}{n + 2}$

C. $\frac{1}{n(n + 1)}$

D. none of these

Answer: D



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23. If n is an even integer, then:

$C_0^2 - C_1^2 + C_2^2 - C_3^2 + \dots + (-1)^n C_n^2$ is:

A. ${}^{2n}C_n$

B. $(-1)^{n2n} C_n$

C. $(-1)^{n2n} C_{n-1}$

D. none of these

Answer: D



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24. If $(1 + x)^n = C_0 + C_1x + C_2x^2 + \dots + C_nx^n$, then the value of :

$C_1 + 2C_2 + 3C_3 + \dots + nC_n$ is:

A. $n \cdot 2^{n-1}$

B. $(n + 2)2^n$

C. $(n + 1)2^{n-1}$

D. $(n + 2) \cdot 2^{n-1}$

Answer: A

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25. If m, n, r are positive integers such that $r < m, n$, then:

$${}^m C_r + {}^m C_{r-1} {}^n C_1 + {}^m C_{r-2} {}^n C_2 + \dots + {}^m C_1 {}^n C_{r-1} + {}^n C_r$$

equals:

A. $({}^nC_r)^2$

B. ${}^{m+n}C_r$

C. ${}^{m+n}C_r + {}^{m-(r)} + {}^nC_r$

D. none of these

Answer: B

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26. If in the expansion of $\left(2a - \frac{a^2}{4}\right)^9$, the sum of middle terms is S , then the following is true:

A. $S = \left(\frac{63}{32}\right)a^{14}(a + 8)$

B. $s = \left(\frac{63}{32}\right)a^{14}(a - 8)$

C. $S = \left(\frac{63}{32}\right)a^{13}(a - 8)$

D. $S = \left(\frac{63}{32}\right)a^{13}(a - 8)$

Answer: D



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27. The term independent of x in the expansion of $(1 + x)^n \left(1 - \frac{1}{x}\right)^n$ is:

A. $C_0^2 + 2C_1^2 + \dots + (n + 1)C_n^2$

B. $(C_0 + C_1 + \dots + C_n)^2$

C. $C_0^2 + C_1^2 + \dots + C_n^2$

D. none of these

Answer: D



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28. The greatest value of the term independent of x in the expansion of $(x \sin \alpha + x^{-1} \cos \alpha)^{10}$, $\alpha \in R$, is:

A. 2^5

B. $\frac{10!}{(5!)^2}$

C. $\frac{1}{2^5} \cdot \frac{10!}{(5!)^2}$

D. none of these

Answer: C



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29. If the largest interval to which x belongs so that the greatest term in $(1 + x)^{2n}$ has the greatest coefficient is $\left(\frac{10}{11}, \frac{11}{10}\right)$, then n equals:

A. 9

B. 10

C. 11

D. none of these

Answer: B



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30. Let $R = (5\sqrt{5} + 11)^{2n+1}$ and $f = R - [R]$, where $[\]$

denotes the greater integer function, then Rf is equal to :

A. 4^{2n+1}

B. 4^{2n}

C. 4^{2n-1}

D. none of these

Answer: A



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31. If the coefficients of the middle term of $(1 + x)^{2n+2}$ is p and the coefficient of middle terms in the expansion of $(1 + x)^{2n+1}$ are q and r , then

A. $p+q=r$

B. $p+r=q$

C. $p=q+r$

D. $p+q+r=0$

Answer: C



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32. $\sum_{r=1}^n \left(\sum_{p=0}^{r-1} {}^n C_r {}^r C_p 2^p \right)$ is equal to:

A. $4^n - 3^n + 1$

B. $4^n - 3^n - 1$

C. $4^n - 3^n + 2$

D. $4^n - 3^n$

Answer: D



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33. The term independent of x in the expression of

$(1 + x + 2x^3) \left(\frac{3}{2}x^2 - \frac{1}{3x} \right)^9$ is:

A. $\frac{7}{18}$

B. $\frac{17}{54}$

C. $\frac{7}{18} + \frac{2}{27}$

D. $\frac{7}{18} - \frac{2}{27}$

Answer: B

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34. If $\frac{1}{1!11!} + \frac{1}{3!9!} + \frac{1}{5!7!} = \frac{2^p}{q!}$ and $f(x + y) = f(x) \cdot f(y)$

for all x and y , $f(1) = 1$, $f'(0) = 10$, then:

A. $f'(p) = q$

B. $f'(q) = p$

C. $f'(p) \neq f'(q)$

D. none of these

Answer: B





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35.

If

$$(1 + x)^n = \sum_{r=0}^n a_r x^r \text{ and } b_r = 1 + \frac{a_r}{a_{r-1}}, \text{ and } \prod_{r=1}^n b_r = \frac{(101)^{100}}{100!}$$

then n equals:

A. 99

B. 100

C. 101

D. none of these

Answer: B



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36. Find the coefficient of $x^6 y^3$ in the expansion of $(x + 2y)^9$

A. 4: 2: 1

B. 2: 4: 1

C. 1: 2: 4

D. 2: 3: 4

Answer: C



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37. If C_r stands for ${}^n C_r$ and $\sum_{r=1}^n \frac{r \cdot C_r}{C_{r-1}} = 210$, then n equals:

A. 19

B. 20

C. 21

D. none of these

Answer: B



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38. For a positive integer n ,

let $a(n) = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots + \frac{1}{2^n - 1}$ Then:

A. $a(100) \leq 100$

B. $a(100) > 100$

C. $a(200) < 100$

D. $a(200) \geq 100$.

Answer: D



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39. In the binomial expansion of $(a - b)^n$, $n \geq 5$, the sum of the 5th and 6th terms is zero. Then $\frac{a}{b}$ equals:

A. $\frac{n - 5}{6}$

B. $\frac{n - 4}{5}$

C. $\frac{5}{n - 4}$

D. $\frac{6}{n - 5}$.

Answer: B



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40. The value of

$$\binom{30}{0} \binom{30}{10} + \binom{30}{1} \binom{30}{11} + \binom{30}{2} \binom{30}{12} + \cdots + \binom{30}{20} \binom{30}{30}$$

is:

A. $\binom{60}{20}$

B. $\binom{30}{10}$

C. $\binom{30}{20}$

D. 1

Answer: B



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41. For natural number m, n if

$$(1 - y)^m(1 + y)^n = 1 + a_1y + a_2y^2 + \dots, \text{ and } a_1 = a_2 = 10$$

, then (m,n) is

A. (20,45)

B. (35,20)

C. (45,35)

D. (35,45)

Answer: D



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42. In the binomial expansion of $(a - b)^n$, $n \geq 5$, the sum of 5th and 6th terms is zero then $\frac{a}{b}$ equals:

A. $\frac{6}{n - 5}$

B. $\frac{n - 5}{6}$

C. $\frac{n - 4}{5}$

D. $\frac{5}{n - 4}$

Answer: C



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43. If a_1, a_2, a_3, a_4 are coefficients of any four consecutive terms in the expansion of $(1 + x)^n$, then $\frac{a_1}{a_1 + a_2} + \frac{a_3}{a_3 + a_4}$ equals:

A. $\frac{a_2}{a_2 + a_3}$

B. $\frac{1}{2} \frac{a_2}{a_2 + a_3}$

C. $\frac{2a_2}{a_2 + a_3}$

D. $\frac{2a_3}{a_2 + a_3}$

Answer: C



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44. If n is a positive integer and $C_k = {}^n C_k$, then the value of

$\sum_{k=1}^n k^3 \left(\frac{C_k}{C_{k-1}} \right)^2$ equals:

A. $\frac{n(n+1)(n+2)}{12}$

B. $\frac{n(n+1)^2}{12}$

C. $\frac{n(n+2)^2(n+1)}{12}$

D. none of these

Answer: D



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45. If $(1+x)^n = 1 + C_1x + C_2x^2 + \dots + C_nx^n$, then:

$C_1^2 - 2C_2^2 + 3C_3^2 - \dots - 2nC_{2n}^2$ is:

A. n^2

B. $(-1)^{n-1}n$

C. $(-1)^{n-1}n \cdot {}^{2n-1}C_n$

D. $-n^2$

Answer: C



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46. Let n be an odd integer. If $\sin n\theta = \sum_{r=0}^n b_r \sin^r \theta$ for every value of θ , then

A. $b_0 = 1, b_1 = 3$

B. $b_0 = 0, b_1 = n$

C. $b_0 = -1, b_1 = n$

D. $b_0 = 0, b_1 = n^2 = n^2 - 3n + 3$

Answer: B



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47. The coefficient of x^{50} in the expression:

$$(1+x)^{1000} + 2x(1+x)^{999} + 3x^2(1+x)^{998} + \dots + 1001x^{1000}$$

is:

A. ${}^{1000}C_{50}$

B. ${}^{1001}C_{50}$

C. ${}^{1002}C_{50}$

D. ${}^{1000}C_{51}$

Answer: C



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48. The last term in the binomial expression of $\left(\sqrt[3]{2} - \frac{1}{\sqrt{2}}\right)^n$ is

$\left(\frac{1}{3} \cdot \frac{1}{\sqrt[3]{9}}\right)^{\log_3 8}$. Then the 5th term from the beginning is

A. ${}^{10}C_6$

B. $2 \cdot {}^{10}C_4$

C. $\frac{1}{2} {}^{10}C_4$

D. none of these

Answer: A



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49. Let $n \in N$. If $(1 + x)^n = a_0 + a_1x + a_2x^2 + \dots + a_nx^n$ and $a_{n-3}, a_{n-2}, a_{n-1}$ are in A.P. then:

A. a_1, a_2, a_3 are in A.P.

B. a_1, a_2, a_3 are in H.P.

C. $n=6$

D. $n=14$

Answer: A

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50. If the coefficient of r th, $(r+1)$ th and $(r+2)$ th terms in the binomial expansion of $(1 + y)^m$ are in A.P. then m and r satisfy the equation:

A. $m^2 - m(4r + 1) + 4r^2 + 2 = 0$

B. $m^2 - m(4r - 1) + 4r^2 - 2 = 0$

C. $m^2 - m(4r - 1) + 4r^2 + 2 = 0$

D. $m^2 - m(4r + 1) + 4r^2 - 2 = 0$

Answer: D

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51. If the coefficient of x^7 in $\left[ax^2 + \left(\frac{1}{bx}\right)\right]^{11}$ equals the coefficient of x^{-7} in $\left[ax - \left(\frac{1}{bx^2}\right)\right]^{11}$, then a and b satisfy the relation:

A. $a+b=1$

B. $a-b=1$

C. $ab=1$

D. $\frac{a}{b} = 1$

Answer: C



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52. If x is so small that x^3 and higher powers of x may be

neglected, then $\frac{(1+x)^{3/2} - \left(1 + \frac{1}{2}x\right)^3}{(1-x)^{1/2}}$ may be approximated

as:

A. $3x + \frac{3}{8}x^2$

B. $1 - \frac{3}{8}x^2$

C. $\frac{x}{2} - \frac{3}{8}x^2$

D. $-\frac{3}{8}x^2$

Answer: D



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53. If the expansion in powers of x of the function

$$\frac{1}{(1 - ax)(1 - bx)}$$
 is $a_0 + a_1x + a_2x^2 + a_3x^3 + \dots$ then a_n

is:

A. $\frac{b^n - a^n}{b - a}$

B. $\frac{a^n - b^n}{b - a}$

C. $\frac{a^{n+1} - b^{n+1}}{b - a}$

D. $\frac{b^{n+1} - a^{n+1}}{b - a}$

Answer: D

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54. The sum of series:

$${}^{20}C_0 - {}^{20}C_1 + {}^{20}C_2 - {}^{20}C_3 + \dots + {}^{20}C_{10} \text{ is:}$$

A. $\frac{1}{2} {}^{20}C_{10}$

B. 0

C. ${}^{20}C_{10}$

D. $-{}^{20}C_{10}$

Answer: A

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55. The remainder left out when $8^{2n} - (62)^{2n+1}$ is divided by 9 is

A. 0

B. 2

C. 7

D. 8

Answer: B

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Latest Question From Aieee Jee Examinations

1. For $r=0,1, \dots, 10$ let A_r, B_r and C_r denote respectively, the coefficient of x^r in the expansions of :
 $(1+x)^{10}, (1+x)^{20}$ and $(1+x)^{30}$.

Then $\sum_{r=1}^{10} (B_{10}B_r - C_{10}A_r)$ is equal to:

A. $B_{10} - C_{10}$

B. $A_{10}(B_{10}^2 - C_{10}A_{10})$

C. 0

D. $C_{10} - B_{10}$

Answer: D



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2. The coefficient of x^7 in the expansion of $(1 - x - x^2 + x^3)^6$

is:

A. 144

B. - 132

C. - 144

D. 132

Answer: C



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3. If n is a positive integer, then:

$(\sqrt{3} + 1)^{2n} - (\sqrt{3} - 1)^{2n}$ is:

A. an irrational number

B. an odd positive integer

C. an even positive integer

D. a rational number other than positive integers

Answer: A

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4. The term independent of x in expansion of

$$\left(\frac{x+1}{x^{2/3} - x^{1/3} + 1} - \frac{x-1}{x - x^{1/2}} \right)^{10} \text{ is:}$$

A. 120

B. 210

C. 310

D. 4

Answer: B

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5. If the coefficients of x^3 and x^4 in the expansion of $(1 + ax + bx^2)(1 - 2x)^{18}$ in powers of x are both zero, then

(a,b) is equal to:

A. $\left(14, \frac{251}{3}\right)$

B. $\left(14, \frac{272}{3}\right)$

C. $\left(16, \frac{272}{3}\right)$

D. $\left(16, \frac{251}{3}\right)$

Answer: C



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6. The sum of coefficients of integral powers of x in the binomial expansion of $(1 - 2\sqrt{x})^{50}$ is:

A. $\frac{1}{2}(3^{50} + 1)$

B. $\frac{1}{2}(3^{50})$

C. $\frac{1}{2}(3^{50} - 1)$

D. $\frac{1}{2}(2^{50} + 1)$

Answer: A



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Rcq 5 Recent Competitive Questions Questions From Karnataka Cet Comed

1. If the value of $C_0 + 2C_1 + 3C_2 + \dots + (n + 1)C_n = 576$,
then n is

A. 7

B. 5

C. 6

D. 9

Answer: A



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2. If x^r occurs in the expansion of $\left(x + \frac{1}{x}\right)^n$, then its coefficient

is

A. $\frac{n!}{(r!)^2}$

B. $\frac{n!}{(r+1)!(r-1)!}$

C. $\frac{n!}{\left(\frac{n+r}{2}\right)!\left(\frac{n-r}{2}\right)!}$

D. $\frac{n!}{\left[\left(\frac{r}{2}\right)!\right]^2}$

Answer: C



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3. If $C_0, C_1, C_2, \dots, C_n$ are binomial coefficients of order n , then the value of $\frac{C_1}{2} + \frac{C_2}{4} + \frac{C_3}{6} + \dots =$

A. $\frac{2^n + 1}{n + 1}$

B. $\frac{2^n - 1}{n + 1}$

C. $\frac{2^n + 1}{n - 1}$

D. $\frac{2^n}{n + 1}$

Answer: B



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4. If 215 and 22nd lens in the expansion of $(1 + x)^{44}$ one is equal, then x is equal to

A. $\frac{21}{22}$

B. $\frac{23}{24}$

C. $\frac{8}{7}$

D. $\frac{7}{8}$

Answer: D



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5. If in the expansion of $(1 + px)^n$, $n \in N$, the coefficient of x and x^2 are 8 and 24, than the values of n and p are:

A. $n=3, p=2$

B. $n=5, p=3$

C. $n=4, p=3$

D. $n=4, p=2$

Answer: D



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6. The middle term of expansion $\left(\frac{10}{x} + \frac{x}{10}\right)^{10}$ is

A. 7C_5

B. 8C_5

C. 9C_5

D. ${}^{10}C_5$

Answer: D



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