MATHS

BOOKS - OBJECTIVE RD SHARMA ENGLISH

PERMUTATIONS AND COMBINATIONS

Illustration

1. If $n!, 3 \times n!$ and $(n+1)!$ are in GP, then $n!, 5 \times n! And (n+1)!$ are in

A. A.P.

B. G.P.

C. H.P.

D. none of these

Answer: A

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2. If $a_n = \frac{n}{(n+1)!}$ then find $\sum_{n=1}^{50} a_n$

A. $\frac{50!-1}{50!}$

B. $\frac{51!-1}{51!}$

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

D. none of these

Answer: B

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3. If $a_n = n(n!)$, then $\sum_{r=1}^{100} a_r$ is equal to

A. 101!

B. 100!-1

C. 101!-1

D. 101!+1

Answer: C

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4. 1.1!+2.2!+3.3!+.......n.n!` is equal to

A. $(n+1)!$

B. $(n+1)!+1$

C. $(n+1)!-1$

D. none of these

Answer: C

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5. Sum of the series $\sum_{r=1}^{n}(r^2+1)r!$ is

A. $(n+1)!$

B. $(n+2)!-1$

C. $n(n+1)!$

D. none of these

Answer:

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6. Find the exponent of 3 in 100!

A. 47

B. 48

C. 49

D. 46

Answer:

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7. the exponent of 15 in $100!,$ is

A. 48

B. 24

C. 25

D. 23

Answer: B

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8. Number of zeros in the expansion of $100!$ is

A. 22

B. 23

C. 24

D. 25

Answer:

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9. The exponent of 12 in 100! Is

A. 24

B. 46

C. 47

D. 48

Answer: D

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10. If $\frac{{}^{n+2}C_6}{{}^{n-2}P_2} = 11$, then n satifes the equation

A. $n^2 + n - 110 = 0$

B. $n^2 + 5n - 84 = 0$

C. $n^2 + 3n - 108 = 0$

D. $n^2 + 2n = 0$

Answer:

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11. If $.^n P_r = 720 \text{ and } .^n C_r = 120$ then find the value of r.

A. 3

B. 5

C. 4

D. 7

Answer: A

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12. The number of positive intergers satisfying the in-equality

$^{n+1}C_{n-2} - ^{n+1}C_{n-1} \leq 100$, is

A. 6

B. 8

C. 5

D. none of these

Answer:

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13. If $\hat{} (15)C_{3r} = ^{15} C_{r+3}$, then find r.

A. 5

B. 4

C. 3

D. 2

Answer: C

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14. If $^{20}C_r = {}^{20}C_{r-10}, \ then \ {}^{18}C_r$ is equal to 'a. 4896 b. 816 c. 1632 d. none of these'

A. 4896

B. 816

C. 1632

D. none of these

Answer: B

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15. If $\hat{}\ n-1C_r=\left(k^2-3\right)^n C_{r+1}, then k\in$ $\left(-\infty, -2\right]$ b. $\left[2, \infty\right)$ c. $\left[-\sqrt{3}, \sqrt{3}\right]$ d. $\left(\sqrt{3}, 2\right]$

A. $\left[-\sqrt{3}, \sqrt{3}\right]$

B. $\left(-\infty, -2\right)$

C. $\left(2, -\infty\right)$

D. $\left(\sqrt{3}, 2\right]$

Answer:

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16. For $2 \leq r \leq n$, $\binom{n}{r} + 2\binom{n}{r-1} + \binom{n}{r-2}$ is equal to

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

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

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

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

Answer: C

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17. the value of""" (40)C_(31)+sum_(r=0)"""^(40+r)C_(10-r) is equal to

A. ${}^{51}C_{20}$

B. $2^{50}C_{20}$

C. $2^{45}C_{15}$

D. none of these

Answer:

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18. The value of ${}^{50}C_4 + \sum_{r=1}^{6} {}^{56-r}C_3$, is

A. ${}^{56}C_4$

B. ${}^{56}C_3$

C. ${}^{55}C_3$

D. ${}^{55}C_4$

Answer:

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19. What is $.^{47}C_4 + .^{51}C_3 + \sum_{j=2}^{5} .^{52-j}C_3$ equal to ?

A. $^{52}C_4$

B. $^{52}C_3$

C. $^{51}C_4$

D. $^{53}C_4$

Answer:

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20. If $n \geq r$, then

$^{r}C_r + {}^{r+1}C_r + {}^{r+2}C_r + \ldots\ldots + {}^{n}C_r$ is equal to

A. $^{n+1}C_r$

B. ${}^{n+1}C_{r+1}$

C. ${}^{n+2}C_{r+1}$

D. ${}^{n+2}C_{r+2}$

Answer:

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21. $\sum_{k=m}^{n} {}^{k}C_{r}$

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

B. ${}^{n+1}C_{r+1} - {}^{m}C_{r}$

C. ${}^{n+1}C_{r+1} - {}^{m}C_{r+1}$

D. ${}^{n+1}C_{r+1} + {}^{m}C_{r+1}$

Answer:

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22. The exponent of 7 in $.^{100}C_{50}$ is

A. 0

B. 2

C. 4

D. none of these

Answer: A

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23. In a class there are 10 boys and 8 girls. The teacher wants to select either a boy or a girl to represent the class in a function.

The number of ways the teacher can make this selection.

A. 18

B. 80

C. 10^8

D. 8^{10}

Answer: A

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24. In a class there are 10 boys and 8 girls. The teacher wants to select either a boy or a girl to represent the class in a function. The number of ways the teacher can make this selection.

A. 18

B. 80

C. 8^{10}

D. 10^{8}

Answer: A

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25. There are 3 candidates for a classical, 5 for a Mathematical,, and 4 for a Natural science scholarship. In how many ways can these scholarships be awarded? In how many ways one of these scholarships be awarded?

A. 12

B. 20

C. 60

D. 64

Answer:

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26. A code ward of length 4 consists two distinct consonant in the English alphabet followed by two digits from 1 to 9 with repetition allowed in digits. If the number of code wards so formed ending with an even digit is $432 \times k$, then k is equal to

A. 7

B. 5

C. 49

D. 35

Answer:

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27. Five persons entered the lift cabin on the ground floor of an 8-floor house. Suppose each of them can leave the cabin independently at any floor beginning with the first. Find the total number of ways in which each of the five persons can leave the cabin (i) at any one of the 7 floors (ii) at different floors.

A. 5^7

B. 2520

C. 7^5

D. 35

Answer:

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28. The number of ways in which n distinct balls can be put into three boxes, is

A. 3n

B. n^3

C. 3^n

D. $n + 3$

Answer: C

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29. Find the total number of ways in which n distinct objects can be put into two different boxes so that no box remains empty.

A. 2^n

B. $2^n - 1$

C. $2^n - 2$

D. $2^n - 3$

Answer: C

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30. Find the total number of ways of answering 5 objective type questions, each question having 4 choices.

A. 5^4

B. 4^5

C. 20

D. 9

Answer: B

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31. There are 10 true-false questions in an examination. Then these questions can be answered in

A. 240

B. 20

C. 1024

D. 100

Answer:

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32. For a set of five true/false questions, no student has written all correct answers, and no tow students have given the same sequence of answers. What is the maximum number of students in the classes, for this to be possible?

A. 9

B. 32

C. 31

D. 24

Answer: C

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33. The number of ways in which one can post 4 letters in 5 letter boxes, is

A. 4^5

B. 5^4

C. 20

D. 9

Answer: B

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34. Four die are rolled. The number of ways in which atleast one die shows 3, is

(a) 625 (b) 671 (c) 1256 (d) 1296

A. 625

B. 671

C. 1296

D. 1256

Answer: B

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35. A sequence is a termary sequence, if it contains digits 0, 1 and 2. The total numbre of teranryn sequences of length 9 which either begin with 210 or end with 210, is

A. 1458

B. 1431

C. 729

D. 707

Answer:

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36. The number of ways in which five distinct objects can be put into three identical boxes so that no box remains empty is

A. $2^n - 1$

B. $2^n - 2$

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

D. none of these

Answer:

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37. A gentle man wants to invite six friends. In how many ways can he send invitation cards to them, if he has three servants to carry the cards.

A. 3^6

B. 6^3

C. 18

D. none of these

Answer:

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38. There are unlimited number of identical balls of four different colours. How many arrangements of at most 8 balls in row can be made by using them?

A. 21845

B. 87380

C. 262140

D. none of these

Answer:

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39. A rectangle with sides $2m-1 and 2n-1$ is divided into squares of unit length by drawing parallel lines as shown in the diagram, then the number of rectangles possible with odd side lengths is fig a.$(m+n-1)^2$ b. 4^{m+n-1} c. m^2n^2 d. $m(m+1)n(n+1)$

A. m^2n^2

B. $mn(m+1)(n+1)$

C. 4^{m+n-1}

D. none of these

Answer:

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40. How many 5-letter words, with or without meaning, can be formed out of the letters of the word 'EQUATIONS' if repetition of tetters is not allowed ?

A. 126

B. 5^9

C. 9^5

D. 15120

Answer: D

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41. It is required to sent 7 men and 3 women in a row so that women occupy the even places. How many such arrangements are possible?

A. $\hat{} (5)C_3 \times 3! \times 7!$

B. $\hat{} (10)C_5 \times 5!$

C. $\hat{} (5)C_3 \times 10!$

D. none of these

Answer: A

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42. Suppose that six students, including Madhu and Puja, are having six beds arranged in a row. Further, suppose that Mudhu does not want a bed adjacent to Puja. Then the number of ways, the beds can be allotted to students is

A. 384

B. 264

C. 480

D. 600

Answer:

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43. How many different signals can be made by 5 flags from 8 flags of different colours?

A. $\hat{}\ (8)C_5$

B. $\hat{}\ (8)C_5 \times 5!$

C. 5^8

D. 8^5

Answer: B

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44. How many different signals can be given using any number of flags from 6 flags of different colours?

A. 720

B. 1440

C. 1956

D. 1950

Answer:

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45. Ten different letters of an alphabet are given. Words with five letters are formed from these given letters. Determine the number4 of words which have at least one letter repeated.

A. 10^5

B. 30240

C. 69760

D. none of these

Answer:

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46. The number of times the digit 3 will be written when listing the integers from 1 to 1000, is

A. 300

B. 297

C. 243

D. 273

Answer:

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47. A number of 18 guests have to be seated, half on each side of a long table. Four particular guests desire to sit on one particular side and three others on the other side. Determine the number of ways in which the sitting arrangements can be made.

A. $9! \times 9!$

B. ${}^{11}C_5 \times 9! \times 9!$

C. $\frac{11!}{5!} \times 9! \times 9!$

D. ${}^{11}C_5$

Answer:

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48. How many different words, each containing 2 vowels and 3 consonants can be formed with 5 vowels and 17 consonants?

A. ${}^5C_2 \times {}^{17}C_3$

B. $^{5}C_{2} \times 5!$

C. $^{17}C_{3} \times 5!$

D. $^{5}C_{2} \times {}^{17}C_{3} \times 5!$

Answer: D

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49. The number of integers greater than 6000 that can be formed using the digits 3,5,6,7 and 8 without repetition, is

A. 120

B. 72

C. 216

D. 192

Answer: D

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50. Find the sum of all the numbers that can be formed with the digits 2, 3, 4, 5 taken all at a time.

A. $(2+3+4+5) \times 3!$

B. $(2+3+4+5)\left(\frac{10^4-1}{10-1}\right)$

C. $(2+3+4+5) \times 3! \times \left(\frac{10^4-1}{10-1}\right)$

D. $\times 3! \times \left(\frac{10^4-1}{10-1}\right)$

Answer:

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51. The sum of all the numbers greater than 10000 formed by using digits 0, 2, 4, 6, 8, no digit being repeated in any numbers is,

A. $\frac{20}{9}(10^5 - 10^4)$

B. $\frac{40}{3}\{4(10^5 - 1) - (10^4 - 1)\}$

C. $\frac{20}{9}\{4(10^5 - 1) - (10^4 - 1)\}$

D. $20 \times 4!\left(\frac{10^5 - 1}{10 - 1}\right)$

Answer:

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52. A debate club consists of 6 girls and 4 boys. A team of 4 members is to be selected from this club including the selection of a captain (from among these 4 members) for the tem. If the team has to include at most one boy, then the number of ways of selecting the team is

A. 380

B. 320

C. 260

D. 95

Answer:

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53. There are three sections in a question paper, each containing 5 questions. A candidate has to solve any 5 questions, choosing at least one from each section. Find the number of ways in which the candidate can choose the questions.

A. ${}^{15}C_5$

B. ${}^{3}C_1 \times {}^{12}C_4$

C. 2250

D. 2253

Answer:

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54. Let $S = \{1, 2, 3; \cdot 9\}\dot{F}$ or $k = 1, 2, 5, letN_k$ be the number of subsets of S, each containing five elements out of which exactly k are odd. Then $N_1 + N_2 + N_3 + N_4 + N_5 = ?$ 210 (b) 252 (c) 125 (d) 126

A. 210

B. 252

C. 125

D. 126

Answer:

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55. On how many nights may a watch of 4 men be arranged by a security agency from a crew of 16 so that no two watches are identical. On how many of these nights would a particular person be off-duty ?

A. 1820

B. 455

C. 1365

D. none of these

Answer:

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56. A box contains 2 white balls, 3 black balls & 4 red balls. In how many ways can three balls be drawn from the box if atleast one black ball is to be included in draw (the balls of the same colour are different).

A. 84

B. 20

C. 64

D. 104

Answer: C

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57. How many diagonals are there in an n- sided polygen $(n > 3)$?

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

B. $\frac{n(n-3)}{2}$

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

D. none of these

Answer: B

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58. There are 10 points in a plane, no three of which are in the same straight line, except 4 points, which are collinear.

Find the number of lines obtained from the pairs of these points,

A. 40

B. 39

C. 45

D. none of these

Answer: A

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59. In a plane there are 37 straight lines, of which 13 passes through the point A and 11 passes through point B. Besides, no three lines passes through one point no line passes through both points A and B and no two are parallel, then find the number of points of intersection of the straight line.

A. 533

B. 535

C. ${}^{37}C_2 - {}^{24}C_2$

D. none of these

Answer:

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60. There are n points on the line AB and n points on the line AC, excluding the point A. Triangles are formed joining these points

(i) When point A is included

When point A is excluded .

The ratio of the number of such triangles is

A. $\frac{mn}{2}(m+n-2)$

B. $\frac{mn}{2}(m+n-1)$

C. $\frac{mn}{2}(m+n)$

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

Answer:

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61. let T_n be the number of all possible triangels formed by joining vertices of an n-sided regular polygon. Iff $T_{n+1}-T_n=10$, the value of n is

A. 7

B. 5

C. 10

D. 8

Answer: B

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62. In how many ways five different rings can be worn in four fingers with at least one ring in each finger?

A. 120

B. 96

C. 20

D. 480

Answer: D

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63. In how many ways five different rings can be put on four fingers with at least one ring on each finger?

A. 120

B. 480

C. 240

D. 960

Answer:

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64. Let A and B be two finite sets having m and n elements respectively. Then the total number of mappings from A to B is

A. n^m

B. ${}^nC_m$

C. ${}^nC_m \times m!$

D. m^n

Answer:

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65. Two different packs of cards are shuffled together. Cards dealt equally among 4 players, each getting 13 cards. The number of ways in which a player get his cards if no two cards are from the same suit with the same denomination is

A. ${}^{52}C_{13}$

B. 2^{13}

C. ${}^{52}P_{13}$

D. ${}^{52}C_{13} \times 2^{13}$

Answer:

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66. Prove that the no. of all permutations of n different objects taken r at a time when a particular object is to be always included in each arrangement is $r.\ (n-1)P_{r-1}$

A. ${}^{n}C_{r} \times r!$

B. ${}^{n-1}C_{r-1} \times (r-1)!$

C. ${}^{n-1}C_{r-1} \times r!$

D. ${}^{n-1}C_r \times r!$

Answer:

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67. The number of all permutations (arrangements) of n different objects taken at a time, when a particular object is to be always included in each arrangements is

A. ${}^{n-1}C_r \times (r-1)!$

B. ${}^{n-1}C_{r-1} \times r!$

C. ${}^{n-1}C_r \times r!$

D. ${}^{n}C_r \times r!$

Answer:

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68. Prove that the no. of permutations of n different objects taken r at a time in which two specified objects always occur together $2!(r-1)(n-2)P_{r-2}$

A. ${}^{n-2}C_{r-2} \times r!$

B. ${}^{n-2}C_{r} \times r! \times 2!$

C. ${}^{n-2}C_{r \quad 2} \times 2!$

D. ${}^{n-2}C_{r-2} \times (r-1)! \times 2$

Answer:

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69. m women and n men are too be seated in a row so that no two men sit together. If $m > n$ then show that the number of wys in which they can be seated is $\frac{m!(m+1)!}{(m-n+1)!}$

A. $\frac{(m!n!)!}{(m+n)!}$

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

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

D.

Answer: A

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70. The number of ways of arranging m white and n black balls in a row $(m > n)$ so that no two black are placed together, is

A. ${}^{m+1}C_n \times n!m!$

B. ${}^{m}C_n$

C. ${}^{m+1}C_n$

D. $m!n!$

Answer:

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71. Five boys and five girls form a line with the boys and girls alternating. Find the number of ways of making the line.

A. $(5!)^2$

B. $10!$

C. $5! + 5!$

D. $2(5!)^2$

Answer: D

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72. r

A. 4

B. 5

C. 6

D. 7

Answer:

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73. The number of natural numbers belonging to $(20000, 60000]$, whose sum of digits is even, is

A. 40000

B. 20000

C. 5000

D. 25000

Answer:

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74. The number of five digit telephone numbers having at least one of their digits repeated is 90000 b. 100000 c. 30240 d. 69760

A. 90000

B. 27216

C. 62784

D. 15120

Answer:

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75. At an election, a voter may vote for any number of candidates, not greater than number to be elected. There are 10 condidates and 4 are to be selected. If a voter votes for atleast one candidate, then number of ways in which he can vote, is

A. 5040

B. 6210

C. 385

D. 1110

Answer:

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76. The set $S = \{1, 2, 3, \ldots\ldots., 12)$ is to be partitioned into three sets A, B, C of equal size. Thus, $A \cup B \cup C = S, A \cap B = B \cap C = A \cap C = \varphi$. The number of ways to partition S is (1) $\frac{12!}{3!(4!)^3}$ (2) $\frac{12!}{3!(3!)^4}$ (3) $\frac{12!}{(4!)^3}$ (4) $\frac{12!}{(4!)^4}$

A. $\frac{12!}{(4!)^3}$

B. $\frac{12!}{(3!)^4}$

C. $\frac{12!}{3!(4!)^3}$

D. $\frac{12!}{3!(3!)^4}$

Answer:

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77. From 6 different novels and 3 different dictionaries, 4 novels annd 1 dictionary are to be selected and arranged in a row on a shelf so that the dictionary is always in the middle. Then, the number of such arrangements is

A. less than 500

B. at least 500 but less than 750

C. at least 750 but less than 1000

D. at least 1000

Answer:

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78. A man X has 7 friends, 4 of them are ladies and 3 are men. His wife Y also has 7 friends, 3 of them are ladies and 4 are men. Assume X and Y has no common friends. Then the total number of ways in which X and Y together can throw a party inviting 3 ladies annd 3 men, so that 3 friends of each of X and Y are in this party, is

A. 485

B. 468

C. 469

D. 484

Answer:

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79. How many different words can be formed with the letters of the word MISSISSIPPI?

A. $\frac{11!}{4!4!2!}$

B. $\frac{11!}{4!4!}$

C. $\frac{11!}{4!2!}$

D. none of these

Answer: A

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80. How many different words can be formed by using all the letters of the word ALLAHABAD?

A. 30

B. (9!)

C. (9!)/(2!)

D. (9!)/(2! 4!)

Answer: D

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81. The number of arrangements that can be made with the letters of the word 'MATHEMATICS' in which all vowels comes together, is

A. $\frac{8! \times 4!}{2!2!}$

B. $\frac{8! \times 4!}{2!2!2!}$

C. $\frac{8!}{2!2!2!}$

D. $\frac{8!}{4!2!2!}$

Answer: B

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82. If all the letters of the word AGAIN be arranged as in a dictionary, what is the fiftieth word?

A. NAAGI

B. NAAIG

C. NIAAG

D. NAIAG

Answer:

Watch Video Solution

83. If the letters of the word SACHIN are arranged in all possible ways and these words are written out as in dictionary, then the word SACHIN appears at serial number 602 (2) 603 (3) 600 (4) 601

A. 602

B. 603

C. 600

D. 601

Answer:

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84. The letters of the word COCHIN are permuted and all the permutations are arranged in an alphabetical order s in an

English dictionary. The number of words that appear before the word COCHIN is a.360 b. 192 c. 96 d. 48

A. 360

B. 192

C. 96

D. 48

Answer:

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85. If all the words (with or without meanining having five letters, formed usingg the letters of the word SMAL and arranged as in a dictionary, then the position of the word SMALL is

A. 46^{th}

B. 59^{th}

C. 52^{th}

D. 58^{th}

Answer:

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86. how may four letter words can be formed uysing het letters of the word FAILURE so that F is included in each word? F is not include in any word?

A. ${}^{6}C_{4} \times 4!$

B. ${}^{6}C_{3} \times 4!$

C. ${}^{6}C_{4}$

D. ${}^6C_4 \times 3!$

Answer: B

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87. How many five letter words containing 3 vowels and 2 consonants can be formed using the letters of the word EQUATION so that the two consonants occur together?

A. 720

B. 1440

C. 240

D. 480

Answer: B

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88. about to only mathematics

A. ${}^{8}C_5 \times 5!$

B. ${}^{7}C_5 \times 5!$

C. ${}^{8}C_5$

D. $7!$

Answer: C

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89. The number of ways in which four S come consecutively in the word MSSISSIPPI, is

A. 420

B. 840

C. 210

D. 630

Answer: D

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90. The number of ways in which four different letters can be put in the correspondingly four addressed envelopes so that no letters are put in the correct envelope, is

A. 6

B. 7

C. 8

D. 9

Answer:

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91. If the 13 letter words (need no be meaningful) are to be formed using the letters from the word "MEDITERRANEAN" such that the first letter is R and the fourth letter is, E, then the total number of such words, is

A. $\frac{11!}{(2!)^3}$

B. 59

C. 110

D. 56

Answer:

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92. In how many ways, 20 guests and 1 host can be arranged around a circular table so that two particular guests are on either side of the host?

A. 18!

B. $18! \times 2!$

C. $\frac{18!}{2!}$

D. 19!

Answer: B

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93. There are 20 persons among whom are two brothers. The number of ways in which we can arrange them around a circle so that there is exactly one person between the two brothers, is

A. 18!

B. $17! \times 2!$

C. $18! \times 2!$

D. 20!

Answer: C

Watch Video Solution

94. There are 5 gentlemen and 4 ladies to dine at a round table. In how many ways can they as themselves so that no that ladies are together ?

A. 2880

B. 576

C. 1440

D. 480

Answer: A

Watch Video Solution

95. In how many ways can 7 persons sit around a table so that all shall not have the same neighbours in any two arrangements.

A. 720

B. 360

C. 1440

D. none of these

Answer:

Watch Video Solution

96. Ramesh has 6 friends. In how many ways can be invite one or more of them at a dinner ?

A. 64

B. 65

C. 63

D. 6!

Answer: C

Watch Video Solution

97. Find the total number of factors of 2160 (excluding 1)

A. 40

B. 39

C. 41

D. 38

Answer:

Watch Video Solution

98. no of proper diviser of 7875...

A. 23

B. 24

C. 22

D. 21

Answer:

Watch Video Solution

99. The number of factors (excluding 1 and the expression itself) of the product of $a^7b^4c^3$ def, where a, b, c, d, e, fare all prime numbers, is

A. 1279

B. 1278

C. 1280

D. 1277

Answer:

Watch Video Solution

100. The number of even divisors of 10800 is (a) 16 (c) 36 (b) 31 (d) 48

A. 12

B. 24

C. 36

D. 48

Answer:

Watch Video Solution

101. The number of divisors of the form $(4n+2)$ of the integer 240 is

A. 4

B. 8

C. 10

D. 3

Answer:

Watch Video Solution

102. The number of divisors of 10800 which are divisible by 15, is

A. 10

B. 20

C. 15

D. 30

Answer:

Watch Video Solution

103. If r,s,t are prime numbers and p,q are the positive integers such that LCM of p,q, is $r^2t^4s^2$, then the

A. 252

B. 254

C. 225

D. 224

Answer:

Watch Video Solution

104. (i) In how many ways can a pack of 52 cards be divided equally among four players? (ii) (ii) In how many ways can you divide these cards in four sets, three of them having 17 cards each and the four the one just one card?

A. $\frac{52!}{(13!)^4}$

B. $\frac{52!}{(13!)^4 4!}$

C. $\frac{52!}{13!}$

D. $\frac{52!}{4! \times 13!}$

Answer:

Watch Video Solution

105. Find the number of ways of dividing 52 cards amongst four players equally.

A. $\frac{52!}{(13!)^4}$

B. $\frac{52!}{(13!)^4 4!}$

C. $\frac{52!}{(13!)^4 \times 4}$

D. $\frac{52!}{13! \times 4}$

Answer: B

Watch Video Solution

106. (i) In how many ways can a pack of 52 cards be divided equally among four players? (ii) (ii) In how many ways can you divide these cards in four sets, three of them having 17 cards each and the four the one just one card?

A. $\dfrac{52!}{(17!)^3 3!}$

B. $\dfrac{52!}{(17!)^3}$

C. $\dfrac{52!}{51!(17!)^3}$

D. $\dfrac{52!}{51!}$

Answer:

Watch Video Solution

107. The total number of ways in which 30 mangoes can be distributed among 5 persons is

A. ${}^{30}C_5$

B. 30^5

C. 5^{30}

D. ${}^{34}C_4$

Answer:

Watch Video Solution

108. The number of ways of distributing 5 identical balls in into three boxes so that no box is empty (each box being large enough to accommodate all balls), is

A. 3^5

B. 5^3

C. 15

D. 6

Answer: D

Watch Video Solution

Watch Video Solution

109. In how many ways can 20 identical toys be distributed among 4 children so that each one gets at least 3 toys?

A. ${}^{11}C_2$

B. ${}^{12}C_3$

C. ${}^{11}C_3$

D. ${}^{12}C_4$

Answer: C

Watch Video Solution

110. Determine the total number of nono-negative integral solutions of $x_1 + x_2 + x_3 + x_4 = 100$,

A. ${}^{100}C_3$

B. ${}^{99}C_3$

C. ${}^{100}C_4$

D. ${}^{99}C_4$

Answer:

Watch Video Solution

111. How many integral solutions are there to x+y+z+t=29, when $x \geq 1, y > 1, z \geq 3$ and $t \geq 0$?

A. ${}^{26}C_4$

B. ${}^{26}C_3$

C. ${}^{22}C_3$

D. ${}^{29}C_3$

Answer:

Watch Video Solution

112. The number of ways in which 16 sovereigns can be distrbuted among three applicants such that each applicant does not receive less than 3 sovereigns, is

A. ${}^{16}C_3$

B. ${}^{9}C_2$

C. ${}^{9}C_3$

D. ${}^{10}C_2$

Answer:

Watch Video Solution

Watch Video Solution

113. The number of points, having both co-ordinates as integers, that lie in the interior of the triangle with vertices $(0, 0), (0, 41)$ and $(41, 0)$ is

A. 820

B. 780

C. 901

D. 861

Answer:

Watch Video Solution

114. How many integral solutions are there to the system of equations

$x_1 + x_2 + x_3 + x_4 + x_5 = 20$ and $x_1 + x_2 + x_3 = 5$ when $x_k \geq 0$?

A. 335

B. 336

C. 338

D. 340

Answer:

Watch Video Solution

115. In how many ways can four people, each throwing a dice once, make a sum of 6?

A. ${}^{9}C_{2}$

B. ${}^{10}C_{3}$

C. ${}^{8}C_{3}$

D. ${}^{9}C_{3}$

Answer:

Watch Video Solution

116. In how many ways can four persons each throwing a dice, once, make a sum of 13 ?

A. 220

B. 180

C. 140

D. 80

Answer: C

Watch Video Solution

117. Between two junction stations A and B there are 12 intermediate stations. The number of ways a train can be made to stop at 4 of these stations so that no two of these halting station are consecutive is

A. ${}^{9}C_{5}$

B. ${}^{9}C_{4}$

C. ${}^{10}C_{4}$

D. ${}^{10}C_{5}$

Answer:

Watch Video Solution

118. The number of ways in which 5 letters can be placed in 5 marked envelopes, so that no letter is in the right encelope, is

A. 45

B. 44

C. 43

D. 46

Answer: B

Watch Video Solution

119. Ravish writes letters to his five friends and addresses the correspondig envelopes. The total number of ways in which letters can be placed in the envelopes so that at least two of them are in the wrong envelopes, is

A. 120

B. 118

C. 119

D. 121

Answer:

Watch Video Solution

Section I Solved Mcqs

1. If $n = {}^{m}C_2$ the valuen of ${}^{n}C_2$ is given by

A. ${}^{m+1}C_4$

B. ${}^{m-1}C_4$

C. ${}^{m+2}C_4$

D. none of these

Answer:

Watch Video Solution

2. If $(n-1)C_r = (k^2-3)nC_{r+1}$,then k belong to

A. $(-\infty, -2]$

B. $(2, \infty]$

C. $[-\sqrt{3}, \sqrt{3}]$

D. $(\sqrt{3}, 2]$

Answer:

Watch Video Solution

3. The sum $\sum_{i=0}^{m} ((10)c, (i))\binom{20}{m-1}$, where $\binom{p}{q} = 0$ if $p < q$, is maximum when m is equal to (A) 5 (B) 10 (C) 15 (D) 20

A. 5

B. 10

C. 15

D. 20

Answer:

Watch Video Solution

4. The exponent of 7 in 100!, is

A. 14

B. 15

C. 16

D. none of these

Answer:

Watch Video Solution

5. The number of zeros at the end of 100!, is

A. 24

B. 51

C. 10

D. 70

Answer: A

Watch Video Solution

6. The number of 24! Is divisible by

A. 6^{24}

B. 24^{6}

C. 12^{12}

D. 48^{5}

Answer: B

Watch Video Solution

7. If a and b are the greatest values of ${}^{2n}C_r$ and ${}^{2n-1}C_r$ respectively. Then,

A. a=2b

B. b-2a

C. a=b

D. none of these

Answer:

Watch Video Solution

8. Find the total number of ways in which n distinct objects can be put into two different boxes.

A. n^2

B. 2^n

C. 2n

D. none of these

Answer:

Watch Video Solution

9. Find the total number of ways in which n distinct objects can be put into two different boxes.

A. $2^n - 1$

B. $n^2 - 1$

C. $2^n - 2$

D. $n^2 - 2$

Answer:

Watch Video Solution

10. Find the number of ways in which n distinct objects can be kept into two identical boxes so that no box remains empty.

A. $2^n - 2$

B. $2^n - 1$

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

D. $2^n - 1$

Answer:

Watch Video Solution

11. Find the number of ways in which 8 distinct toys can be distributed among 5 children.

A. 5^8

B. 8^5

C. 3^5

D. none of these

Answer: A

Watch Video Solution

12. The number of 6-digit numbers that can be formed using the three digits 0,1 and 2, is

A. 3^6

B. 2×3^5

C. 3^5

D. none of these

Answer: C

Watch Video Solution

13. No. of different matrices that can be formed with elements $0, 1, 2 \text{ or } 3$ each matrix having 4 elements is

A. 3×2^4

B. 2×4^4

C. 3×4^4

D. none of these

Answer:

Watch Video Solution

14. The number of possible outcomes in a throw of n ordinary dice in which at least one of the die shows and odd number is a. 6^n-1 b. 3^n-1 c. 6^n-3^n d. none of these

A. 6^n-1

B. 3^n-1

C. 6^n-3^n

D. none of these

Answer:

Watch Video Solution

Watch Video Solution

15. Find the number of distinct rational numbers x such that $o < x < 1 and x = p/q$, where $p, q \in \{1, 2, 3, 4, 5, 6\}$.

A. 15

B. 13

C. 12

D. 11

Answer:

Watch Video Solution

16. The number of signals that can be generated by using 6 differently coloured flags, when any number of them may be hoisted at a time is

A. 1956

B. 1957

C. 1958

D. 1959

Answer: A

Watch Video Solution

17. The sum of all five digit numbers that can be formed using the digits 1 , 2 , 3 , 4 ,5 when repetition of digits is not allowed is

A. 366000

B. 660000

C. 360000

D. 3999960

Answer:

Watch Video Solution

18. The number of 6 digit numbers that can be made with the digits 0,1,2,3,4 and 5 so that even digits occupy odd places is

A. 24

B. 36

C. 48

D. none of these

Answer:

Watch Video Solution

19. Seven different lecturers are to deliver lectures in seven perday. A, B and C are three oftne lectures. The number of ways in which a routine for theday canr be made such that A delivers his lecture before B and B before C, is

A. 420

B. 120

C. 210

D. none of these

Answer:

Watch Video Solution

20. The number of arrangements of the letters of the word BANANA in which the two N's do not appear adjacently is a. 40 b. 60 c. 80 d. 100

A. 40

B. 60

C. 80

D. 100

Answer: A

Watch Video Solution

21. The total number of five-digit numbers of different digits in which the digit in the middle is the largest is a. $\sum_{n=4}^{9} \hat{} \, nP_4$ b.

$33(3!)$ c. $30(3!)$ d. none of these

A. $30 \times 30!$

B. $33 \times 3!$

C. $\sum_{n=4}^{9} {}^{n}C_{4} \times 4!$

D. none of these

Answer:

Watch Video Solution

22. How many different nine-digit numbers can be formed from the digits of the number 223355888 by rearrangement of the digits so that the odd digits occupy even places:

A. 16

B. 36

C. 60

D. 180

Answer:

Watch Video Solution

23. By using the digits 0,1,2,3,4 and 5 (repetitions not allowed) numbers are formed by using any number of digits. Find the total number of non-zero number that can be formed.

A. 1030

B. 1630

C. 1200

D. 1530

Answer:

Watch Video Solution

24. The total number not more than 20 digits that are formed by usingd the digits 0, 1, 2, 3, and 4 is a. 5^{20} b. $5^{20}-1$ c. $5^{20}+1$ d. none of these

A. 5^{20}

B. $5^{20}-1$

C. $5^{20}+1$

D. none of these

Answer:

Watch Video Solution

25. Six boys and six girls sit along a line alternately in x ways, and along a circle (again alternatively in y ways), then

A. x=y

B. y=12x

C. x=10y

D. x=12y

Answer: D

Watch Video Solution

26. The number of times the digit 3 will be written when listing the integers from 1 to 1000, is

A. 269

B. 300

C. 271

D. 302

Answer:

Watch Video Solution

27. Let T_n denote the number of triangles, which can be formed using the vertices of a regular polygon of n sides. It $T_{n+1} - T - n = 21, the \cap$ equals a.5 b. 7 c. 6 d. 4

A. 5

B. 7

C. 6

D. 4

Answer:

Watch Video Solution

28. Let A be the set of all positive prime intergers less than 30. The number of different rational numbers whose numerator and denominator belong to A is

A. 90

B. 180

C. 91

D. none of these

Answer:

Watch Video Solution

29. find the number of ways in which a mixed double game can be arranged from amongst 9 married couples if no husband and wife play in the same game.

A. 756

B. 1512

C. 3024

D. none of these

Answer:

Watch Video Solution

30. The number of different seven-digit numbers that can be written using only the three digits 1, 2, and 3 with the condition that the digit 2 occurs twice in each number is a. ^ $2P_5 2^5$ b. ^ $7C_2 2^5$ c. ^ $7C_2 5^2$ d. none of these

A. ${}^7P_5.2^5$

B. ${}^7C_2.2^5$

C. ${}^7C_2.5^2$

D. none of these

Answer:

Watch Video Solution

31. The number of six digit numbers that can be form from the digit 1,2,3,4,5,6 and 7 . So that the digit do not repeat and the terminal digits are even is

A. 144

B. 72

C. 288

D. 720

Answer: D

Watch Video Solution

32. N a certain test, there are n question. In the test, 2^{n-i} students gave wrong answers to at least i questions, where $i = 1, , 2; n.$ if the total number of wring answers given is 2047, then n is equal to a. 10 b. 11 c. 12 d. 13

A. 10

B. 11

C. 12

D. 13

Answer:

Watch Video Solution

33. The total number of 4 digit numbers in which the digit are in descending order, is

A. ${}^{10}C_4 \times 4!$

B. ${}^{10}C_4$

C. $\dfrac{10!}{4!}$

D. none of these

Answer: B

Watch Video Solution

34. The number of words of four letters containing equal number of vowels and consonants, where repetition is allowed, is a. 105^2 b. 210×243 c. 105×243 d. 150×21^2

A. 105^2

B. 210×243

C. 105×243

D. none of these

Answer:

Watch Video Solution

35. The number of 6-digit numbers that can be made with the digits 1, 2, 3 and 4 and having exactly two pairs of digits is:

A. 480

B. 540

C. 1080

D. none of these

Answer:

Watch Video Solution

36. The number of six-digit numbers all digits of which are odd, is ....

A. $\frac{5}{2} \times 6!$

B. 6!

C. $\frac{1}{2} \times 6!$

D. none of these

Answer:

Watch Video Solution

37. The number of numbers divisible by 3 that can be formed by four different even digits, is

A. 18

B. 36

C. 24

D. 48

Answer:

Watch Video Solution

38. The number of five digit even numbers that can be made with the digits, 0, 1, 2 and 3, is

A. 384

B. 192

C. 768

D. 576

Answer:

Watch Video Solution

39. Given that n is odd, number of ways in which three numbers in AP can be selected from 1, 2, 3,......., n, is

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

B. $\frac{(n+1)^2}{4}$

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

D. $\frac{(n-1)^2}{4}$

Answer:

Watch Video Solution

40. One and only one straight line can be drawn passing through two given points and we can draw only one triangle through non-collinear points. By integral coordinates (x,y) of a point we mean both x and y as integers .

The number of triangles whose vertices are the vertices of an octagon but none of whose sides happen to be come from the octagon is

A. 24

B. 52

C. 48

D. 16

Answer:

Watch Video Solution

41. There are 10 points in a plane of which no three points are collinear and four points are concyclic. The number of different circles that can be drawn through at least three points of these points is a. 116 b. 120 c. 117 d. none of these

A. 116

B. 117

C. 120

D. none of these

Answer:

Watch Video Solution

42. There are three coplanar parallel lines. If any p points are taken on each of the lines, the maximum number of triangles with vertices on these points is a. $3p^2(p-1)+1$ b. $3p^2(p-1)$ c. $p^2(4p-3)$ d. none of these

A. $3n^2(n-1)$

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

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

D. none of these

Answer:

Watch Video Solution

43. In a polygon no three diagonals are concurrent. If the total number of points of intersection of diagonals interior to the polygon be 70, then the number of diagonals of the polygon, is

A. 8

B. 20

C. 28

D. none of these

Answer:

Watch Video Solution

44. ABCD is a convex quadrilateral and 3, 4, 5, and 6 points are marked on the sides AB, BC, CD, and DA, respectively. The number of triangles with vertices on different sides is a. 270 b. 220 c. 282 d. 342

A. 220

B. 270

C. 282

D. 342

Answer:

Watch Video Solution

45. The number of ways in which we can select four numbers from 1 to 30 so as to exclude every selection of four consecutive numbers is a. 27378 b. 27405 c. 27399 d. none of these

A. 27378

B. 27405

C. 27399

D. none of these

Answer:

Watch Video Solution

46. The number of four-digit numbers that can be made with the digits 1, 2, 3, 4, and 5 in which at least two digits are identical is a. $4^5 - 5!$ b. 505 c. 600 d. none of these

A. $4^5 - 5!$

B. 505

C. 600

D. none of these

Answer:

Watch Video Solution

47. The number of 5-digit number that can be made using the digits 1 and 2 and in which at laest one digits is different, is

A. 30

B. 31

C. 32

D. none of these

Answer:

Watch Video Solution

48. The number of ways of dividing 20 persons into 10 couples is

A. $\frac{20!}{2^{10}10!}$

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

C. $\frac{20!}{(21!)^9}$

D. (20!)/(2^(10)

Answer: A

Watch Video Solution

49. Find the number of ways in which 10 condidates $A_1, A_2, \ldots\ldots, A_{10}$ can be ranked so that A_1 is always above A_2,

A. 10!

B. $\frac{10!}{2}$

C. 9!

D. none of these

Answer:

Watch Video Solution

50. There are n white and n black balls marked 1, 2, 3,.....,n. The number of ways in which we can arrange these balls in a row so that neighbouring balls are of different colours, is

A. n!

B. (2n)!

C. $2(n!)^2$

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

Answer:

Watch Video Solution

51. The number of ways in which we can distribute mn students equally among m sections is given by a. $\frac{(mn!)}{n!}$ b. $\frac{(mn)!}{(n!)6m}$ c. $\frac{(mn)!}{m!n!}$ d. (mn^m)

A. $\frac{(mn)!}{n!}$

B. $\frac{(mn)!}{(n!)^m}$

C. $\frac{(mn)!}{m!n!}$

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

Answer:

Watch Video Solution

52. The total number of 6-digit numbers in which the sum of the digits is divisible by 5, is

A. 180000

B. 540000

C. 5×10^5

D. none of these

Answer: A

Watch Video Solution

53. The number of integers solutions for the equation $x + y + z + t = 20$, where x,y,z t are all $\geq\ - 1$, is

A. ${}^{20}C_4$

B. ${}^{23}C_3$

C. ${}^{27}C_4$

D. ${}^{27}C_3$

Answer: D

Watch Video Solution

54. The number of integral solutions of $x+y+z=0$ with $x \geq -5, y \geq -5, z \geq -5$ is a. 134 b. 136 c. 138 d. 140

A. 135

B. 136

C. 455

D. 105

Answer: B

Watch Video Solution

55. The number of non-negative integral solutions of $x+y+z \leq n$, where $n \in N$ is

A. ${}^{n+3}C_3$

B. ${}^{n+4}C_4$

C. ${}^{n+5}C_5$

D. none of these

Answer:

Watch Video Solution

56. If n objects are arrange in a row, then the number of ways of selecting three of these objects so that no two of them are next to each other is

A. ${}^{n-2}C_3$

B. ${}^{n-3}C_2$

C. ${}^{n-3}C_3$

D. none of these

Answer:

Watch Video Solution

57. There are three piles of identical red, blue and green balls and each pile contains at least 10 balls. The number of ways of selecting 10 balls if twice as many red balls as green balls are to be selected, is

A. 3

B. 4

C. 6

D. 8

Answer:

Watch Video Solution

58. If n objects are arrange in a row, then the number of ways of selecting three of these objects so that no two of them are next to each other is

A. ${}^{n-3}C_3$

B. ${}^{n-3}C_2$

C. ${}^{n-2}C_3$

D. none of these

Answer:

Watch Video Solution

59. Between two junction stations A and B there are 12 intermediate stations. The number of ways a train can be made to stop at 4 of these stations so that no two of these halting station are consecutive is

A. ${}^{8}C_4$

B. ${}^{9}C_4$

C. ${}^{12}C_4 - 4$

D. none of these

Answer:

Watch Video Solution

60. In how many ways can 30 marks be allotted to 8 question if each question carries at least 2 marks?

A. ${}^{21}C_7$

B. ${}^{21}C_8$

C. ${}^{21}C_9$

D. none of these

Answer:

Watch Video Solution

61. The number of points in space, whose each co-ordinate is a negative integer such that $x + y + z + 12 = 0$

A. 385

B. 55

C. 110

D. none of these

Answer:

Watch Video Solution

62. If x,y,z is integer and $x \geq 0, y \geq 1, z \geq 2, x + y + z = 15$ then the number of values of the ordered triplet (x,y,z) is

A. 91

B. 455

C. ${}^{17}C_{15}$

D. none of these

Answer:

Watch Video Solution

63. If a, b, c, are natural numbers in AP and then the possible number of values of the ordered triplet (a, b, c) is:

A. 15

B. 14

C. 13

D. none of these

Answer:

Watch Video Solution

64. If x, y, z, t are odd natural numbers such that $x + y + z + w = 20$ then find the number of values of ordered quadruplet (x, y, z, t).

A. 165

B. 455

C. 310

D. none of these

Answer:

Watch Video Solution

Watch Video Solution

65. The number of ways in which a score of 11 can be made from a through three persons, each throwing a single die once, is

A. 45

B. 18

C. 27

D. none of these

Answer: C

Watch Video Solution

66. The sum of all the numbers of four different digits that can be made by using the digits 0, 1, 2, and 3 is a. 26664 b. 39996 c.

38664 d. none of these

A. 26664

B. 39996

C. 38664

D. none of these

Answer:

Watch Video Solution

67. There are 5 mangoes, 3 oranges and 4 bananas. The number of ways of selecting at least one fruit of each kind, is

A. $\frac{5!}{2!}$

B. 5!

C. 5!-4!

D. 3!

Answer: A

Watch Video Solution

68. There are 4 mangoes, 3 apples, 2 oranges and 1 each of 3 other varieties of fruits. The number of ways of selecting at least one fruit of each kind, is

A. 10!

B. 9!

C. 4!

D. none of these

Answer:

Watch Video Solution

69. The number of divisor of 4200, is

A. 42

B. 48

C. 54

D. none of these

Answer: B

Watch Video Solution

70. The number of proper divisors of 2520, is

A. 46

B. 52

C. 64

D. none of these

Answer: A

Watch Video Solution

71. The number of porper divisors of $2^m \times 6^n \times 15^p$, is

A. $(m+n+1)(n+p+1)(p+1)$

B. $(m+n+1)(n+p+1)(p+1) - 2$

C. $(m+n)(n+p) - 2$

D. none of these

Answer:

Watch Video Solution

72. The number of proper divisors of 1800, which are also divisible by 10, are: a. 18 b. 27 c. 34 d. 43

A. 18

B. 34

C. 17

D. none of these

Answer: C

Watch Video Solution

73. The number of even proper divisors of 5040, is

A. 48

B. 47

C. 46

D. none of these

Answer: B

Watch Video Solution

74. The number of odd proper divisors of 5040, is

A. 12

B. 10

C. 11

D. none of these

Answer:

Watch Video Solution

75. Find the number of odd proper divisors of $3^p \times 6^m \times 21^n$.

A. $(m+1)(n+1)(p+1)-1$

B. $(m+n+p+1)(p+1)-1$

C. $(m+1)(n+1)(p+1)-2$

D. none of these

Answer:

Watch Video Solution

76. The number of divisors of the form $4K+2, K \geq 0$ of the integers 240 is

A. 4

B. 8

C. 10

D. 3

Answer: A

Watch Video Solution

77. The number of divisors of $2^4.3^3.5^2$, having two prime factors, is

A. 3

B. 24

C. 26

D. 60

Answer:

Watch Video Solution

78. There are five balls of different colours and five boxes of colours same as those of the balls. The number of ways in which the balls, one each in a box, could be placed such that exactly one ball goes to a box of its own colour, is

A. 9

B. 24

C. 45

D. 120

Answer:

Watch Video Solution

79. The number of 5-digit numbers in which no two consecutive digits are identical, is

A. $9^2 \times 8^3$

B. 9×8^4

C. 9^5

D. none of these

Answer: C

Watch Video Solution

80. Let A be a set of $n(\geq 3)$ distinct elements. The number of triplets (x,y,z) of the set A in which atleast two coordinates are equal to

A. ${}^{n}C_3 \times 3!$

B. $n^3 - {}^{n}C_3 \times 3!$

C. $3n^2 - 2n$

D. $3n^2(n-1)$

Answer:

Watch Video Solution

81. Find the number of ways to give 16 different things to three persons A, B, C so that B gets 1 more than A and C gets 2 more than B.

A. $\frac{16!}{4!5!7!}$

B. 4!5!7!

C. $\frac{16!}{3!5!8!}$

D. none of these

Answer:

Watch Video Solution

82. If $P_1, P_2, P_3, \ldots\ldots, P_{m+1}$ are distinct prime numbers. Then the number of factors of $P_1^n P_2 P_3 \ldots\ldots P_{m+1}$ is :

A. $m(n+1)$

B. $2^n m$

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

D. $n.2^{m}$

Answer:

Watch Video Solution

83. There are n different books and p copies of each in a library. The number of ways in which one or more books can be selected is:

A. $m^{n}+1$

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

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

D. m

Answer: B

Watch Video Solution

84. The number of ways in which one or more balls can be selected out of 10 whit, 9 green and 7 blue balls, is

A. 892

B. 881

C. 891

D. 879

Answer: D

Watch Video Solution

85. The number of all three element subsets of the set $\{a_1, a_2, a_3......a_n\}$ which contain a_3 , is

A. ${}^nC_3$

B. ${}^{n-1}C_3$

C. ${}^{n-1}C_2$

D. none of these

Answer:

Watch Video Solution

86. If one quarter of all three element subsete of the set $A = \{a_1, a_2, a_3, ..., a_n\}$ contains the element a_3, then n=

A. 10

B. 12

C. 14

D. none of these

Answer:

Watch Video Solution

87. The sum of the divisors of $2^5 \cdot 3^4 \cdot 5^2$ is

A. $3^2.7^1.11^2$

B. $3^2.7^1.11^2.31$

C. $3.7.11.31$

D. none of these

Answer: B

Watch Video Solution

88. The number of words that can be made by writing down the letters of the word 'CALCULATE' such that each word starts and ends with a consonant, is

A. $\frac{5 \times 7!}{2}$

B. $\frac{3 \times 7!}{2}$

C. $2 \times 7!$

D. none of these

Answer:

Watch Video Solution

89. Find the number of ways in which n different prizes can be distributed among `m(

A. $n^m - n)$

B. m^n

C. mn

D. none of these

Answer:

Watch Video Solution

90. The total number of positive integral solutions for (x, y, z) such that $xyz = 24$ is

A. 36

B. 90

C. 120

D. none of these

Answer:

Watch Video Solution

91. The total number of positive integral solutions of abc=30, is

A. 30

B. 27

C. 8

D. none of these

Answer: B

Watch Video Solution

92. The total numbre of intergral solutins of abc =24, is

A. 36

B. 90

C. 120

D. 30

Answer:

Watch Video Solution

93. A bag contains 3 black, 4 white and 2 red balls, all the balls being different. The number of selections of at most 6 balls containing balls of all the colours, is

A. $42 \times 4!$

B. $2^6 \times 4!$

C. $(2^6 - 1)4!$

D. none of these

Answer:

Watch Video Solution

94. The number of different pairs of words (,) that can be made with the letters of the word STATICS, is

A. 828

B. 1260

C. 396

D. none of these

Answer:

Watch Video Solution

95. In the decimal system of numeration the number of 6-digit numbers in which the digit in any place is greater than the digit to the left of it, is

A. 210

B. 84

C. 126

D. none of these

Answer:

Watch Video Solution

Watch Video Solution

96. There are 60 questions in a question paper. If no two students solve the same combination of questions but solve equal number of questions, then the maximum number of student who appeared in the examination, is

A. ${}^{60}C_{29}$

B. ${}^{60}C_{30}$

C. ${}^{60}C_{50}$

D. none of these

Answer:

Watch Video Solution

97. An n-digit number is a positive number with exactly n digits. Nine hundred distinct n-digit numbers are to be formed using only the three digits 2, 5, and 7. The smallest value of n for which this is possible is a.6 b. 7 c. 8 d. 9

A. 6

B. 7

C. 8

D. 9

Answer:

Watch Video Solution

98. How many ways are there to arrange the letters in the word GARDEN with the vowels in alphabetical order?

A. 480

B. 240

C. 360

D. 120

Answer: C

Watch Video Solution

99. The number of ways of distributing 8 identical balls in 3 distinct boxes so that none of the boxes is empty is

A. ${}^{8}C_{3}$

B. 21

C. 3^{8}

D. 5

Answer: B

Watch Video Solution

100. The number of seven-digit numbers, with sum of the digits equal to 10 and formed by using the digits 1, 2 and 3 only, is:

A. 55

B. 66

C. 77

D. 88

Answer:

Watch Video Solution

101. Consider all possible permutations of the letters of the word $ENDEANOEL$. The number of permutations containing the word ENDEA is

A. $5!$

B. $2 \times 5!$

C. $7 \times 5!$

D. $21 \times 5!$

Answer:

Watch Video Solution

102. Consider all possible permutations of the letters of the word ENDEANOEL. The number of permutations in which the letter E occurs in the first and last positions is

A. $5!$

B. $2 \times 5!$

C. $7 \times 5!$

D. $21 \times 5!$

Answer:

Watch Video Solution

103. Consider all possible permutations of the letters of the word ENDEANOEL. The number of permutations in which none of the letters D, L and N occurs in the last positions is

A. $5!$

B. $2 \times 5!$

C. $7 \times 5!$

D. $21 \times 5!$

Answer:

Watch Video Solution

104. All possible permutations of the letters of the word ENDEANOEL if A, E, O occur only in odd positions is

A. 5!

B. $2 \times 5!$

C. $7 \times 5!$

D. $21 \times 5!$

Answer: B

Watch Video Solution

105. If ${}^{m}C_r = 0$ for $r > m$ then the sum $\sum_{r=0}^{m} {}^{18}C_r {}^{20}C_{m-r}$ is maximum when m =

A. 20

B. 19

C. 10

D. 10

Answer:

Watch Video Solution

106. Let $S = \{1, , 2, 34\}$. The total number of unordered pairs of disjoint subsets of S is equal a.25 b. 34 c. 42 d. 41

A. 25

B. 34

C. 42

D. 41

Answer:

Watch Video Solution

107. There are two urns. Urn A has 3 distinct red balls and urn B has 9 distinct blue balls. From each urn, two balls are taken out at random and then transferred to the other. The number of ways in which this can be done. Is

A. 66

B. 108

C. 3

D. 36

Answer:

Watch Video Solution

108. There are 10 points in a plane , out of these 6 are collinear .if N is number of triangles formed by joining these points , then

A. $100 < N \leq 140$

B. $140 < N \leq 190$

C. $N < 190$

D. $N \leq 100$

Answer:

Watch Video Solution

109. The total number of ways in which 5 balls of different colours can be distributed among 3 persons, so that each person gets atleast one ball is

A. 75

B. 150

C. 210

D. 243

Answer: B

Watch Video Solution

110. There are 10 girls and 8 boys in a class room including Mr. Ravi, Ms. Rani and Ms. Radha. A list of speakers consisting of 8 girls and 6 boys has to be prepared. Mr. Ravi refuses to speak if Ms. Rani is a speaker. Ms. Rani refuses to speak if Ms. Radha is a speaker. The number of ways the list can be prepared is a 3 digit number $n_1n_2n_3$, then $|n_3 + n_2 - n_1| =$

A. 202

B. 308

C. 567

D. 952

Answer:

Watch Video Solution

111. The number of words which can be formed out of the letters $a, b, c, d, e\ f$ taken 3 together, each word containing one vowel at least is

A. 128

B. 24

C. 72

D. 96

Answer: D

Watch Video Solution

Section Ii Assertion Reason Type

1. Statement-1: The number of zeros at the end of 100! Is, 24.

Statement-2: The exponent of prine p in n!, is

$$\left[\frac{n}{p}\right] + \left[\frac{n}{p^2}\right] + \dots\dots + \left[\frac{n}{p^r}\right]$$

Where r is a natural number such that $P^r \leq n < P^{r+1}$.

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

Watch Video Solution

2. In a shop there are five types of ice-creams available. A child buys six ice-creams. Statement -1: The number of different ways the child can buy the six ice-creams is $\hat{} 10C_5$. Statement -2: The number of different ways the child can buy the six ice-creams is equal to the number of different ways of arranging 6 As and 4 Bs in a row.

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

Watch Video Solution

3. Statement-1: The expression

$^{40}C_r \times {}^{60}C_0 + {}^{40}C_{r-1} \times {}^{60}C_1 + {}^{40}C_{r-2} \times {}^{60}C_2 + ...$ attains its maximum volue when r = 50

Statement-2: $^{2n}C_r$ is maximum when r=n.

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

Watch Video Solution

4. Statement-1: The number of non-negative integral solutions of $x + y + z = 40$ is ${}^{43}C_3$.

Statement-2: The number of ways of distributing n identical items among r persons giving zero or more items to a person is ${}^{n+r-1}C_{r-1}$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

Watch Video Solution

5. Statement-1: The number solutions of the equations x+y+z=15 in the set N of all natural numbers is $^{14}C_2$.

Statement-2: The number of ways of distributing n identical items among r persons is $^{n+r-1}C_{r-1}$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

Watch Video Solution

6. Consider the natural number n=453600.

Statement-1: The number of divisors of n is 180.

Statement-2: The sum of the divisors of n is

$$\frac{(2^6-1)(3^5-1)(5^3-1)(7^2-1)}{48}$$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

Watch Video Solution

7. Statement-1: The number $1000C_{500}$ is not divisible by 11.

Statement-2: The exponent of prime p in n! is

$$\left[\frac{n}{p}\right]+\left[\frac{n}{p^2}\right]+\left[\frac{n}{p^3}\right]+\ldots\ldots+\left[\frac{n}{p^x}\right] \text{ where } p^k \le n < p^{k+1}$$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

Watch Video Solution

8. Statement-1: A student is allowed to select at most n books from a collection of (2n+1) books. If the total number of ways in which he can select at least one book is 255, then n=3.

Statement-2 $\sum_{r=1}^{n} {}^{2n+1}C_r = 2^{2n}$

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

Watch Video Solution

9. Statement-1: The number of ways distributing 10 identical balls in 4 distinct boxes such that no box is empty, is $.^9 C_3$.

Statement-2: The number of ways of choosing any 3 places from 9 different places is $.^9 C_3$.

A. Statement-1 is True, Statement-2 is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer:

Watch Video Solution

Exercise

1. The value of $\sum_{r=1}^{n} \frac{{}^{n}P_{r}}{r!}$ is

A. 2^{n}

B. $2^{n}-1$

C. $2^{n}-1$

D. $2^{n}+1$

Answer: B

Watch Video Solution

2. If ${}^{12}P_{r} = {}^{11}P_{6} + 6{}^{11}P_{5}$ then r is equal to

A. 6

B. 5

C. 7

D. none of these

Answer: A

Watch Video Solution

3. If ${}^{n-1}C_3 + {}^{n-1}C_4 > {}^{n}C_3$, then

A. $n \leq 4$

B. $n > 5$

C. $n > 7$

D. none of these

Answer: C

Watch Video Solution

4. ${}^{n}C_{r}+2^{n}C_{r-1}+^{n}C_{r-2}$ is equal to

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

B. ${}^{n}C_{r+1}$

C. ${}^{n-1}C_{r+1}$

D. none of these

Answer: D

Watch Video Solution

5. If $\hat{}\ 2n+1P_{n-1}:^{2n-1}P_{n}=3:5, f\in dn.$

A. 4

B. 6

C. 3

D. 8

Answer: A

Watch Video Solution

6. If $.^{35}C_{n+7} = .^{35}C_{4n-2}$ then find the value of n.

A. 28

B. 3,6

C. 3

D. 6

Answer: B

Watch Video Solution

7. If $.^{n}C_{r}=84, .^{n}C_{r-1}=36$ and $.^{n}C_{r+1}=126$, then find the value of n.

A. n=8,r=4

B. n=9,r=3

C. n=7,r=5

D. none of these

Answer: B

Watch Video Solution

8. If $(n-1)C_{6}+(n-1)C_{7}>nC_{6}$ then

A. $n > 4$

B. $n > 12$

C. $n \geq 13$

D. $n > 13$

Answer: D

Watch Video Solution

9. Which of the following is incorrect?

A. ${}^{n}C_{r} = {}^{n}C_{n-r}$

B. ${}^{n}C_{r} = {}^{n-1}C_{r} + {}^{n}C_{n-r}$

C. ${}^{n}C_{r} = {}^{n-1}C_{r} + {}^{n-1}C_{n-r}$

D. $r!{}^{n}C_{r} = {}^{n}P_{n}$

Answer: B

Watch Video Solution

10. If $\hat{}\ (56)P_{r+6} :^{54} P_{r+3} = 30800 : 1,$ find r.

A. 40

B. 41

C. 42

D. none of these

Answer: B

Watch Video Solution

11. The value of $\sum_{r=0}^{m} {}^{n+r}C_n$ is equal to :

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

B. ${}^{n+m+2}C_{n}$

C. ${}^{n+m+3}C_{n-1}$

D. none of these

Answer: A

Watch Video Solution

12. Every two persons shakes hands with each other in a party and the total number of handis 66. The number of guests in the party is

A. 11

B. 12

C. 13

D. 14

Answer: B

Watch Video Solution

13. On the occasion if Deepawali festival, each student in a class sends greeting cards to others. If there are 20 students in the class, find the total number of greeting cards exchanged by the students.

A. ${}^{20}C_2$

B. $2.\ {}^{20}C_2$

C. $2 \times {}^{20}P_2$

D. none of these

Answer: B

Watch Video Solution

14. If $\hat{}\ n+2C_8 :^{n-2} P_4 : 57 : 16,$ find n.

A. 20

B. 19

C. 18

D. 17

Answer: B

Watch Video Solution

15. Find the exponent of 3 in 100!

A. 33

B. 44

C. 48

D. 52

Answer: C

Watch Video Solution

16. Ten different letters of an alphabet are given. Words with five letters are formed from these given letters. Determine the number4 of words which have at least one letter repeated.

A. 69760

B. 30240

C. 99748

D. none of these

Answer: A

Watch Video Solution

17. If 7 points out of 12 are in the same straight line, then the number of triangles formed is

A. 19

B. 158

C. 185

D. 201

Answer: C

Watch Video Solution

18. about to only mathematics

A. 9

B. 10

C. 11

D. 12

Answer: C

Watch Video Solution

19. No. of diagonals of a polygon are 170. No. of sides in this polygon are:

A. 12

B. 17

C. 20

D. 25

Answer: C

Watch Video Solution

20. The number of all possible selections of one or more questions from 10 given questions, each question having an alternative is :

A. 310

B. $2^{10} - 1$

C. $3^{10} - 1$

D. 2^{10}

Answer: C

Watch Video Solution

21. The number of ways of painting the faces of a cube with six different colours is

A. 1

B. 6

C. 6!

D. none of these

Answer: A

Watch Video Solution

22. A box contains 4 white balls, 5 black balls and 2 red balls. The number of ways three balls be drawn from the box, if atleast one black ball is to be included in the draw is ....

A. 129

B. 84

C. 64

D. none of these

Answer: C

Watch Video Solution

23. Find the number of different permutations of the letters of the word BANANA?

A. 720

B. 60

C. 120

D. 360

Answer: B

Watch Video Solution

24. A person tries to form as many different parties as he can, out of his 20 friends. Each party should consist of the same number. How many friends should be invited at a time ? In how many of these parites would the same friends be found ?

A. 5

B. 10

C. 8

D. none of these

Answer: B

Watch Video Solution

25. Find the number of ways in which 8 different flowered can be strung to form a garland so that four particular flowers are never separated.

A. $4!.4!$

B. $\frac{8!}{4!}$

C. 288

D. none of these

Answer: A

Watch Video Solution

26. The number of words which can be formed out of the letters $a, b, c, d, e\ f$ taken 3 together, each word containing one vowel at least is

A. 72

B. 48

C. 96

D. none of these

Answer: C

Watch Video Solution

27. The smallest value of x satisfying the inequality ${}^{10}C_{x-1} > 2.\,{}^{10}C_x$ is.

A. 7

B. 10

C. 9

D. 8

Answer: D

Watch Video Solution

28. The number of arrangenments which can be made using all the letters of the word LAUGH, if the vowels are adjacent, is

A. 10

B. 24

C. 48

D. 120

Answer: C

Watch Video Solution

29. The number of ways of choosing a committee of 4 women and 5 men from 10 women and 9 men, if Mr. A refuses to serve on the committee when Ms. B is a member of the committee, is

A. 20580

B. 21000

C. 21580

D. all the above

Answer: A

Watch Video Solution

30. A set contains 2n+1 elements. The number of subsets of this set containing more than n elements :

A. 2^{n-1}

B. 2^{n}

C. 2^{n+1}

D. 2^{2n}

Answer: D

Watch Video Solution

31. The number of ways in which any four letters cab be selected from the word 'CORGOO' is

A. 15

B. 11

C. 7

D. none of these

Answer: C

Watch Video Solution

32. A 5 digit number divisible by 3 is t formed sing the digits 0,1,2,3,4 and 5 without repetition. The total number of ways in which this can be done is 216 b. 600 c. 240 d. 3125

A. 216

B. 240

C. 600

D. 3125

Answer: A

Watch Video Solution

33. If 7 points out of 12 are in the same straight line, then the number of triangles formed is

A. 19

B. 158

C. 185

D. 201

Answer: C

Watch Video Solution

34. If a denotes the number of permutations of $(x+2)$ things taken all at a time, b the number of permutations of x things taken 11 at a time and c the number of permutations of $x-11$ things taken all at a time such that $a=182bc,$ find the value of $x\cdot$

A. 15

B. 12

C. 10

D. 18

Answer: B

Watch Video Solution

35. There are number of seats and m number of people have to be seated, then how many ways are possible to do this $(m < n)$?

A. ${}^{n}P_{m}$

B. ${}^{n}C_{m}$

C. ${}^{n}C_{n} \times (m-1)!$

D. ${}^{n-1}P_{m-1}$

Answer: A

Watch Video Solution

36. There are 5 letters and 5 directed envelopes. The number of ways in which all the letters can be put in wrong engvelope, is

A. 119

B. 44

C. 59

D. 40

Answer: B

Watch Video Solution

37. Find the number of ways of selecting 10 balls out o fan unlimited number of identical white, red, and blue balls.

A. 286

B. 84

C. 715

D. none of these

Answer: A

Watch Video Solution

38. The total number of different combinations of letters which can be made from the letters of the word MISSISSIPPI, is

A. 150

B. 148

C. 149

D. none of these

Answer: C

Watch Video Solution

39. The total number of six-digit natural numbers that can be made with the digits 1, 2, 3, 4, if all digits are to appear in the same number at least once is a. 1560 b. 840 c. 1080 d. 480

A. 1560

B. 840

C. 1080

D. 480

Answer: A

Watch Video Solution

40. The number of numbers of 7 digits whose sum of digits is even, is

A. 9000000

B. 4500000

C. 8100000

D. none of these

Answer: B

Watch Video Solution

41. All possible four-digit numbers have formed using the digits 0, 1, 2, 3 so that no number has repeated digits. The number of even numbers among them, is

A. 9

B. 18

C. 10

D. none of these

Answer: C

Watch Video Solution

42. If the permutations of a, b, c, d, e taken all together be written dowan in alphabetical order as in dictionary and numbered then the rank of the permutation debac, is

A. 90

B. 91

C. 92

D. 93

Answer: D

Watch Video Solution

43. Determine the number of natural numbers smaller than 10^4, in the decimal notation of which all the digits are distinct.

A. 5274

B. 5265

C. 4676

D. none of these

Answer: A

Watch Video Solution

44. If eight persons are to address a meeting, then the number of ways in which a specified speaker is to speak before another specified speaker, is

A. 2520

B. 20160

C. 40320

D. none of these

Answer: B

Watch Video Solution

45. Find the number of proper factors of the number 38808. also, find sum of all these divisors.

A. 72

B. 70

C. 69

D. 71

Answer: B

Watch Video Solution

46. All possible products are formed from the numbers $1, 2, 3, 4, \ldots, 200$ by selecting any two without repetition. The number of products out of the total obtained which are multiples of 5 is :

A. 5040

B. 7180

C. 8150

D. none of these

Answer: B

Watch Video Solution

47. In an examinations there are three multiple choice questions and each questions has 4 choices. Find the number of ways in which a student can fail to get all answer correct.

A. 11

B. 15

C. 80

D. 63

Answer: D

Watch Video Solution

48. If all the words formed with the letters of the word 'RANDOM' arranged in a dictionary then the word 'RANDOM' will be placed at position no:

A. 614

B. 615

C. 613

D. 616

Answer: A

Watch Video Solution

49. Find the sum of all the numbers that can be formed with the digits 2, 3, 4, 5 taken all at a time.

A. 93324

B. 66666

C. 84844

D. none of these

Answer: A

Watch Video Solution

50. The sum of the digits in unit place of all the numbers formed with the help of 3, 4, 5 and 6 taken all at a time is

A. 18

B. 108

C. 432

D. none of these

Answer: B

Watch Video Solution

51. If the letters of the word MOTHER are written in all possible orders and these words are written out as in a dictionary, find rank of the word MOTHER.

A. 240

B. 261

C. 308

D. 309

Answer: D

Watch Video Solution

52. Numbers greater than 1000 but not greater than 4000 which can be formed with the digits 0, 1, 2, 3, 4 (repetition of digits is allowed) are a. 350 b. 375 c. 450 d. 576

A. 375

B. 374

C. 376

D. none of these

Answer: A

Watch Video Solution

53. The number of ways in which 5 picturers can be hung from 7 picture nails on the wall is

A. 7^5

B. 5^7

C. 2520

D. none of these

Answer: C

Watch Video Solution

54. The number of all four digit numbers which are divisible by 4 that can be formed from the digits 1, 2, 3, 4, and 5, is

A. 125

B. 30

C. 95

D. none of these

Answer: A

Watch Video Solution

55. The number of all five digit numbers which are divisible by 4 that can be formed from the digits 0,1,2,3,4 (with repetition) is

A. 36

B. 30

C. 34

D. none of these

Answer: D

Watch Video Solution

56. The number of ways in which $m+n(n \leq m+1)$ different things can be arranged in a row such that no two of the n things may be together, is

A. $\frac{(m+n)!}{m!n!}$

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

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

D. none of these

Answer: C

Watch Video Solution

57. All possible two-factor products are formed from the numbers 1, 2,.....,100. The numbers of factors out of the total obtained which are multiple of 3, is

A. 2211

B. 4950

C. 2739

D. none of these

Answer: C

Watch Video Solution

58. m men and n women ae to be seated in a row so that no two women sit together. If $m > n$ then show that the number of ways n which they fan be seated as $\frac{m!(m+1)!}{(m-n+1)!}$.

A. $\dfrac{m!n!}{(m+n)!}$

B. $\dfrac{m!(m+1)!}{(m-n+1)!}$

C.

D. none of these

Answer: B

Watch Video Solution

59. Find the number of ways in which six '+' and four '-' signs can be arranged in a line such that no two '-' signs occur together.

A. 35

B. 15

C. 30

D. none of these

Answer: A

Watch Video Solution

60. If in a chess tournament each contestant plays once against each of the other and in all 45 games are played, then the number of participants, is

A. 9

B. 10

C. 15

D. none of these

Answer: B

Watch Video Solution

Watch Video Solution

61. Total number of four digit odd numbers that can be formed by using $0, 1, 2, 3, 5, 7$ are

A. 216

B. 375

C. 400

D. 720

Answer: D

Watch Video Solution

62. A committee of 5 is to be formed from 9 ladies and 8 men. If the committee commands a lady majority, then the number of ways this can be done is

A. 2352

B. 1008

C. 3360

D. 3486

Answer: D

Watch Video Solution

63. The number of ordered triplets, positive integers which are solutions of the equation x+y+z=100 is:

A. 6005

B. 4851

C. 5081

D. none of these

Answer: B

Watch Video Solution

64. Find the number of straight lines that can be drawn through any two points out of 10 points, of which 7 are collinear.

A. 26

B. 21

C. 25

D. none of these

Answer: C

Watch Video Solution

65. The number of ways in which 10 candidates A_1, A_2, A_{10} can be ranked such that A_1 is always above A_{10} is a. $5!$ b. $2(5!)$ c. $10!$ d. $\frac{1}{2}(10!)$

A. 5!

B. 2(5!)

C. 10!

D. none of these

Answer: D

Watch Video Solution

66. , the number of ways in which 10 candidates A_1 and A_2 can be ranked if if A1 is always above A2

A. 9!

B. 2(9!)

C. $\frac{1}{2}(9!)$

D. none of these

Answer: B

Watch Video Solution

67. The total number of all proper factors of 75600, is

A. 120

B. 119

C. 118

D. none of these

Answer: C

Watch Video Solution

68. The total number of ways in which 11 identical apples can be distributed among 6 children such that every student gets atleast one apple,is

A. 252

B. 462

C. 42

D. none of these

Answer: A

Watch Video Solution

69. Number of ways in which a pack of 52 playing cards be distributed equally among four players so that each may have the Ace, King, Queen and Jack of the same suit, is:

A. ${}^{52}C_{13}$

B. ${}^{52}C_4$

C. $\frac{52!}{(13!)^4}$

D. $\frac{52!}{(13!)^4 4!}$

Answer: C

Watch Video Solution

70. (i) In how many ways can a pack of 52 cards be divided equally among four players? (ii) (ii) In how many ways can you divide these cards in four sets, three of them having 17 cards each and the four the one just one card?

A. $\frac{52!}{(17!)^3}$

B. $\frac{52!}{(17!)^3 3!}$

C. $\frac{51!}{(17!)^3}$

D. $\frac{51!}{(17!)^3 3!}$

Answer: B

Watch Video Solution

71. The total number of ways of dividing 15 different things into groups of $8.$, 4 and 3 respectively, is

A. $\frac{15!}{8!4!(3!)^2}$

B. $\frac{15!}{8!4!3!}$

C. $\frac{15!}{8!4!}$

D. none of these

Answer: B

Watch Video Solution

72. There are three copies each of 4 different books. In how many ways can they be arranged in a shelf?

A. $\frac{12!}{(3!)^4}$

B. $\frac{12!}{(4!)^3}$

C. $\frac{12!}{(3!)^4 4!}$

D. $\dfrac{12!}{(4!)^3 3!}$

Answer: A

Watch Video Solution

73. The number of ways in which 12 books can be put in three shelves with four on each shelf is a. $\dfrac{12!}{(4!)^3}$ b. $\dfrac{12!}{(3!)(4!)^3}$ c. $\dfrac{12!}{(3!)^3 4!}$ d. none of these

A. $\dfrac{12!}{(4!)^3}$

B. $\dfrac{12!}{(3!)(4!)^3}$

C. $\dfrac{12!}{(3!)^3 4!}$

D. none of these

Answer: A

Watch Video Solution

74. The number of ways in which 12 different objects can be divided into three groups each containing 4 objects is

(i) $\frac{(12!)}{(4!)^3(!3)}$

(ii) $\frac{(12!)}{(4!)^3}$

(iii) $\frac{(12!)}{(4!)}$

(iv) none

A. $\frac{12!}{(13!)^3 4!}$

B. $\frac{12!}{(4!)^3}$

C. $\frac{12!}{(4!)^3 3!}$

D. $\frac{12!}{(3!)^4}$

Answer: C

Watch Video Solution

75. The number of ways in which 12 balls can be divided between two friends, one receiving 8 and the other 4, is

A. $\frac{12!}{8!4!}$

B. $\frac{12!12!}{8!4!}$

C. $\frac{12!}{8!4!2!}$

D. none of these

Answer: B

Watch Video Solution

76. The total number of ways in which $2n$ persons can be divided into n couples is a. $\frac{2n!}{n!n!}$ b. $\frac{2n!}{(2!)^3}$ c. $\frac{2n!}{n!(2!)^n}$ d. none of these

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

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

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

D. none of these

Answer: C

Watch Video Solution

77. The total number of ways of selecting six coins out of 20 one-rupee coins, 10 fifty-paisa coins, and 7 twenty-five paisa coins is a. 28 b. 56 c. $\hat{\ } 37C_6$ d. none of these

A. 28

B. 56

C. $^{37}C_6$

D. none of these

Answer: A

Watch Video Solution

78. The number of ways in which thirty five apples can be distributed among 3 boys so that each can have any number of apples, is :

A. 1332

B. 666

C. 333

D. none of these

Answer: B

Watch Video Solution

Watch Video Solution

79. A person goes for an examination in which there are four papers with a maximum of m marks from each paperr. The number of ways in which one can get 2m marks, is

A. ${}^{2m+3}C_3$

B. $\frac{1}{3}(m+1)\left(2m^2+4m+1\right)$

C. $\frac{1}{3}(m+1)\left(2m^2+4m+3\right)$

D. none of these

Answer: C

Watch Video Solution

80. If m parallel lines in a plane are intersected by a family of n parallel lines, the number of parallelograms that can be formed is a. $\frac{1}{4}mn(m-1)(n-1)$ b. $\frac{1}{4}mn(m-1)$ c. $\frac{1}{4}m^2n^2$ d. none of these

A. $\frac{(m-1)(n-1)}{4}$

B. $\frac{mn}{4}$

C. $\frac{m(m-1)n(n-1)}{2}$

D. $\frac{mn(m-1)(n-1)}{4}$

Answer: D

Watch Video Solution

81. 1, 2, 3, 4 are four numbers. How many numbers can be made using all four numbers without repetition?

A. 1!

B. 3!

C. 2!

D. 4!

Answer: D

Watch Video Solution

82. There were two women participating in a chess tournament. Every participant played two games with the other participants. The number of games that the men played among themselves proved to exceed by 66 number of games that the men played with eth women. The number of participants is a. 6 b. 11 c. 13 d. none of these

A. 6

B. 11

C. 13

D. none of these

Answer: C

Watch Video Solution

83. A parallelogram is cut by two sets of m lines parallel to its sides. The number of parallelogram thus formed, is

A. $\left({}^{m}C_{2}\right)^{2}$

B. $\left({}^{m+1}C_{2}\right)^{2}$

C. $\left({}^{m+2}C_{2}\right)^{2}$

D. none of these

Answer: C

Watch Video Solution

84. There are n straight lines in a plane in which no two are parallel and no three pass through the same point. Their points of intersection are joined. Show that the number of fresh lines thus introduced is $\frac{1}{8}n(n-1)(n-2)(n-3)$

A. $\frac{n(n-1)(n-1)}{8}$

B. $\frac{n(n-1)(n-2)(n-3)}{6}$

C. $\frac{n(n-1)(n-2)(n-3)}{8}$

D. none of these

Answer: C

Watch Video Solution

85. Out of 18 points in as plane, no three points are in the same straight line except five points which are collinear. The number of straight lines formed by joining them is

A. 805

B. 806

C. 816

D. none of these

Answer: B

Watch Video Solution

86. Given 5 different green dyes, four different blue dyes and three different red dyes, how many combinations of dyes can be chosen taking at least one green and one blue dye ?

A. 3255

B. 212

C. 3720

D. none of these

Answer: C

Watch Video Solution

87. Eight chairs are numbered 1 to 8. Two women and three men wish to occupy one chair each. First, the women choose the chairs from amongst the chairs marked 1 to 4, and then the men select th chairs from amongst the remaining. The number of possible arrangements is a. $\hat{} \; 6C_3 \times^4 C_2$ b. $\hat{} \; 4P_2 \times^4 P_3$ c. $\hat{} \; 4C_2 \times^4 P_3$ d. none of these

A. ${}^4C_3 \times {}^4C_2$

B. ${}^4C_2 \times {}^4P_3$

C. ${}^4P_2 \times {}^4P_3$

D. none of these

Answer: D

Watch Video Solution

88. A student is allowed to select atlest one an atmost n books from a collection of (2n+1) books. If the total number of ways in which he can select books is 63, find the value of n.

A. 6

B. 3

C. 4

D. none of these

Answer: B

Watch Video Solution

89. In a steamer there are stalls for 12 animals and there are cows, horses and calves (not less than 12 of each) ready to be shipped, the total number of ways in which the shipload can be made, is

A. 3^{12}

B. 12^3

C. $^{12}P_3$

D. $^{12}C_3$

Answer: A

Watch Video Solution

90. The number of different numbers that can be formed by using all the digits 1, 2, 3, 4,3, 2,1 so that odd digits always occupy the odd places IS 1) 6 2)72 3) 60 4) 18

A. 3!4!

B. 34

C. 18

D. 12

Answer: C

Watch Video Solution

91. Number of ways in which RS. 18 can be distributed amongst four persons such that no body receives less than RS 4, is

A. 42

B. 24

C. 4!

D. none of these

Answer: D

Watch Video Solution

92. A box contains 2 white balls, 3 black balls & 4 red balls. In how many ways can three balls be drawn from the box if atleast one black ball is to be included in draw (the balls of the same colour are different).

A. 74

B. 64

C. 84

D. 20

Answer: B

Watch Video Solution

93. The number of ways in which four letters can be selected from the word degree, is

A. 7

B. 6

C. $\frac{6!}{3!}$

D. none of these

Answer: A

Watch Video Solution

94. find the number of arrangements which can be made out of the letters of the word 'algebra', without altering the relative positions of vowels and consonants.

A. $\frac{7!}{2!}$

B. $\frac{7!}{2!5!}$

C. 4!3!

D. $\frac{4!3!}{2}$

Answer: D

Watch Video Solution

95. The number of ways in which seven persons can be arranged at a round table if two particular persons may not sit together, is

A. 480

B. 120

C. 80

D. none of these

Answer: A

Watch Video Solution

Watch Video Solution

96. The total number of ways in which 4 boys and 4 girls can form a line, with boys and girls alternating, is

A. (4!)2

B. 8!

C. 2(4!)^2

D. $4!.\,^5P_4$

Answer: C

Watch Video Solution

97. How many different words can be formed by jumbling the letters in the words MISSISSIPPI in which no two S are adjacent?

A. $8 \times {}^6C_4 \times {}^7C_4$

B. $6 \times 7 \times {}^8C_4$

C. $6 \times 8 \times {}^7C_4$

D. $7 \times {}^6C_4 \times {}^8C_4$

Answer: D

Watch Video Solution

98. A code word consists of three letters of the English alphabet followed by two digits of the decimal system. If neither letter nor digit is repeated in any code word, then the total number of code words, is

A. 1404000

B. 16848000

C. 2808000

D. none of these

Answer: A

Watch Video Solution

99. Find the number of words formed by permuting all the letters of the following word: EXERCISES

A. 60480

B. 30240

C. 10080

D. none of these

Answer: B

Watch Video Solution

100. A father with 8 children takes 3 at a time to the Zoological Gardens, as often as he can without taking the same 3 children together more than once. The number of times he will go to the garden, is

A. 336

B. 112

C. 56

D. none of these

Answer: C

Watch Video Solution

101. A man has 8children to take them to a zoo. He takes thre of them at a time to the zoo as often as he can without taking the same 3 children together more than once. How many times will he have to go to the zoo? How many times a particular child will to to the zoo?

A. 56

B. 21

C. 112

D. none of these

Answer: B

Watch Video Solution

102. If the letters of the word 'LATE' be permuted and the words so performed be arranged as in a dictionary, find rank of the word LATE.

A. 12

B. 13

C. 14

D. 15

Answer: C

Watch Video Solution

103. The total number of ways of arranging the letters AAAA BBB CC D E F in a row such that letters C are separated from one another, is

A. 2772000

B. 1386000

C. 4158000

D. none of these

Answer: B

Watch Video Solution

104. The side AB, BC and CA of a triangle ABC have 3,4 and 5 interior points respectively on them. Find the number of triangles that can be constructed using these interior points as vertices.

A. 220

B. 204

C. 205

D. 195

Answer: C

Watch Video Solution

105. There are four balls of different colours and four boxes of colours same as those of the balls. Find the number of ways in which the balls, one in each box, could be placed such that a ball is not placed in the box of its own colour.

A. 9

B. 24

C. 12

D. none of these

Answer: A

Watch Video Solution

106. The number of all the possible selections which a student can make for answering one or more questions out of eight given questions in a paper, when each question has an altrenative, is

A. 256

B. 6560

C. 6561

D. none of these

Answer: B

Watch Video Solution

107. The greatest possible number of points of intersection of 8 straight lines and 4 circles is:

A. 32

B. 64

C. 76

D. 104

Answer: D

Watch Video Solution

108. A lady gives a dinner party to 5 guests to be selected from nine friends. The number of ways of forming the party of 5, given that two of the friends will not attend the party together, is

A. 56

B. 126

C. 91

D. none of these

Answer: C

Watch Video Solution

109. There are 10 lamps in a hall. Each one of them can be switched on independently. Find the number of ways in which the hall can be illuminated.

A. 102

B. 1023

C. 210

D. 10!

Answer: B

Watch Video Solution

110. The number of ways in which four persons be seated at a round table, so that all shall not have the same neighbours in any two arrangements,is

A. 24

B. 6

C. 3

D. 4

Answer: C

Watch Video Solution

111. At an election there are five candidates and three members to be elected, and an elector may vote for any number of candidates not greatre than the number to be elected. Then the number of ways in which an elector may vote, is

A. 25

B. 30

C. 32

D. none of these

Answer: A

Watch Video Solution

112. There are p copies each of n different books. Find the number of ways in which a nonempty selection can be made from them.

A. np

B. pn

C. $(p+1)^n - 1$

D. $(n+1)p - 1$

Answer: C

Watch Video Solution

113. A library has two books each having three copies and three other books each having tow copies. In how many ways can all these books be arranged in a shelf so that copies of the same book are not separated.

A. $\dfrac{(a+b+c+d)!}{a!b!c!}$

B. $\dfrac{(a+2b+3c+d)!}{a!(b!)^2(c!)^3}$

C. $\dfrac{(a+2b+3c+d)!}{a!b!c!}$

D. none of these

Answer: B

Watch Video Solution

114. The total number of arrangements of the letters in the expression $a^3b^2c^4$ when written at full length, is

A. 1260

B. 2520

C. 610

D. none of these

Answer: A

Watch Video Solution

115. The total number of selections of fruit which can be made from 3 bananas, 4 apples and 2 oranges, is

A. 39

B. 315

C. 512

D. none of these

Answer: D

Watch Video Solution

116. The total number of ways of dividing mn things into n equal groups, is

A. $\frac{(mn)!}{m!n!}$

B. $\frac{(mn)!}{(m!)^m n!}$

C. $\frac{(mn)!}{(m!)^n n!}$

D. none of these

Answer: C

Watch Video Solution

117. How many different words of 4 letters can be formed with the letters of the word EXAMINATION?

A. 2454

B. 2436

C. 2545

D. none of these

Answer: A

Watch Video Solution

118. $\sum_{r=1}^{4} {}^{21-r}C_4 + 17C_5, is$

A. ${}^{21}C_6$

B. $46C_8$

C. ${}^{21}C_7$

D. ${}^{21}C_5$

Answer: D

Watch Video Solution

119. Given that $.^{n} C_{n-r}+3^{n} C_{n-r+1}+3.$

$.^{n} C_{n-r+2}+.^{n} C_{n-r+3}=.^{x} C_{r}$. Find x

A. n+1

B. n+2

C. n+3

D. n+4

Answer: C

Watch Video Solution

120. If n is even and

$$^nC_0 < {}^nC_1 < {}^nC_2 < .... < {}^nC_r > {}^nC_{r+1} > {}^nC_{r+2} > ...... > {}^nC_n$$

, then, r=

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

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

C. $\frac{n-2}{2}$

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

Answer: A

Watch Video Solution

121. Find the number of ways in which one can post 5 letters in 7letter boxes.

A. 35

B. ${}^{7}P_{5}$

C. 7^5

D. 5^7

Answer: C

Watch Video Solution

122. What is the total number of 2×2 matrices with each entry 0 or 1?

A. 8

B. 16

C. 4

D. none of these

Answer: B

Watch Video Solution

123. Three dice are rolled. Find the number of possible outcomes in which at least one dice shows 5.

A. 215

B. 36

C. 125

D. 91

Answer: D

Watch Video Solution

124. The numbers of four different digits number that can be formed from the digits of the number 12356 such that the numbers are divisible by 4, is

A. 36

B. 48

C. 12

D. 24

Answer: A

Watch Video Solution

125. If m and n are positive integers more than or equal to 2, $m > n$, then (mn)! is divisible by

A. $(m!)^n, (n!)^m$ and $(m+n)!$ but not by (m-n)!

B. $(m+n)!, (m-n)!, (m!)^n$ but $(n!)^m$

C. $(m!)^n, (n!)^m, (m+n)!$ and $(m-n)!$

D. $(m!)^n$ and $(n!)^m$ but not by (m+n)!and(m-n)!

Answer: C

Watch Video Solution

126. Find the number of integers which lie between 1 and 10^6 and which have the sum of the digits equal to 12.

A. 8550

B. 5382

C. 6062

D. 8055

Answer: C

Watch Video Solution

127. A man invites a party to (m+n) friends to dinner and places m at one round table and n at another. The number of ways of arranging the guests is

A. $\frac{(m+n)!}{m!n!}$

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

C. $(m-1)!(n-1)!$

D. none of these

Answer: D

Watch Video Solution

128. The number of ways of arranging m positive and $n(<m+1)$ negative signs in a row so that no two are together is a.= $\hat{}\ m+1p_n$ b.= $\hat{}\ n+1p_m$= c.= $\hat{}\ m+1c_n$="" d.= $\hat{}\ n+1c_m$

A. $^{m+1}+P_n$

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

C. $^{m+1}+C_n$

D. $^{n+1}+C_m$

Answer: C

Watch Video Solution

129. Out of 10 consonants four vowels, the number of words that can be formed using six consonants and three vowels, is

A. ${}^{10}P_6 \times {}^{6}P_3$

B. ${}^{10}C_6 \times {}^{6}C_3$

C. ${}^{10}C_6 \times {}^{4}C_3 \times 9!$

D. ${}^{10}P_6 \times {}^{4}P_3$

Answer: C

Watch Video Solution

130. Four couples (husband and wife) decide to form a committee of four members. The number of different committees that can be formed in which no couple find a place is λ, then the sum of digits of λ is :

A. 10

B. 12

C. 14

D. 16

Answer: D

Watch Video Solution

131. N a certain test, there are n question. In the test, 2^{n-i} students gave wrong answers to at least i questions, where $i = 1, , 2; n.$ if the total number of wring answers given is 2047, then n is equal to a. 10 b. 11 c. 12 d. 13

A. 12

B. 11

C. 10

D. none of these

Answer: B

Watch Video Solution

132. The number of nine nonzero digits such that all the digits in the first four places are less than the digit in the middle and all the digits in the last four places are greater than that in the middle is a. $2(4!)$ b. $3(7!)/2$ c. $2(7!)$ d. $\hat{}\ 4P_4 \times^4 P_4$

A. 48

B. 576

C. 8!

D. none of these

Answer: B

Watch Video Solution

133. The number of ways in which 20 different pearls of two colours can be set alternately on a necklace, there being 10 pearls of each colour, is:

A. $9! \times 10!$

B. $5 \times (9!)^2$

C. $(9!)^2$

D. none of these

Answer: B

Watch Video Solution

134. There are n seats round a table numbered $1, 2, 3, \ldots, n$. The number of ways in which $m(\leq n)$ persons can take seats is

A. $(n)C_m$

B. $^nC_m \times m!$

C. $(m-1)!$

D. $(m-1)! \times (n-1)!$

Answer: B

Watch Video Solution

135. A shopkeeper sells three varieties of perfumes and he has a large number of bottles of the same size of each variety in his stock. There are 5 places in row in his showcase. The number of different ways of displaying the three varieties of perfumes in the showcase is:

A. 6

B. 50

C. 150

D. none of these

Answer: C

Watch Video Solution

136. If $r > p > q$, the number of different selections of $p + q$ things taking r at a time, where p things are identical and q other things are identical, is

A. $p + q - r$

B. $p+q-r+1$

C. $r-p-q+1$

D. none of these

Answer: B

Watch Video Solution

Chapter Test

1. 7 women and 7 men are to sit round a circulartable such that there is a man on either side ofevery women. The number of seating arrangements is

A. $(7!)^2$

B. $(6!)^2$

C. $6! \times 7!$

D. 7!

Answer: C

Watch Video Solution

2. There are $(n+1)$ white and $(n+1)$ black balls, each set numbered $1 \rightarrow n+1$. The number of ways in which the balls can be arranged in a row so that the adjacent balls are of different colors is a. $(2n+2)!$ b. $(2n+2)! \times 2$ c. $(n+1)! \times 2$ d. $2\{(n+1)!\}^2$

A. $(2n+2)!$

B. $(2n+2)! \times 2$

C. $(n+1)! \times 2$

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

Answer: D

Watch Video Solution

3. 12 persons are to be arranged to a round table. If two particular persons among them are not to be side by side, the total number of arrangements, is

A. $9(10!)$

B. $2(10!)$

C. $45(8!)$

D. $10!$

Answer: A

Watch Video Solution

Watch Video Solution

4. The number of committees of 5 persons consisting of at least one female number, that can be formed from 6 males and 4 females, is

A. 246

B. 252

C. 6

D. none of these

Answer: A

Watch Video Solution

5. The number of ways in which a team of eleven players can be selected from 22 players always including 2 of them and excluding 4 of them is

(i) $.^{16}C_{11}$

(ii) $.^{16}C_{5}$

(iii) $.^{16}C_{5}$

(iv) $.^{16}C_{9}$

A. $^{16}C_{11}$

B. $^{16}C_{5}$

C. $^{16}C_{9}$

D. $^{20}C_{9}$

Answer: C

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6. In a football championship, 153 matches were played. Every two-team played one match with each other. The number of teams, participating in the championship is _______.

A. 17

B. 18

C. 9

D. none of these

Answer: B

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7. How many numbers between 5000 and 10,000 can be formed using the digits 1,2,3,4,5,6,7,8,9, each digit appearing not more than once in each number?

A. $5 \times {}^8P_3$

B. $5 \times {}^8C_8$

C. $5! \times {}^8P_3$

D. $5! \times {}^8C_3$

Answer: A

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8. If x, y and r are positive integers, then

${}^xC_r + {}^xC_{r-1} + {}^yC_1 + {}^xC_{r-2}{}^yC_2 + \ldots\ldots + {}^yC_r =$

A. $\dfrac{x!y!}{r!}$

B. $\dfrac{(x!y!)}{r!}$

C. ${}^{x+y}C_r$

D. ${}^{xy}C_r$

Answer: C

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9. In how many ways can 5 red and 4 white balls be drawn from a bag containing 10 red and 8 white balls

A. ${}^{8}C_5 \times {}^{10}C_4$

B. ${}^{10}C_5 \times {}^{8}C_4$

C. ${}^{18}C_9$

D. none of these

Answer: B

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10. All the letters of the word 'EAMCET' are arranged in all possible ways. The number of such arrangements in which two vowels are not adjacent to each other is

A. 360

B. 144

C. 72

D. 54

Answer: C

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11. There are 10 lamps in a hall. Each one of them can be switched on independently. Find the number of ways in which the hall can be illuminated.

A. 10^2

B. 1023

C. 2^{10}

D. 10!

Answer: B

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12. How many 10-digit numbers can be formed by using digits 1 and 2

A. ${}^{10}C_1 + {}^{9}C_2$

B. 2^{10}

C. 10^2

D. 10!

Answer: B

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13. The straight lines I_1, I_2, I_3 are parallel and lie in the same plane. A total number of m point are taken on I_1, n points on I_2, k points on I_3. The maximum number of triangles formed with vertices at these points are

A. ${}^{m+n+k}C_3$

B. ${}^{m+n+k}C_3 - {}^{m}C_3 - {}^{n}C_3 - {}^{k}C_3$

C. ${}^{m}C_3 + {}^{n}C_3 + {}^{k}C_3$

D. none of these

Answer: B

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14. about to only mathematics

A. 6

B. 18

C. 12

D. 9

Answer: B

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15. The number of diagonals that can be drawn by joining the vertices of an octagon is a. 20 b. 28 c. 8 d. 16

A. 28

B. 48

C. 20

D. none of these

Answer: C

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16. The sum of the digits in unit place of all the numbers formed with the help of 3, 4, 5 and 6 taken all at a time is

A. 432

B. 108

C. 36

D. 18

Answer: B

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17. In an examinations there are three multiple choice questions and each questions has 4 choices. Find the number of ways in which a student can fail to get all answer correct.

A. 11

B. 12

C. 27

D. 63

Answer: D

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18. There are 10 points in a plane, out of these 6 are collinear. If N is the number of triangles formed by joining these points, then

A. 100

B. 120

C. 150

D. none of these

Answer: A

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19. Ramesh has 6 friends. In how many ways can be invite one or more of them at a dinner ? (A) 61 (B) 62 (C) 63 (D)64

A. 61

B. 62

C. 63

D. 64

Answer:

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20. If P_m stands for $\hat{\ } mP_m$, then prove that: $1 + 1.\ P_1 + 2.\ P_2 + 3.\ P_3 + \ + n\dot{P}_n = (n+1)!$

A. $(n - 1!)$

B. n!

C. $(n+1)!-1$

D. none of these

Answer:

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21. The number of ways four boys can be seated around a round talble in four chairs of ditterent colours, is

A. 24

B. 12

C. 23

D. 64

Answer: A

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22. We are required to form different words with the help of the letters of the word INTEGER. Let be the number of words in which I and N are never together and be the number of words which begin with I and end with R, then m_1 / m_2 is given by:

A. 42

B. 30

C. 6

D. $1/30$

Answer: B

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23. A candidate is required to answer 6 out of 10 questions, which are divide into two groups, each containing 5 questions. He is not permitted to attempt more than 4 questions from either group. The number of different ways in which the candidate can choose 6 questions is a. 50 b. 150 c. 200 d. 250

A. 200

B. 150

C. 100

D. 50

Answer: A

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24. The number of ways in which 6 men and 5 women can dine at a round table if no two women are to sit together is given by.

A. $7! \times 5!$

B. $6! \times 5!$

C. 30

D. 50

Answer: B

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25. A students is to answer 10 out of 13 questions in an examminations such that he must choose at least 4 from the first five questions. Find the numbers of choices available to him.

A. 346

B. 140

C. 196

D. 280

Answer: C

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26. Write the number of all possible words that can be formed using the letters of the word MATHEMATICS.

A. $\frac{11!}{2!2!2!}$

B. 11!

C. ${}^{11}C_1$

D. none of these

Answer: A

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27. In a group of boys, two boys are brothers and six more boys are present in the group. In how many ways can they sit if the brothers are not to sit along with each other? a.$2 \times 6!$ b. $\hat{\ } 7P_2 \times 6!$ c. $\hat{\ } 7C_2 \times 6!$ d. none of these

A. 4820

B. 1410

C. 2830

D. none of these

Answer: D

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28. Nishi has 5 coins, each of the different denomination. Find the number different sums of money she can form.

A. 32

B. 25

C. 31

D. none of these

Answer: C

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29. Write the number of ways in which 5 boys and 3 girls can be seated in a row so that each girl is between 2 boys.

A. 2880

B. 1880

C. 3800

D. 2800

Answer: A

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30. How many different nine-digit numbers can be formed from the digits of the number 223355888 by rearrangement of the digits so that the odd digits occupy even places:

A. 7560

B. 180

C. 16

D. 60

Answer: D

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31. The number of 4 digit even numbers that can be formed using 0, 1, 2, 3, 4, 5, 6 without repetition is

A. 120

B. 300

C. 420

D. 20

Answer: C

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32. The number of ways in which n ties can be selected from a rack displaying 3n different ties, is

A. $\frac{3n!}{2n!}$

B. $3 \times n!$

C. $(3n)!$

D. $\frac{3!}{n!2n!}$

Answer: D

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33. There are n-points $(n > 2)$ in each to two parallel lines. Every point on one line is joined to every point on the other line by a line segment drawn within the lines. The number of point (between the lines) in which these segments intersect, is

A. ${}^{2n}C_2 - 2.\,{}^{n}C_1 + 2$

B. ${}^{2n}C_2 - 2 \times {}^{n}C_2$

C. ${}^{n}C_2 \times {}^{n}C_2$

D. none of these

Answer: C

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34. The maximum number of points of intersection of 8 circles is

A. 16

B. 24

C. 28

D. 56

Answer: D

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35. The maximum number of points of intersection into which 4 circles and 4 straight lines intersect, is

A. 26

B. 50

C. 56

D. 72

Answer: B

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36. In a circket charmpionship there are 36 matches. The number of teams if each plays one match with other, is

A. 8

B. 9

C. 10

D. none of these

Answer: B

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37. For $4 \leq r \leq n$,

$$\binom{n}{r} + 4\binom{n}{r+1} + 6\binom{n}{r+2} + 4\binom{n}{r+3} + \binom{n}{r+4}$$

equals

A. ${}^{n+4}C_r$

B. $2.^{n+4}\,C_{r-1}$

C. $4.^{n}\,C_r$

D. $11.^{n}\,C_r$

Answer: A

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38. The total number of numbers greater than 100 and divisible by 5, that can be formed from the digits 3, 4, 5, 6 if no digit is repeated, is

A. 24

B. 48

C. 30

D. 12

Answer: D

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39. Find the number of words that can be made out of the letters of the word MOBILE when consonants always occupy odd places.

A. 20

B. 36

C. 30

D. 720

Answer: B

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40. Number of numbers greater than 24000 can be formed by using digits 1,2,3,4,5 when no digit being repeated is

A. 36

B. 60

C. 84

D. 120

Answer: C

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41. Write the number of words that can be formed out of the letters of the word COMMITTEE.

A. $\frac{9!}{(2!)^3}$

B. $\frac{9!}{(2!)^2}$

C. $\frac{9!}{2!}$

D. 9!

Answer: A

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42. How many different committees of 5 can be formed from 6 men and 4 women on which exact 3 men and 2 women serve? 6

b. 20 c. 60 d. 120

A. 6

B. 20

C. 60

D. 120

Answer: D

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43. The number of ways to rearrange the letters of the word CHEESE is

A. 120

B. 240

C. 720

D. 6

Answer: A

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44. If ${}^{k+5}P_{k+1} = \frac{11(k-1)}{2} . {}^{k+3}P_k \ P_k$ then the values of k are $7 \ and \ 11$ b. $6 \ and \ 7$ c. $2 \ and \ 11$ d. $2 \ and \ 6$

A. 7 and 11

B. 6 and 7

C. 2 and 11

D. 2 and 6

Answer: B

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45. Find the number of proper factors of the number 38808. also, find sum of all these divisors.

A. 70

B. 72

C. 71

D. none of these

Answer: A

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46. In a party 15 people shake their hands with each other. How many times did the hand-shakes take place?

A. ${}^{15}P_2$

B. ${}^{15}C_2$

C. 15!

D. $2 \times 15!$

Answer: B

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47. The number of ways in which 5 beads of different colours can be made into a necklace is

A. 12

B. 120

C. 60

D. 24

Answer: A

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48. Find number of ways that 8 beads o different colors be strung as a necklace.

A. 2520

B. 2880

C. 5040

D. 4320

Answer: A

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49. There are n points in a plane of which 'p' points are collinear.

How many lines can be formed from these points

A. ${}^{n}C_2 - {}^{p}C_2 + 1$

B. ${}^{n}C_2 - {}^{p}C_2$

C. $n - {}^{p}C_2$

D. ${}^{n}C_2 - {}^{p}C_2 - 1$

Answer: A

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50. The number of 4 digit even numbers that can be formed using 0, 1, 2, 3, 4, 5, 6 without repetition is

A. 120

B. 300

C. 420

D. 20

Answer: C

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51. The number of ways in which 21 objects can be grouped into three groups of 8, 7, and 6 objects,is

A. $\frac{20!}{8!+7!+6!}$

B. $\frac{21!}{8!7!}$

C. $\frac{21!}{8!7!6!}$

D. $\dfrac{21!}{8!+7!+6!}$

Answer: C

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52. Let L_1 and L_2 be two lines intersecting at P If A_1, B_1, C_1 are points on $L_1, A_2, B_2, C_2, D_2, E_2$ are points on L_2 and if none of these coincides with P, then the number of triangles formed by these 8 points is

A. 56

B. 55

C. 46

D. 45

Answer: D

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53. In a plane there two families of lines : y=x+r, y=-x+r, where $r \in \{0, 1, 2, 3, 4\}$. The number of the squares of the diagonal of length 2 formed by these lines is____.

A. 9

B. 16

C. 25

D. 36

Answer: C

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54. How many words can be formed out of the letters of the word, ARTICLE, so that vowels occupy even places?

A. 574

B. 36

C. 754

D. 144

Answer: D

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55. The number of ways in which 9 persons can be divided into three equal groups is

A. 1680

B. 840

C. 560

D. 280

Answer: D

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56. A dictionary is printed consisting of 7 lettered words only that can be made with letters of the word "CRICKET". If the words are printed in the alphabetical order, as in the ordinary dictionary, then the number of words before the word CRICKET, is

A. 530

B. 480

C. 531

D. 481

Answer: A

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57. The number of times the digit 5 will be written when listing the integers from 1 to 1000, is (a) 271 (b) 272 (c) 300 (d) 200

A. 271

B. 272

C. 300

D. none of these

Answer: C

58. How many numbers lying between 999 and 10000 can be formed with the help of the digit $0, 2, 3, 6, 7, 8$ when the digits are not to be repeated

A. 100

B. 200

C. 300

D. 400

Answer: C

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59. The number of different words that can be formed from the letters of the word 'PENCIL', so that no two vowels are together, is

A. 120

B. 260

C. 240

D. 480

Answer: C

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60. How many four digit numbers can be formed using digits 1, 2, 3, 4, 5 such that at least one of the number is respeated?

A. $4^4 - 5!$

B. $4^5 - 4!$

C. $5^4 - 4!$

D. $5^4 - 5!$

Answer: D

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