MATHS

BOOKS - MODERN PUBLICATION MATHS (KANNADA ENGLISH)

PERMUTATIONS AND COMBINATIONS

Multiple Choice Questions Level I

1. If ${}^{n}C_{12} = {}^{n}C_{8}$, then n is equal to :

A. 20

B. 12

C. 6

D. 30

Answer: A

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2. The number of possible outcomes when a coin is tossed 6 times is :

A. 36

B. 64

C. 12

D. 32

Answer: B

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3. The number of different four digit numbers that can be formed with the digits 2,3,4,7 and using each digit only once is :

A. 120

B. 96

C. 24

D. 100

Answer: C

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4. 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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5. Total number of words formed by 2 vowels and 3 consonants taken from 4 vowels and 5 consonants, ie equal to :

A. 60

B. 120

C. 7200

D. 720

Answer: C

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6. A five digit number divisible by 3 is to be formed using the numbers 0,1,2,3,4 and 5

without repetitions . The total number of ways this can be done is :

A. 216

B. 600

C. 240

D. 3125

Answer: A

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7. Everybody in a room shakes hand with everybody else. The total number of handshakes is 66. The total number of persons in the room is :

A. 11

B. 12

C. 13

D. 14

Answer: B

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8. The number of triangles that are formed by choosing the vertices from a set of 12 points , seven of which lie on the same line, is :

A. 105

B. 15

C. 175

D. 185

Answer: D

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9. The straight lines , l_1, l_2 and l_3 are parallel and lie in the same plane . A total number of m points are taken on l : n points on l_2 k points on l_3 The maximum number of triangle formed with vertices at these points is :

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. ${}^{m}C_3 \times {}^{n}C_3 \times {}^{k}C_3$

Answer: B

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10. The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of three parallel line intersecting another set of three parallel lines is:

A. 6

B. 18

C. 12

D. 9

Answer: B

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

A. ${}^{6}C_{11}$

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

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

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

Answer: C

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12. The number of 5- digit telephone number having at least one of their digits repeated is :

A. $90,000$

B. $10,000$

C. $30,240$

D. $69,760$

Answer: D

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13. The number of ways in which we can choose a the committee from four men and six women so that the committee includes at

least two men and exactly twice as many women as women as men is :

A. 94

B. 126

C. 128

D. None

Answer: A

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14. The total number 9- digit number Which have all different digits is :

A. $10!$

B. $9!$

C. $9 \times 9!$

D. $10! \times 10!$

Answer: C

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15. The number of words that can be formed out of the letters of the word "ARTICLE" so that the vowels occupy even places is

A. 1440

B. 144

C. $7!$

D. ${}^4C_4 \times 3C_3$

Answer: B

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16. Given 5 different green dyes , 4 different blue dyes and 3 different red dyes , the number of combinations of dyes which can be chosen taking at least one green and one blue dye is

A. 3600

B. 3720

C. 3800

D. 3600

Answer: B

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17. There are four bus routes between And B , and three bus routes between B and C. A man can travel round - trip in number of ways by bus from A and C via B . If he does not want to use a bus route more than once ,in how many ways can he make round trip ?

A. 72

B. 114

C. 14

D. 19

Answer: A

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18. In how many ways a committee consisting of 3 men and 2 women , can be chosen from 7 men and 5 women ?

A. 45

B. 350

C. 4200

D. 230

Answer: B

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19. All the latter of the word ' EAMCOT ' are arranged in different possible ways. The number of such arrangements in which no two vowels are adjacent to each other is :

A. 360

B. 144

C. 72

D. 54

Answer: B

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20. Ten different letters of alphabet are given. Words with five letters are formed from these

give letters.Then the number of words which have at least one letter repeated, is :

A. 69760

B. 30240

C. 99748

D. 99784

Answer: A

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21. The number of signals, that can be sent by 5 flags of different colours , taking one or more at a time is :

A. 63

B. 1956

C. 720

D. 21

Answer: B

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22. In an examination there are three multiple choice questions and each questions has 4 choices . Number of ways in which a students can find to get all answers correct is :

A. 11

B. 12

C. 27

D. 63

Answer: D

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23. The value of $2^n[1.3.5.....(2n-3)(2n-1)]$ is

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

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

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

D. None of these

Answer: A

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24. If

$^nC_r - 84, {}^nC_{r-1} = 36 \text{ and } {}^nC_{r+1} = 126$,

then n equals :

A. 8

B. 9

C. 10

D. 5

Answer: B

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25. The value of the expression :

$${}^{47}C_4 + \sum_{j=1}^{5} {}^{52-j}C_3$$ is equal to :

A. ${}^{47}C_5$

B. ${}^{52}C_5$

C. ${}^{52}C_4$

D. ${}^{52}C_3$

Answer: C

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26. 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

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27. There are 4 letters and 4 directed envelopes . The number of ways in which every letter is put into a wrong envelope is :

A. 8

B. 16

C. 15

D. 9

Answer: B

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28. 66 games were played in a tournament where each player is placed against the rest. The number of players is :

A. 33

B. 12

C. 13

D. 11

Answer: B

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29. A lady gives dinner party to six guests . The number of ways in which they may be selected from among ten friends if two of the friends , will not attend the party together is :

A. 112

B. 140

C. 164

D. None of these

Answer: B

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30. All the letters of the Word " AGAIN " are permuted in all possible ways and the words so formed (With or Without meaning) are written as in dictionary , then the 50th word is :

A. NAAGI

B. NAAIG

C. IAANG

D. INAGA

Answer: B

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31. The number of different arrangements, which can be made from the letters of the word " SERIES " , taken all together is :

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

B. $\frac{6!}{4!}$

C. $6!$

D. None of these

Answer: A

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32. There are 15 points in a plane , no three of which are in a st line , except 6 , all of which are in a st. line The number of st lines , which can be drawn by joining them is :

A. ${}^{5}C_{2} - 6$

B. ${}^{15}C_{2} - {}^{6}C_{2}$

C. ${}^{15}C_{2} - {}^{6}C_{2} - 1$

D. ${}^{15}C_2 - {}^{6}C_2 + 1$

Answer: D

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33. There are $n(>2)$ points in each of 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 points (between the lines) in which these segments intersect is :

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

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

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

D. None of these

Answer: C

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34. There are 16 points in a plane no three of which are in a st , line except except 8 which

are all in a st . Line The number of triangles that can be formed by joining them equals :

A. 504

B. 552

C. 560

D. 1120

Answer: A

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35. Number of ways in which 6 persons can be seated around a circular table so that two particular persons are never seated together , is equal to :

A. 480

B. 72

C. 120

D. 240

Answer: B

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36. A convex polygon has 44 diagonals. Find the number of sides.

A. 11

B. 10

C. 22

D. 13

Answer: A

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37. Number of diagonals in a polygon of m sides is :

A. $\frac{1}{2!}m(m-5)$

B. $\frac{1}{2!}m(m-1)$

C. $\frac{1}{2!}m(m-3)$

D. $\frac{1}{2!}m(m-2)$

Answer: C

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38. Number of divisors of the form $4n + 2(n \geq 0)$ of integer 240 is :

A. 4

B. 8

C. 10

D. 3

Answer: D

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39. In an examination there are three multiple choice questions and each questions has 4 choices . Number of ways in which a students can fail to get all answers correct is :

A. 11

B. 15

C. 80

D. 63

Answer: D

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40. The number of different four - digit numbers that can be formed with the digits 2,3,4,5,7 , using each digit only once, is :

A. $4!$

B. $4(4!)$

C. $5!$

D. $5(7!)$

Answer: C

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41. The number of ways in which 10 persons can go in two boats , so that there may be 5 on each boat, supposing that two particular persons will not go in the same boat, is :

A. $\frac{1}{2}\left({}^{10}C_5\right)$

B. $\frac{1}{2}\left({}^{8}C_5\right)$

C. $2 \times {}^{8}C_4$

D. ${}^{8}C_4$

Answer: C

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42. In a cricket championship 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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43. 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

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44. The number of ways in which 6 boys and 6 girls can sit alternatively is :

A. 518400

B. 1036800

C. 508400

D. None of these

Answer: B

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45. If x is an integer between 0 and 21, then the minimum value of $x!(2l-x)!$ is :

A. $9!12!$

B. $10!11!$

C. $20!$

D. $21!$

Answer: B

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46. 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

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47. A father with 8 children takes 3 at a time to a Zoological Garden as often as he can without taken same three children together more than once, The number of times :

Each child will go to the garden is :

A. 56

B. 21

C. 112

D. None of these

Answer: B

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48. A father with 8 children takes 3 at a time to a Zoological Garden as often as he can without taken same three 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

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

A. 10^2

B. 1023

C. 2^{10}

D. $10!$

Answer: B

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50. Seven women and seven men are to sit round a circular table such that there is a man

on either side of every woman , the number of seating arrangements is :

A. $(7!)^2$

B. $(6!)^2$

C. $6! \times 7!$

D. $7!$

Answer: B

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51. The number of different words ending and beginning with a consonant which can be made out of the letters of the word " EQUATION " is :

A. 5200

B. 4320

C. 1295

D. 3000

Answer: B

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52. Let A be a set containing 10 distinct elements . Then the total number of distinct functions from A to A is :

A. $10!$

B. 10^{10}

C. 2^{10}

D. $2^{10} - 1$

Answer: B

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53. From 4 officers and 8 jawans, a committee of 6 is to be chosen to include exactly one officer. The number of such committees is :

A. 160

B. 200

C. 224

D. 300

Answer: C

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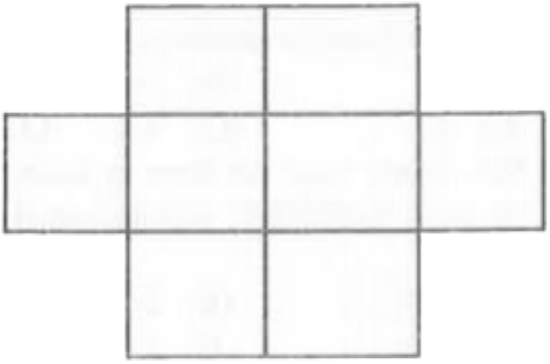
54. Six X ' s have to be placed in the squares of the figure given below such that each row contains at least one X . Th number of ways in which this can be done is :



A. 26

B. 27

C. 22

D. None of these

Answer: A

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55. Let A = { x : x is a prime number and $x < 30$ } 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: C

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56. There are three coplanar lines. If any p points are taken on each of the lines , the

maximum number of triangles with vertices at these points is :

A. $3p^2(p-1)+1$

B. $3p^2(p-1)$

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

D. None of these

Answer: C

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57. The number of ways in which the letters of the word " ARRANGE " can be arranged such that both R do not come together is :

A. 360

B. 900

C. 1260

D. 1620

Answer: B

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58. In a circus there are 10 cages for accommodating 10 animals. Out of these 4 cages are so small that 5 out of 10 animals cannot enter into them . In how many will it be possible to accommodate 10 animals in these 10 cages ?

A. 66400

B. 86400

C. 96400

D. None of these

Answer: B

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59. A is a set containing n elements. A subset P of A is chosen . The set A is reconstructed by replacing the elements of P.A subset Q of A is again chosen . The number of ways of choosing P and Q so that $P \cap Q = \phi$ is :

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

B. 2^n

C. $2^n - 1$

D. 3^n

Answer: B

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60. How many different nine - digit numbers can be formed from the number 223355888 by rearranging its digits so that the odd digit occupy even positions ?

A. 16

B. 36

C. 60

D. 180

Answer: C

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61. Two straight lines intersect at a point O. Points $P_1, P_2, \ldots\ldots\ldots\ldots, P_n$ on the other . Ithe point O is not to be used, the number of

triangles that can be drawn using these points as vertices is :

A. $n(n-1)$

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

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

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

Answer: A

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62. The number of proper divisors of 1800, which are also divisible by 10, is :

A. 18

B. 34

C. 27

D. None of these

Answer: A

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63. Let $a_n = \frac{10^n}{n!}$ for $n \geq 1$ Then a_n takes the greatest value when :

A. n = 10

B. n = 8

C. n = 11

D. n = 12

Answer: A

Watch Video Solution

64. How many different nine - digit numbers can be formed from the number 223355888 by rearranging its digits so that the odd digit occupy even positions ?

A. 16

B. 36

C. 60

D. 180

Answer: C

Watch Video Solution

Watch Video Solution

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

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

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

C. $2\binom{n+2}{1}$

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

Answer: D

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66. 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

Answer: A

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67. Let T_n denote the number of triangles which can be formed using the vertices of a regular polygon of n sides . If $T_{n+1} - T_n = 21$, then n equals :

A. 5

B. 7

C. 6

D. 4

Answer: B

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

A. 30

B. $5! \times 4!$

C. $7! \times 5!$

D. $6! \times 5!$

Answer: D

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69. A student is to answer 10 out of 13 questions in an examination such that he must choose at least 4 from the first five questions . The number of choices available to him is :

A. 196

B. 280

C. 346

D. 140

Answer: A

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70. If ${}^nC_r$ denotes the number of combinations of n things , taken r at a time , then the expression : ${}^nC_{r+1} + {}^nC_{r-1} + 2{}^nC_r$ equals :

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

B. ${}^{n+2}C_r$

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

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

Answer: C

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71. If ${}^{n-1}C_r = \left(k^2 - 3\right){}^{n}C_{r+1}$, then $k \in$:

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

B. $(2, \infty)$

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

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

Answer: D

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72. If $s_n = \sum_{r=0}^{n} \frac{1}{{}^nC_r}$ and $t_n = \sum_{r=0}^{n} \frac{r}{{}^nC_r}$, then $\frac{t_n}{s_n}$ is equal to :

A. $n-1$

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

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

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

Answer: C

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

A. 3^8

B. 21

C. 5

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

Answer: B

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

A. 120

B. 240

C. 360

D. 480

Answer: A

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

A. ${}^{55}C_3$

B. ${}^{55}C_4$

C. ${}^{56}C_4$

D. ${}^{56}C_3$

Answer: C

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76. 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 :

A. 600

B. 601

C. 602

D. 603

Answer: B

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Multiple Choice Questions Level Ii

1. If ${}^{2n}C_3 : {}^{n}C_2 = 44:3$, then for which of the following values of r, the value of ${}^{n}C_r$ will be 15 ?

A. r = 3

B. r = 4

C. r = 6

D. r = 5

Answer: B

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2. If x, y and r are positive integers , then :

$$^{x}C_{r} + {}^{r}C_{r-1}{}^{y}C_{1} + {}^{x}C_{r-2}{}^{y}C_{2} + \dots\dots\dots + {}^{y}C_{r}$$

=

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

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

C. $^{x+y}C_{r}$

D. $^{xy}C_{r}$

Answer: C

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3. The number of positive integers satisfying the inequality : ${}^{n+1}C_{n-2} - {}^{n+1}C_{n-1} \leq 100$ is :

A. 9

B. 8

C. 5

D. 7

Answer: B

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4. How many words can be formed by taking four different letters of the word ' MATHEMATICS " ?

A. 756

B. 1680

C. 2454

D. 18

Answer: C

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5. The exponent of 3 in (100) ! Is :

A. 33

B. 44

C. 48

D. 52

Answer: C

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

A. 18

B. 108

C. 432

D. 144

Answer: B

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7. A five digit number divisible by 3 is to be formed using the numbers 0,1,2,3,4 and 5 without repetitions . The total number of ways in which this can be done is

A. 216

B. 600

C. 240

D. 3125

Answer: A

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8. 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

Answer: B

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9. A parallelogram is cut by two sets of m lines parallel to the sides. The number of parallelograms thus formed is

A. $\frac{m^2}{4}$

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

C. $\frac{(m+2)^2}{4}$

D. $\frac{(m+1)^2+(m+2)^2}{4}$

Answer: D

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10. Number of different arrangements which can be made out of the letters in the expansion of $A^2B^3C^4$, when written in full , is

,

A. $\frac{9}{2!3!4!}$

B. $2!3!4!(2!3!4!)$

C. $2!3! - 4$

D. $\frac{9!}{2! + 3! + 4!}$

Answer: A

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11. The maximum number of points into which 4 circles and 4 st . Lines intersect is :

A. 26

B. 56

C. 50

D. 72

Answer: C

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12. A box contains two white balls, three black balls and four red balls. The number of ways in which three balls can be drawn from the box so that least one of the balls is black is :

A. 74

B. 84

C. 64

D. 20

Answer: C

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13. There are n books having p copies of each . The number of ways in which a selection can be made from them is :

A. n^p

B. p^n

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

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

Answer: C

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14. Ten different letters of an alphabet are given . Words with five letters are formed from

these given letters. Then the number of wards which have at least one letter repeated is :

A. 69760

B. 30240

C. 99748

D. None of these

Answer: A

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15. m parallel lines in a plane are intersected by a family of n parallel lines. The total number of parallelograms so formed is :

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

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16. 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 the books is 63, then n is :

A. 6

B. 3

C. 4

D. None of these

Answer: B

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17. The sides AB, BC BC, CA of triangles ABC have 3 4 and 5 interior points respectively on them . The toal number of triangles that can be constructed by using these points as vertices is :

A. 220

B. 204

C. 205

D. 195

Answer: C

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18. How many number 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. $5 \times^{8} P_3$

B. $5 \times^{8} P_8$

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

D. $5! \times {}^{8}C_{3}$

Answer: A

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19. If the letters of the word " RACI II T " are arranged in all possible ways and these words written out as in a dictionary , then the rank of the word ' RACHIT' is :

A. 365

B. 481

C. 702

D. None of these

Answer: B

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20. Let A be the set of 4 - digit numbers abcd, where $a > b > c > d$, then n (A) equals :

A. 126

B. 84

C. 210

D. None of these

Answer: C

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21. 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 finds a place is :

A. 10

B. 12

C. 14

D. 16

Answer: D

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22. Number of odd proper divisors of $3^p.6^m.21^n$ is :

A. (p+1) (m+1) (n+1) -2

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

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

D. None of these

Answer: D

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23. Sum of divisors of $2^5.3^7.5^3.7^2$ is :

A. $2^6.3^8.5^4.7^8$

B. $2^6.3^8.5^4.7^3 - 2.3.5.7$

C. $2^6.3^8.5^4.7^3 - 1$

D. None of these

Answer: D

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24. Eight chairs are numbered 1 to 8.Two women and three men wish to occupy one chair each . First the women choose the chair

from the remaining chairs. The number of possible arrangements is :

A. ${}^6C_3 \times {}^4C_2$

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

C. ${}^4P_2 \times {}^6P_3$

D. None of these

Answer: C

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

A. 8

B. 7

C. 9

D. None of these

Answer: C

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26. In a city no two person have identical set of teeth and there is no person without a tooth. Also no person has more than 32 teeth. If two disregard the shape and size of tooth and consider only the positioning of the teeth, then the maximum population of the city is :

A. 2^{32}

B. $(32)^2 - 1$

C. $2^{32} - 1$

D. 2^{32-1}

Answer: C

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27. Number of non - negative integral solutions of $a + b + c + d = n, n \in N,$ is :

A. ${}^{n+3}P_2$

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

C. ${}^{n+1}P_{n-4}$

D. None of these

Answer: B

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28. The straight lines , l_1, l_2 and l_3 are parallel and lie in the same plane . A total number of m points are taken on l : n points on l_2 k points

on l_3 The maximum number of triangle formed with vertices at these points is :

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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29. Seven different lecturers are to deliver lectures in seven periods of a class on a particular day X,Y and Z are three of the lecturers . The number of ways in which a routine for the day can be made such that X delivers his lecture before Y and Y before Z , is :

A. 420

B. 120

C. 210

D. None of these

Answer: D

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30. A shop keeper 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 a 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

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31. On a railway there are 20 stations. The number of different tickets required in order that it may be possible to travel from every station to every station is :

A. 196

B. 105

C. 210

D. 225

Answer: C

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32. The sum of all 4 digit number that can be formed by using the digits 2,4,6,8 (repetition of digits no allowed) is :

A. 133320

B. 533280

C. 53328

D. None of these

Answer: A

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33. The greatest common divisor of :

${}^{31}C_{16}, {}^{31}C_{17}, \ldots\ldots\ldots\ldots, {}^{31}C_{30}$ is :

A. ${}^{31}C_{16}$

B. 31

C. 465

D. None of these

Answer: B

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34. Mr. P has m children from his first wife and Mrs. Q has m + 1 children by her first husband. They marry and have children of their own . The whole family has 10 children . Assuming that two children of the same parents do not fight , the maximum number of fights that can take place among children is :

A. 33

B. 35

C. 38

D. None of these

Answer: A

Watch Video Solution

35. Five distinct letters are to be transmitted through a communication channel. A total number of 15 blanks is to be inserted between the two letters with at least three between every two. The number of ways in which this can be done is :

A. 1200

B. 1800

C. 2400

D. 3000

Answer: C

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36. All the letters of the word ' EAMCET " are arranged in all possible ways. The number of

such arrangements in which two vowels are adjacent to each other is :

A. 360

B. 144

C. 72

D. 54

Answer: C

Watch Video Solution

37. The different letters of alphabet are given words with five letters are for med from these give letters . The number of word which have at least one latter repeated is :

A. 69760

B. 30240

C. 99748

D. 43929

Answer: A

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38. The number of ways in which four particular persons A,B,C,D and six more persons can stand in a queue so that A always stands before B,B before C and C before D , is :

A. $7!4!$

B. $10! - 7!4!$

C. $\frac{(10)!}{4!}$

D. None of these

Answer: C

Watch Video Solution

39. The total number of arrangements of the letters in the expansion $a^3b^2c^4$ when written at full length is :

A. 1260

B. 2520

C. 610

D. None of these

Answer: A

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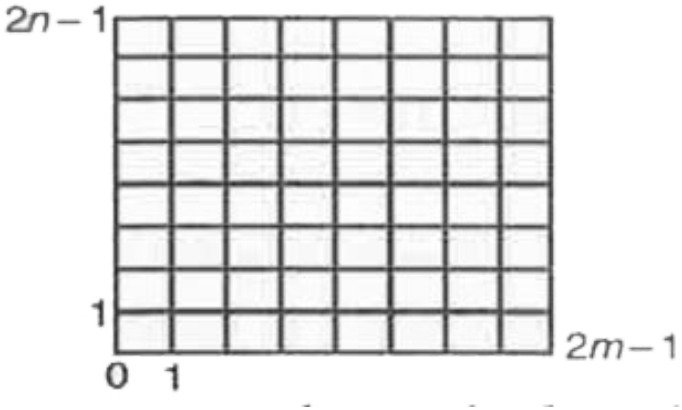
40. There are 2m horizontal lines equispaced at unit distance and 2n vertical lines equi-spaced at unit distance .



How many rectangles can be formed such that the length of their sides is odd ?

A. 4^{m+n-2}

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

C. m^2n^2

D. $m(m+1)n(n+1)$

Answer: C

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41. At an election , a voter may vote for any number of candidates , not greater than the number to be elected . There are 10 candidates and 4 are to be elected , If a voter votes for at least one candidates, then the number of ways in which he can vote is :

A. 5040

B. 6210

C. 385

D. 1110

Answer: C

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42. The letters of the word ' COCHIN ' are permuted and all permutations are arranged in an alphabetical order as in an english dictionary . The number of words that appear before the word ' COCHIN ' is :

A. 360

B. 192

C. 96

D. 48

Answer: C

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

A. $7.^{6}C_{4}.^{8}C_{4}$

B. $8.^{6} C_{4}.^{7} C_{4}$

C. $6.7.^{8} C_{4}$

D. $6.8.^{7} C_{4}$

Answer: A

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44. .The number of ordered triplets of positive integers which are solutions of the equation $x + y + z = 100.$

A. 5081

B. 6005

C. 4851

D. 4987

Answer: C

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45. The number of ways in which 8 different flowers can be strung to form a garland so

that 4 particular flowers are never separated is

:

A. $4!4!$

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

C. 288

D. None of these

Answer: A

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46. The sum of al the numbers that can be formed with the digits 2,3,4,5 , taken all at a time is :

A. 66666

B. 84844

C. 93324

D. None of these

Answer: C

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47. 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. $\frac{5(7!)}{2}$

B. $\frac{3(7!)}{2}$

C. $2(7!)$

D. None of these

Answer: A

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48. If the letters of the word KRISNA are arranged in all possible ways and these word 23 written out as in a dictionary, then the rank of the word KRISNA is

A. 324

B. 341

C. 359

D. None of these

Answer: A

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49. The number of ways in which four letters of the word " MATHEMATICS " can be arranged is given by :

A. 136

B. 192

C. 1680

D. 2454

Answer: D

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50. Number of positive integral solutions of :

$x_1x_2x_3 = 30$ is

A. 25

B. 26

C. 27

D. 28

Answer: C

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51. If x,y,z are integers 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. ${}^{7}C_{15}$

D. None of these

Answer: A

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52. Sum of non - negative integral solutions of :

$x_1 + x_2 + ... + x_n \leq x$ (where n is +ve integer) is :

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

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

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

D. ${}^{n+4}C_6$

Answer: B

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53. There are n straight lines in a plane, no two of which are parallel, and no three pass through the same point . Their points of

intersection are joined . Then the number of fresh lines thus obtained is :

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

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

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54. In the next World Cup there will be 12 teams , divided equally in two groups . Teams of each group will play a match against each other. From each group 3 top teams will qualify for the next round. In this round , each team will play against others once . Four top teams of this round will qualify for the semi - final round , where each team will play against the others once. Two top teams of this round will go to the final round , where they will play the best of three matches . The minimum

number of matches in the next World Cup will be :

A. 54

B. 53

C. 38

D. None of these

Answer: B

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55. Passengers are to travel by a double decked bus which can accommodate 13 in upper deck and 7 in the lower deck. The number of ways that they can be distributed if 5 refuse to sit in the upper desk and 8 refuse to sit in the lower deck is :

A. 25

B. 21

C. 18

D. 15

Answer: B

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56. There are p,q,r points on three parallel lines L_1, L_2 and L_3 respectively, all of which lie in one plane . The number of triangle which can be formed with vertices at these points is :

A. ${}^{p+q+r}C_3$

B. ${}^{p+q+r}C_3 - {}^{p}C_3 - {}^{q}C_3 - {}^{r}C_3$

C. ${}^{p}C_3 + {}^{q}C_3 + {}^{r}C_3$

D. None of these

Answer: B

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57. If 'P' is a prime number such that $p \geq 23$ and $n + p! + 1$, then the number of primes in the list $n + 1, n + 2, \ldots\ldots, n + p - 1$ is

A. $p - 1$

B. 2

C. 1

D. None of these

Answer: D

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58. If a, b,c are three rational numbers in A.P. and a +b+c = 21 , 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: C

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59. If $a_n = \sum_{r=0}^{n} \frac{1}{{}^nC_r}$, then $\sum_{r=0}^{n} \frac{r}{{}^nC_r}$ equals :

A. $(n-1)a_n$

B. na_n

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

D. None of these

Answer: C

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60. The number of seven digit integers 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: C

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61. From 6 different novels and 3 different dictionaries , 4 novels 1 dictionary are to be selected and arranged in a row on a shelf so

that the dictionary is always in middle. Then the number of such arrangement 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: D

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1. There are two urns. UrnA 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 way in which this can be done is :

A. 3

B. 36

C. 66

D. 108

Answer: D

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2. 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. $N \leq 100$

B. $100 < N < 140$

C. $140 < N \leq 190$

D. $N > 190$

Answer: A

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3. The total number of ways in which 5 balls of different colours can be distributed among 3 person so that each person gets at least one ball is :

A. 75

B. 150

C. 210

D. 243

Answer: B

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4. Assuming the balls to be identical except for difference in colours , the number of ways in which one or more balls be selected from 10 white , 9 green and 7 black balls is :

A. 880

B. 629

C. 630

D. 879

Answer: D

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5. Let T_n be the number of all possible triangles formed by joining vertices of an n - sided regular polygon . If $T_{n+1} - T_n = 10$, then the value of n is :

A. 5

B. 10

C. 8

D. 7

Answer: B

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6. The number of integers greater than 6,000 that can be formed , using the digits 3,5,6,7 and 8, without repetition is :

A. 216

B. 192

C. 120

D. 72

Answer: B

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Recent Competitive Questions

1. How many 5 digit telephone numbers can be constructed using the digits 0 to 9, if each number starts with 67 and no digit appears more than once ?

A. 336

B. 337

C. 335

D. 338

Answer: A

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2. The sum of non - prime positive divisors of 450 is :

A. 1209

B. 1299

C. 1199

D. 1099

Answer: C

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3. The number of triangles in a complete graph with 10 non - collinear vertices is :

A. 360

B. 240

C. 120

D. 60

Answer: C

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4. Given 5 line segments of lengths 2,3,4,5,6 units. Then the number of triangles that can be formed by joining these segments is :

A. ${}^5C_3 - 3$

B. ${}^5C_3$

C. ${}^5C_3 - 1$

D. ${}^5C_3 - 2$

Answer: A

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5. How many number greater than 10,00,000 be formed from 2,3,0,3,4,2,3 ?

A. 420

B. 360

C. 400

D. 300

Answer: B

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6. The remainder obtained when $1! + 2! + 3! + \ldots. + 11!$ is divided by 12 is _____

A. 9

B. 8

C. 7

D. 6

Answer: A

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