MATHS

BOOKS - NEW JYOTHI MATHS (TAMIL ENGLISH)

PERMUTATIONS AND COMBINATIONS

Examples

1. Simplify $\dfrac{{}^{n}P_4}{{}^{n-1}P_3}$

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2. How many 4-digit numbers can be formed by using the digits 1 to 9 if repetition of digits is not allowed?

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3. How many 4-digit numbers are there with no digit repeated?

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4. If $\dfrac{1}{8!} + \dfrac{1}{9!} = \dfrac{x}{10!}$, find x

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5. How many different signals can be generated from 6 flags of different colours if each signal makes use of all the flags at a time, placed one below the other?

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6. In how many ways, can the letters of the word "HEXAGON" be permuted?

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7. The letters of the word TUESDAY are arranged in a line, each arrangement ending with letter S. How many different arrangements are possible? How many of them start with letter D?

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8. In how many ways can the letters of the word ENGLISH be arranged if

i. all the letters are used at a time

ii. Words start with E and end in H

9. There are 10 examination papers for a course.

i. Find out in how many ways these examination papers can be arranged.

ii. Find out in how many ways these papers can

be arranged so that two papers must be consecutive.

iii. Find out in how many was these papers can be arranged so that two particular papers should not be consecutive.

10. i. How many 4 digit number can be formed using the digits 3, 5, 8, 9 if repetition is not allowed?

ii. How many of these numbers end in 3?

iii. How many of the above numbers mentioned in (i) ends in 3 or 5?

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11. Find n if $^{n-1}P_3 : {}^nP_4 = 1 : 9$.

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12. Iff $^5P_r = {}^6P_{r-1}$ find r.

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13. Find the value of n such that $^nP_5 = 42.\ ^nP_3, n > 4.$

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14. If the letters of word "EQUATION" are arranged, find the number of arrangements in which no two consonants are adjacent.

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15. In the different 8 letter arrangement of the word 'DAUGHTER'

i. Find the number of words in which all vowels occur together.

ii. In the above arrangement, find the number of words in which all vowels do not occur together.

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16. a. Find the number of words that can be formed from the letters of the word

MALAYALAM.

b. How many of these arrangemnets start with Y?

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17. In how many ways can 4 red, 3 yellow and 2 green discs be arranged in a row if the discs of the same colour are indistinguishable?

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18. How many numbers greater than 1000000 can be formed by using the digits 1, 2, 0, 2, 4, 2, 4?

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19. How many 3-digit numbers can be formed by using the digits 1 to 9 if no digit is repeated?

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20. Find the number of 4-digit numbers that can be formed using the digits 1,2,3,4,5 if no digit is repeated. How many of these will be even ?

21. How many words, with or without meaning, can be formed using all the letters of the word EQUATION, using each letter exactly once?

22. In how many of the distinct permutations of the letters in MISSISSIPPI do the four I' s not come together?

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23. In how many ways can one choose 5 books from 10 different books?

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24. If there are 12 persons in a party and each of them shake hands with all others, what is the total number of handshakes?

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25. Determine the number of 5 card combinations out of a deck of 52 cards if there is exactly three aces in each combination .

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26. A student is instructed to answer 8 out of 12 questions.

i. How many differnet ways can he choose the questions?

ii. How many different ways can he choose the questions so that question number 1 will be included?

iii. How many different ways can he choose the questions so that question number 1 will be included and question number 10 will be excluded?

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27. In how many ways can a committee of 3 men and 2 women be selected out of 7 men and 5 women?

28. In how many ways can a committee of 3 men and 2 women be formed from a group of 5 men and 4 women if Mr. A is always included and Mrs. B is never included?

29. A committee of 3 persons is to be constituted from a group of 2 men and 3 women.

a. In how many ways can this be done?

b. How many of these committees would consist of 1 man and 2 women?

30. In how many ways can a team of 3 boys and 3 girls be selected from 5 boys and 4 girls?

31. A committee of 7 peoples has to be formed from 9 men and 4 women . In how many can this be done when then committee consists of

(i) exactly 3 women ?

(ii) at least 3 woman ?

(iii) at most 3 women ?

32. From 8 consonants and 4 vowels, how many words can be made each consisting of 2 consonants and 3 vowels?

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33. How many chords can be drawn through 21 points on a circle?

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34. The magnitude and direction of the acceleration of a body are constant. Will the path of the body necessarily be a straight line ?

35. A polygon has 12 vertices lying on a circle. Find the number of diagonals.

36. A bag contains 5 black and 6 red balls. Determine the number of ways in which 2 black and 3 red balls can be selected from lot.

37. A committee of 5 persons is to be formed from 7 men and 3 women.

i. Find the number of ways to form the committee so that it contains 5 men.

ii. Find the number of ways to form the committee so that it contains 4 men and 1

women.

iii. Find the number of ways to form the committee so that it contains atleast 1 women.

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38. Find the value of $6P5$.

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39. Find the number of words with or without meaning which can be made using all letters of

the word 'AGAIN'. If these words are written as in a dictionary, what will be the 50th word?

40. Find the value of $5P4$.

41. How many 6-digit numbers can be formed from the digits 0, 1, 3, 5, 7 and 9 which are divisible by 10 and no digit is repeated?

42. The English alphabet has 5 vowels and 21 consonants. How many words with two different vowels and 2 different consonants can be formed from the alphabet?

Exercise

1. If $^nP_r = 110$, then n + r =

A. 21

B. 19

C. 13

D. 11

Answer: C

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2. Find the value of $8P1$.

3. Find the value of $6P1$.

4. The number of words formed using the letters of the word 'ARTICLE' is

   A. 6!

   B. 8!

C. 7!

D. 5!

Answer: C

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5. The number of ways of arranging 6 books in

a shelf is

A. 180

B. 720

C. 120

D. 24

Answer: B

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6. The number of words formed using the letters of the word 'ARTICLE' beginning with A is

A. 5!

B. 7!

C. 6!

D. 8!

Answer: C

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7. The number of permutations of the letter of the word 'CONSEQUENCE' is

A. 11!

B. $\dfrac{11!}{2!3!}$

C. $\dfrac{11!}{2!2!3!}$

D. $\dfrac{11!}{2!+2!+3!}$

Answer: C

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8. The number of arrangements of the letters of the word 'ASSASSINATION' is

A. 13!

B. $\dfrac{13!}{3!4!(2!)^2}$

C. $\dfrac{13!}{11!}$

D. $\dfrac{13!}{(3! + 4! + 2! + 2!)}$

Answer: B

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9. The total number of 5 digit numbers formed using the digits 1, 2, 3, 4, 5 if the digits are not repeated is

A. 5!

B. 4!

C. 5^5

D. 6!

Answer: A

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10. The total number of 5 digit numbers formed using the digits 2, 4, 6, 7, 8 if the digits are no repeated is

A. 5!

B. 5^5

C. 6!

D. 5^2

Answer: B

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11. The number of ways in which a couple can sit with 10 guests in a row if the couple takes consecutive seats is

A. 12!

B. $12! \times 2!$

C. 10!

D. $11! \times 2!$

Answer: D

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12. The number of ways in which 7 boys and 3 girls may be arranged in a row so that the girls may be together is

A. $10! \times 3!$

B. $7! \times 3!$

C. $8! \times 3!$

D. $10!$

Answer: C

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13. The number of ways in which a 7 people can sit around a round table is

A. 7!

B. 6!

C. 42

D. 5!

Answer: B

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14. The number of ways in which 7 people can sit around a table if two persons take consecutive seats is

A. 6!

B. 7!

C. 5! × 2!

D. 6! × 2!

Answer: C

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15. C (18, r) = C (18, r + 2). Then C(r, 5) =

A. 56

B. 21

C. 126

D. 6

Answer: A

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16. $C(13, 5) =$

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17. $C(13, 4) =$

> ▶ **Watch Video Solution**

18. $C(10, 9) =$

> ▶ **Watch Video Solution**

19. $C(15, 12) =$

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20. The number of ways of selecting 6 objects from eight objects is

21. The total number of ways of selecting 3 balls from a bag containing 7 balls is

A. $7P_3$

B. 71

C. 31

D. $7C_3$

Answer: D

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22. The total number of ways of selecting a team of 3 men and 4 women from 5 men and 6 women is

A. $^5C_3 \times {}^6C_4$

B. $^{11}C_7$

C. $^5P_3 \times {}^6P_4$

D. $^{11}P_7$

Answer: A

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23. The value of

$${}^nP_1 + \frac{{}^nP_2}{2!} + \frac{{}^nP_3}{3!} + \ldots\ldots + \frac{{}^nP_n}{n!}$$

A. 2^n

B. $2^n + 1$

C. $2^n - 1$

D. 2^{n-1}

Answer: C

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24. The number of ways of selecting 3 objects from eight object is

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25. A candidate is required to answer 7 questions out of 12 questions, which are divided into two groups, each containing 6 questions. He is not permitted to attempt more than 5 questions from each group. Number of ways choosing 7 questions is

26. The number of diagonals in a polygon of seven sides is

A. 14

B. 21

C. 32

D. 35

Answer: A

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27. A polygon has 77 diagonals. The number of sides of the polygon is

A. 14

B. 9

C. 10

D. 11

Answer: A

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28. If a set of m paralled lines intersect another

set of n parallel lines (not parallelto the

lines in the first set), then find the number of parallelograms fromed in this lattice structure.

A. mn

B. $C(m, 2) \times C(n, 2)$

C. $C(m, 2) + C(n, 2)$

D. $C(m + , 4)$

Answer: B

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29. Everybody in a room shakes hands with everybody else. The total number of shake hands is 66. The number of persons in the room is

A. 11

B. 12

C. 13

D. 14

Answer: B

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30. There are 10 points in a plane no three of which are collinear except 4 of them which lie on a line. The number of straight lines determined by them is

A. 45

B. 40

C. 38

D. 39

Answer: B

31. There are 10 true or false questions in an examination. Number of ways of answering these 10 questions which are marked either T or F is

32. In an examination there are 4 multiple choice questions and each question has four

choices of which only one is correct. Number of ways in which a student fails to get all the answers correct, if he had attempted all the questions is

A. 256

B. 64

C. 63

D. 255

Answer: D

33. The number of ways in which 19 different objects can be divided into two groups of 13 and 6 is

A. $^{19}C_{13}$

B. 19 + 13

C. 19×13

D. $^{19}C_{13} + {}^{19}C_{6}$

Answer: A

34. The number of ways in which 12 people may be divided into three sets of equal size is

35. The number of ways in which 10 people can be assigned to two triple and two double rooms is

A. $\dfrac{10!}{3!2!}$

B. $\dfrac{10!}{(3!)^2(2!)^2}$

C. $\dfrac{10!}{6!4!}$

D. $P(10, 3) \times P(4, 2)$

Answer: B

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36. The vertices of a triangle are at the vertices of an octagon. The number of such triangles are

A. 40

B. 45

C. 36

D. 56

Answer: D

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37. The number of rectangles in the following

figure is

A. 5×5

B. $^5P_2$

C. $^5C_2$

D. $^5C_2 \times {}^5C_2$

Answer: D

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38. The number of ways in which 11 identical pencils can be distributed among 6 kids each receiving atleast one is

39. The number of positive integral solutions of the equation x + y + z = 100 is

A. 5081

B. 6005

C. 4851

D. 5851

Answer: C

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40. The number of whole number solutions of x + y + z = 20 is

A. 231

B. 230

C. 232

D. 234

Answer: A

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41.

$A = \{(x, y, z) : x, y, z \in N \text{ and } x + y + z = 12\}$

. The number of elements in A is

A. 54

B. 55

C. 7

D. 12^3

Answer: B

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42. A box contains two white balls, three black balls and four balls. In how many ways can three balls be drawn from the box, if atleast one black ball is to be included in the draw ?

A. 84

B. 64

C. 6

D. 20

Answer: C

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43. The number of ways in which 21 objects can be grouped into three groups 8, 7 and 6 object is

A. $\dfrac{2!}{8!7!}$

B. $\dfrac{20!}{8! + 7! + 6!}$

C. $\dfrac{2!}{8! + 7! + 6!}$

D. $\dfrac{21!}{8! + 7! + 6!}$

Answer: C

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44. The number of ways in which a couple can sit around a table with 6 guests if the couple takes consecutive seats is

45. A tea party is arranged for 16 people among two sides of a long table with 8 chairs on each side. Four men wish to sit on one particular side and two on the other side. The number of ways they can be seated is

A. $^{6}C_{8}.8!$

B. $^{10}C_{4}.8!$

C. $^{16}C_{4}.(8!)^{2}$

D. $^{10}C_4.^6C_6.(8!)^2$

Answer: D

46. There are 3 copies each of 4 different books. The number of ways in which they can be arranged in a shelf is

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

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

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

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

Answer: A

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47. The number of ways in which we can choose two positive integers from 1 to 100 such that their product is a multiple of 3 is

A. $^{100}C_2 - {}^{33}C_2$

B. $^{100}C_2 - {}^{67}C_2$

C. $^{33}C_2$

D. $^{100}C_2$

Answer: B

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48. The number of positive integral solutions of

the equation xyz = 30 is

A. 24

B. 25

C. 26

D. 27

Answer: D

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49. The total number of ways of selecting 3 balls from a bag containing 7 balls is

A. $^{31}C_{20} - {}^{21}C_{10}$

B. $^{31}C_{21}$

C. $^{31}C_{20}$

D. $^{31}C_{21} + {}^{31}C_{20}$

Answer: A

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50. If a set of m paralled lines intersect another set of n parallel lines (not parallelto the lines in the first set), then find the number of parallelograms fromed in this lattice structure.

A. $^nC_2 \times {}^nC_2$

B. $^{n+1}C_2 \times {}^{n+1}C_2$

C. $^nC_2 \times {}^{n+1}C_2$

D. $^{n+2}C_2 \times {}^{n+2}C_2$

Answer: D

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51. The number of 3 digit number locks having none of their digits repeated is

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52. m' men and 'n' women are to be seated in a row so that no two women sit next to each other. If $m \geq n$ then the number of ways in which this can be done is

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

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

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

D. m!n!

Answer: C

53. There are 'n' different books and '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

54. $^{15}C_0 =$

55. If $^{18}C_{15} + 2\left(^{18}C_{16}\right) + ^{17}C_{16} + 1 = {}^{n}C_3,$

then n =

    A. 19

    B. 20

C. 18

D. 24

Answer: B

56. If $m = {}^{n}C_2$, then ${}^{m}C_2 =$

A. $3. {}^{n}C_4$

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

C. $3. {}^{n+1}C_4$

D. $3.\ ^{n+1}C_3$

Answer: C

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57. The number of arrangements of the letters

of the word BHARAT taking 3 at a time is

A. 14

B. 28

C. 36

D. 72

Answer: D

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58. The number of all possible squares in a chess board is

A. 65

B. 64

C. 275

D. 204

Answer: D

59. The number of ways in which 7 persons can address a meeting so that out of the three persons A, B and C, A will speak before B and B before C is

A. 1680

B. 840

C. 120

D. 32

Answer: B

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60. The number of ways in which 10 candidates

$A_1, A_2, A_3, \ldots, A_{10}$ can be ranked so that

A_1 is always above A_{10} is

A. 5!

B. 2(5!)

C. 10!

D. $\dfrac{1}{2}(10!)$

Answer: D

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61. The number of ways in which 11 denoted pencils can be distributed among 6 kids each receiving atleast one is

A. 252

B. 10^5

C. 5^{10}

D. 210

Answer: A

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62. The sides BC, CA, AB of a triangle ABC have

3, 4 and 5 interior points respectively on them.

The number of triangles that can be constructed using these points as vertices is

A. 200

B. 205

C. 400

D. 410

Answer: B

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63. If $^nP_r = 3024$ & $^nC_r = 126$ then the value

of r =

64. Let T_n denote the number of triangles which can be formed by using the vertices of a regular polygon of n sides. If $T_{n+1} - T_n = 28$ Then n =

A. 4

B. 5

C. 6

D. 8

Answer: D

65. The sum of all 4 digit numbers of different

digits formed with the digits 1, 2, 5 and 6 is

A. 93324

B. 90334

C. 93234

D. 90234

Answer: A

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Questions From Competitive Exams

1. The number of ways in which a 7 people can

sit around a round table is

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

B. $^{16}C_5$

C. $^{16}C_9$

D. $^{20}C_8$

Answer: C

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2. There are (n + 1) white and (n + 1) black balls, each set numbered 1 to n + 1. The number of ways in which the balls can be arranged in a

row so that adjacent balls are of different colours, is

A. (2n + 1)

B. 2(2n)!

C. 2[(n + 1)!]

D. $2[(n + 1)!]^2$

Answer: D

3. If $^nP_r = 720 \quad ^nC_r$, then r is equal to

A. 6

B. 5

C. 4

D. 7

Answer: A

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4. Everybody in a room shakes hands with everybody else. The total number of shake hands is 66. The number of persons in the room is

A. 11

B. 12

C. 13

D. 14

Answer: B

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5. The number of four-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

6. The number of circular permutations of n different objects is

A. n!

B. n

C. (n - 2)!

D. (n - 1)!

Answer: D

7. The number of ways in which 5 boys and 3 girls be seated in a row so that each girl is between two boys is

8. If n and r are two positive integers such that $n \geq r$, then $^{n}C_{r-1} + {}^{n}C_{r} =$

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

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

C. $^{n-1}C_r$

D. $^{n+1}C_r$

Answer: D

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9. If $^4C_r = {}^4C_{r+1}$, then the value of r is

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10. The number of straight lines that can be formed by joining 20 points of which 4 points are collinear is

A. 183

B. 186

C. 197

D. 185

Answer: D

11. The number of ways in which a committee of 6 members can be formed from 8 gentlemen and 4 ladies so that the committee contains at least 3 ladies is

12. Evaluate the following:

$$^{20}C_4 =$$

13. Let N be the number of quadratic equations with coefficients from {0, 1, 2, ...,9} such that zero is a solution of each equation. Then the value of N is

    A. infinite

    B. 2^9

    C. 90

    D. 900

Answer: C

14. If $^nC_3 = 220$, then n = ?

15. A polygon has 54 diagonals. Number of sides of this polygon is

A. 12

B. 15

C. 16

D. 9

Answer: A

16. In how many ways can 8 students be arranged in a row?

A. 8!

B. 7!

C. 8

D. 7

Answer: A

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17. The number of different permutations of the word word 'BANANA' is

A. 6

B. 36

C. 30

D. 60

Answer: D
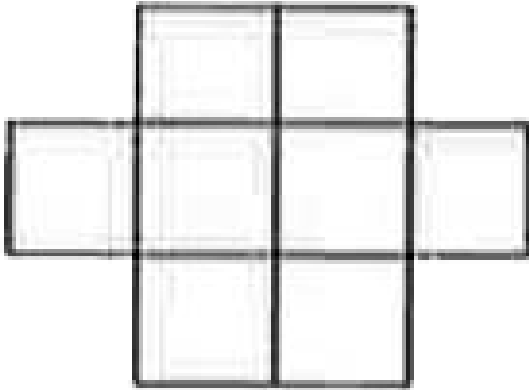
18. Rank of the word " MOTHER " is

A. 261

B. 343

C. 309

D. 273

Answer: C

19. Six X's have to be placed in the squares of the figure below, such that each row contains atleast one X,

this can be done in

A. 24 ways

B. 28 ways

C. 26 ways

D. 36 ways

Answer: C

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20. 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. 140

B. 196

C. 280

D. 346

Answer: B

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21. The value of $\sum_{n=1}^{\infty} \dfrac{{}^nC_0 + \ldots\ldots + {}^nC_n}{{}^nP_n}$

A. e^2

B. e

C. $e^2 - 1$

D. e - 1

Answer: C

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22. Evaluate the following:

$$^{20}C_1 =$$

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23. The number of triangles which can be formed by using the vertices of a regular polygon of (n + 3) sides is 220. Then n =

A. 8

B. 9

C. 10

D. 11

Answer: B

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24. Evaluate the following:

$$^{15}C_2 =$$

25. The number of ways in which 21 objects can be grouped into three groups 8, 7 and 6 object is

A. 455

B. 1575

C. 1120

D. 2030

Answer: D

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26. Evaluate the following:

$$^{105}C_0 =$$

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27. Evaluate the following:

$$^{10}C_3 =$$

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28. The number of permutations of the letters of the word 'CONSEQUENCE' in which all the three Es are together is

A. $9!3!$

B. $\dfrac{9!}{2!}$

C. $\dfrac{9!}{2!2!3!}$

D. $\dfrac{9!}{2!2!}$

Answer: D

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29. If n = 5, then $\left({}^{n}C_0\right)^2 + \left({}^{n}C_1\right)^2 + \left({}^{n}C_2\right)^2 + \ldots\ldots + \left({}^{n}C_5\right)^2$ is equal to

A. 250

B. 254

C. 245

D. 252

Answer: D

30. Let n be a natural number. Then the range

of the function

$$f(n) = {}^{8-n}P_{n-4}, 4 \le n \le 6, \text{ is}$$

A. {1, 2, 3, 4}

B. {1, 2, 3, 4, 5, 6}

C. {1, 2, 3}

D. {1, 2, 3, 4, 5}

Answer: C

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31. The number of ways in which 5 ladies and 7 gentlemen can be seated in a round table so that no two ladies sit together, is

A. $\dfrac{7}{2}(720)^2$

B. $7(360)^2$

C. $7(720)^2$

D. 720

Answer: A

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32. The number of four-letter words that can be formed (the words need not be meaningful) using the letters of the word MEDITERRANEAN

such that the first letter is E and the last letter is R, is

33. All the words that can be formed using alphabets A, H, L, U, R are written as in a dictionary (no alphabet is repeated). Then the rank of the word RAHUL is

A. 70

B. 71

C. 72

D. 74

Answer: D

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34. The value of

$$\left(^7C_0 + {}^7C_1\right) + \left(^7C_1 + {}^7C_2\right) + ... + \left(^7C_6 + {}^7C_7\right)$$

is

A. $2^8 - 1$

B. $2^8 + 1$

C. 2^8

D. $2^8 - 2$

Answer: D

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

A. 4444

B. 5555

C. 6666

D. 7777

Answer: C

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36. Evaluate the following:

$$^{10}C_9 =$$

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37. The number of positive integers less than 40,000 that can be formed by using all the digits 1, 2, 3, 4 and 5 is equal to

A. 24

B. 78

C. 32

D. 72

Answer: D

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38. If $^{56}P_{r+6} : {}^{54}P_{r+3} = 30800 : 1,$ then the value of r is

A. 40

B. 51

C. 101

D. 41

Answer: D

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39. From 12 books, the difference between number of ways a selection of 5 books when one specified book is always excluded and one specified book is always included is

A. 64

B. 118

C. 132

D. 330

Answer: C

40. If $(n+2)!=2550 \times n!$ then the value of n is

....

A. 48

B. 49

C. 50

D. 51

Answer: B

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41. $10C_0 =$

42. The number of integers greater than 6000 that can be formed with 3, 5, 6, 7 and 8, where no digit is repeated, is

A. 120

B. 192

C. 216

D. 72

Answer: B

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43. $10C_1 =$

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44. There are 10 persons including 3 ladies. A committee of 4 persons including atleast one lady is to be formed. The number of ways of forming such a committee is

45. If $^{n}C_3 = 10$, then n is

46. How many numbers with no more than three digits can be formed using only the digits 1 through 7 with no digit used more than once in a given number?

A. 259

B. 249

C. 257

D. 252

Answer: A

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47. If $8!\left[\dfrac{1}{3!} + \dfrac{5}{4!}\right] = {}^{9}P_r$, then the value of r

is equal to

A. 4

B. 5

C. 3

D. 2

Answer: B

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

A. 220

B. 217

C. 215

D. 205

Answer: D

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49. How many four digit numbers abcd exist such that a is odd, b is divisible by 3, c is even and d prime?

A. 380

B. 360

C. 400

D. 520

Answer: C

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50. How many numbers lying between 100 and 1000 can be formed with the digits 0, 1, 2, 3, 4, 5, if the repetition of the digits is not allowed?

A. 125

B. 105

C. 128

D. 625

Answer: C

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

A. 216

B. 375

C. 400

D. 720

Answer: D

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52. 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. 30

B. $5! \times 4!$

C. $7! \times 5!$

D. $6! \times 5!$

Answer: D

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

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

B. $^{n+1}C_r$

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

D. $^{n+2}C_r$

Answer: A

55. How many ways are there to arrange the letters of the word "Garden" with vowels in the alphabetical order.

A. 360

B. 240

C. 120

D. 480

Answer: A

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56. Then 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. $^8C_3$

Answer: B

57. The range of the function $f(x) = {}^{7-x}P_{x-3}$ is

    A. $\{1, 2, 3, 4\}$

    B. $\{1, 2, 3, 4, 5, 6\}$

    C. $\{1, 2, 3\}$

    D. $\{1, 2, 3, 4, 5\}$

Answer: C

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58. 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. 602

B. 603

C. 600

D. 601

Answer: D

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

A. $^{56}C_4$

B. $^{56}C_3$

C. $^{55}C_3$

D. $^{56}C_4$

Answer: A

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60. 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 candidate, 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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61. 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 $^{10}C_5$.

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 A's and 4 B's in a row.

A. Statement - 1 is true, Statement - 2 is

false

B. Statement - 1 is false, Statement - 2 is

true

C. Statement-1 is true, Statement-2 is true,

Statement-2 is a correct explanation for

statement-1

D. Statement-1 is true, Statement-2 is true,

Statement-2 is not a correct explanation

for statement-1

Answer: B

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

A. $7. \ ^6C_4. \ ^8C_4$

B. $8. \ ^6C_4. \ ^7C_4$

C. $6.7. \ ^8C_4$

D. $6.8. \ ^7C_4$

Answer: A

63. The set $S = \{1, 2, 3, \ldots, 12\}$ is to be partitioned into three sets A, B, C of equal size. Thus $A \cup B \cup C = S, A \cap B = B \cap C = \phi$.

The number of ways to partition S is

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

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

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

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

Answer: A

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