



MATHS

BOOKS - OMEGA PUBLICATION

PERMUTATIONS AND COMBINATIONS

Question

1. How many 3-digit numbers can be formed from the digits 1, 2, 3, 4 and 5 assuming that repetition of the digits is not allowed?



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2. How many 3-digit numbers can be formed from the digits 1, 2, 3, 4 and 5 assuming that repetition of the digits is not allowed?



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3. 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?



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4. A coin is tossed 3 times and the outcomes are recorded. How many possible outcomes are there?



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5. Given 5 flags of different colours, how many different signals can be generated if each signal requires the use of 2 flags, one below the other?



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6. Compute $\frac{8!}{6! \times 2!}$



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7. If $\frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$, find x



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8. Evaluate $\frac{n!}{(n-r)!}$, when $n=9, r=5$.



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9. Find the value of n such that

$${}^n P_5 = 42 {}^n P_3, \quad n > 4.$$



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10. Find n if ${}^{n-1}P_3 : {}^n P_4 = 1 : 9$.



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11. Find the number of different 8-letter arrangements that can be made from the letters of the word DAUGHTER so that all vowels occur together.



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12. Find the number of different 8-letter arrangements that can be made from the letters of the word DAUGHTER so that all vowels do not occur together.



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13. How many 3-digit even numbers can be made using the digits 1, 2, 3, 4, 6, 7, if no digit is repeated?



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14. From a committee of 8 persons, in how many ways can we choose a chairman and a vice chairman assuming one person can not hold more than one position?



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15. Find r if ${}^5P_r = 2 {}^6P_{r-1}$.



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



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17. How many words, with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated, if, 4 letters are used at a time?



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18. How many words, with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated, if, all letters are used at a time?



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19. How many words, with or without meaning can be made from the letters of the word MONDAY, assuming that no letter is repeated, if, all letters are used but first letter is a vowel?



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



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21. In how many ways can the letters of the word PERMUTATIONS be arranged if the words start with P and end with S?



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22. In how many ways can the letters of the word PERMUTATIONS be arranged if the vowels are all together?



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23. In how many ways can the letters of the word PERMUTATIONS be arranged if there are always 4 letters between P and S?



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24. Determine n if ${}^{2n}C_3 : {}^nC_3 = 16:1$



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



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26. Find the number of ways of selecting 9 balls from 6 red balls, 5 white balls and 5 blue balls if each selection consists of 3 balls of each colour.



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27. Determine the number of 5 card combinations out of a deck of 52 cards if there is exactly one ace in each combination.



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28. In how many ways can one select a cricket team of eleven from 17 players in which only 5 players can bowl if each cricket team of 11 must include exactly 4 bowlers?



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29. What is the number of ways of choosing 4 cards from a pack of 52 playing cards, if four cards are of the same suit,



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30. What is the number of ways of choosing 4 cards from a pack of 52 playing cards, if four cards belong to four different suits,



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31. What is the number of ways of choosing 4 cards from a pack of 52 playing cards, if they are face cards.



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Important Questions From Miscellaneous Exercise

1. How many words, with or without meaning, each of 2 vowels and 3 consonants can be formed from the letters of the word DAUGHTER ?



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2. If the different permutations of all the letter of the word EXAMINATION are listed as in a dictionary, how many words are there in this list before the first word starting with E ?



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3. In an examination, a question paper consists of 12 questions divided into two parts i.e., Part I and Part II, containing 5 and 7 questions, respectively. A student is required to attempt

8 questions in all, selecting at least 3 from each part. In how many ways can a student select the questions ?



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4. From a class of 25 students, 10 are to be chosen for an excursion party. There are 3 students who decide that either all of them will join or none of them will join. In how many ways can the excursion party be chosen ?



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5. In how many ways can the letters of the word ASSASSINATION be arranged so that all the S's are together ?



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6. 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 ?



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7. 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 ?



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8. If all permutations of the letters of the word "AGAIN" are arranged as in a dictionary, then 50th word is



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Multiple Choice Questions Mcqs

1. In a group of boys two boys are brothers and in this group 6 more boys are there. In how many ways can they sit if the brothers are not to sit along with each other?

A. $2 \times 6!$

B. ${}^7P_2 \times 6!$

C. ${}^7C_2 \times 6!$

D. none of these

Answer: B



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2. Seven women and seven men are to sit around 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. $7I$

Answer: C



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3. In how many ways can 5 different beads be arranged to form a necklace?

A. 12

B. 120

C. 60

D. 24

Answer: A



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4. The value of ${}^{15}C_{11} + {}^{15}C_{10}$ is equal to

A. $\frac{15}{11}$

B. $\frac{15}{10}$

C. $\frac{5}{11}$

D. $\frac{5}{10}$

Answer: C



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5. If ${}^{43}C_{r-6} = {}^{43}C_{3r+1}$ then the value of r is

A. 12

B. 8

C. 6

D. 10

Answer: A



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6. ${}^n C_r + 2^n C_{r+1} + {}^n C_{r+2}$ is equal to
($2 \leq r \leq n$)

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

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

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

D. none of these

Answer: C



7. Every body in a room shakes hand with every body else. The total number of hand-shakes is 66. The number of persons in the room is

A. 11

B. 12

C. 13

D. 14

Answer: B



8. 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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9. There are n points in a plane of which p points are collinear. How many lines can be formed from these points ?

A. 183

B. 185

C. 197

D. 190

Answer: B



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10. The number of diagonals that can be drawn by joining the vertices of an octagon is

A. 28

B. 48

C. 20

D. none of these

Answer: C



11. A polygon has 44 diagonals. The number of its sides is

A. 10

B. 11

C. 12

D. 13

Answer: B



12. The value of 8P_7 is

A. 7!

B. 8!

C. 8

D. 15

Answer: B



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13. $P(n, 6) = 3 P(n, 5)$, then n is equal to

A. 6

B. 7

C. 8

D. 10

Answer: C



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14. If $2^n P_3 = {}^{n+1}P_3$, then n is equal to

A. 4

B. 5

C. 6

D. 7

Answer: B



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15. The value of ${}^n P_r$, and ${}^n C_r$ will be equal when

A. $n=r$

B. $r=\frac{n}{2}$

C. $r=1$

D. $r=0$ or !

Answer: D



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16. $\frac{C(9, 7)}{C(9, 5)} = ?$

A. $2/7$

B. $7/5$

C. 7

D. $7/2$

Answer: A



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17. The numbers of diagonals in an n sided figure is equal to

A. ${}^n C_2$

B. ${}^n C_2 - 2$

C. ${}^n C_2 - n$

D. ${}^n C_2 - 1$

Answer: C



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18. If ${}^{35} C_{n+7} = {}^{35} C_{4n-2}$ then all the values of n are given by

A. 28

B. 3,6

C. 3

D. 6

Answer: D



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19. Ashok, Usha, Rani, Sonu are to give speeches in a class. The teacher can arrange the order of their presentation in

A. 4 ways

B. 12 ways

C. 256 ways

D. 24 ways

Answer: D



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20. How many words can be formed from the letters of the word 'COMMITTEE'?

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

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

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

D. $9!$

Answer: C



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21. in how many ways can 5 red and 4 white balls be draw from a bag containing 10 red

and 8 white balls?

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

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

C. ${}^{18}C_9$

D. none of these

Answer: B



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