Name of the Bundle	Advanced Bundle V1	Subject	Aptitude
Topic	Permutation and Combination	Last updated on	02 September 2025

CONCEPT 1 – COINS RELATED PROBLEMS

1) Find the value of $^{7}P_{4}$
a) 420.
b) 840.
c) 750.
d) 860.

ANS: b) 840.

Explanation:

$^{n}P_{r} = n!/(n-r)!$

$^{7}P_{4} = (7*6*5*4*3!) / 3! = 42*20 = \textbf{840.}$

2) Find the value of $^{10}P_{3}$
a) 900.
b) 800.
c) 620.
d) 720.

ANS: d) 720.

Explanation:

$^{n}P_{r} = n!/(n-r)!$

$^{10}P_{3} = (10*9*8*7!) / 7! = 10*9*8 = \textbf{720.}$

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3) Find the value of $^{50}P_2$
a) 4500
b) 3260
c) 2450
d) 1470

ANS: c) 2450.

Explanation:

$^nP_r = n!/(n-r)!$

$^{50}P_2 = (50*49*48!) / 48! = 50*49 = \mathbf{2450}.$

4) Find the value of $^7C_4$
a) 70

b) 35

c) 80

d) 85

ANS: b) 35.

Explanation:

- $^nC_r = (n!) / (n-r!)(r!)$
- $^7C_4 = (7*6*5*4!)/(3!)(4!) = \mathbf{35}$.

5) Find the value of $^{7}C_{7}$
a) 3.
b) 2.
c) 0.
d) 1.

ANS: d) 1.

Explanation:

- $^{n}C_{r} = (n!) / (n-r!)(r!)$
- $^{7}C_{7} = (7!)/(0!)(7!) = $ **1.**

6) Find the value of $^{7}C_{0}$
a) 2.
b) 0.
c) 1.
d) 3.

ANS: c) 1.

Explanation:

- $^{n}C_{r} = (n!) / (n-r!)(r!)$
- $^{7}C_{0} = (7!)/(7!)(0!) = $ **1.**

7) In how many ways, can we select a team of 4 students from a given choice of 15?
a) 1460.
b) 1365.
c) 1120.
d) 1325.

ANS: b) 1365.

Explanation:

- We know that $^nC_r = (n!) / (n-r!)(r!)$
- $^{15}C_4 = (15*14*13*12*11!)/(11!)(4!) = 105 * 13 = \mathbf{1365.}$

8) Find the number of distinguishable ways the letters of the word 'RUBBER' can be arranged?
a) 450.
b) 362.
c) 250.
d) 180.

ANS:d) 180.

Explanation:

- This word has six letters, of which there are 2 R's, 2 B's, 1 E's and 1U's.
- Thus, the number of distinguishable ways the letters can be written is,

$$(6!) / (2! \, 2! \, 1!) = (6*5*4*3*2*1) / 2*2 = \mathbf{180.}$$

9) How many words can be formed by using letters of the word 'DELHI'?
a) 50.
b) 72.
c) 85.
d) 120.

ANS: d) 120.

Explanation:

- This word has five letters, every letter is unique.
- Thus, the number of distinguishable ways the letters can be written is,

$$(5!) / (1!\ 1!\ 1!\ 1!\ 1!) = \textbf{120.}$$

10) How many words can be formed by using 3 letters from the word "DELHI"?
a) 20.
b) 60.
c) 30.
d) 10.

ANS: b) 60.

Explanation:

- The number of words that can be formed by using 3 letters from the word "DELHI" is,

$$^{5}P_{3} = (5*4*3*2!)\ /\ 2!$$

$$^{5}P_{3} = \textbf{60.}$$

11) In how many distinguishable ways can the letters of the word 'LEADER' be arranged?
a) 72.
b) 360.
c) 144.
d) 720.

ANS: b) 360.

Explanation:

- This word has six letters, of which there are 2 E's, 1 L's, 1 A's, 1 D's and 1 R's.
- Thus, the number of distinguishable ways the letters can be written is,

$$(6!) / (2!\ 1!\ 1!\ 1!\ 1!) = (6*5*4*3*2!) / 2! = \textbf{360}.$$

12) In what ways can a group of 6 boys and 2 girls be made out of the total of 7 boys and 3 girls?
a) 50.
b) 120.
c) 21.
d) 20.

ANS: c) 21.

Explanation:

- We know that $^nC_r = (n!) / (n-r!)(r!)$
- The combination of 6 boys out of 7 and 2 girls out of 3 can be represented as $^7C_6 * {}^3C_2$
- Therefore, the required number of ways $= {}^7C_6 * {}^3C_2$

$$= (7*6!)/(1!)(6!) * (3*2!)/(1!)(2!) = 7*3 = 21.$$

- Hence, in **21 ways** the group of 6 boys and 2 girls can be made.

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Name of the Bundle	Advanced Bundle V1	**Subject**	Aptitude
Topic	Permutation and Combination	**Last updated on**	02 September 2025

13) In how many ways can a committee, consisting of 5 men and 6 women, be formed from 8 men and 10 women?
a) 266.
b) 5040.
c) 11760.
d) 86400.

ANS: c) 11760.

Explanation:

- We know that $^nC_r = (n!) / (n-r!)(r!)$
- The combination of 5 men out of 8 and 6 women out of 10 can be represented as $^8C_5 * {}^{10}C_6$
- Therefore, the required number of ways $= {}^8C_5 * {}^{10}C_6$

  $= (8*7*6*5!)/(3!)(5!) * (10*9*8*7*6!)/(4!)(6!) = 56*210 = 11760.$

- Hence, in **11760 ways** the committee of 5 men and 6 women can be made.

14) Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?

a) 210.
b) 1050.
c) 25200.
d) 21400.

ANS: c) 25200.

Explanation:

- The combination of 3 consonants out of 7 and 2 vowels out of 4 can be represented as $^7C_3 * {}^4C_2$
- Therefore, the required number of ways $= {}^7C_3 * {}^4C_2$

$$= (7*6*5*4!)/(3!)(4!) * (4*3*2!)/(2!)(2!) = 35*6 = 210.$$

- Number of groups, each having 3 consonants and 2 vowels = 210.
- Each group contains 5 letters.
- Number of ways of arranging 5 letters among themselves = 5!

$$= 5×4×3×2×1 = 120.$$

- $\therefore$ Required number of words = (210×120) = **25200.**

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15) From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?

a) 564.
b) 645.
c) 735.
d) 756.

ANS: d) 756.

Explanation:

- We know that $^nC_r = (n!) / (n-r!)(r!)$
- Ways in which at least 3 men are selected,
  1. 3 Men + 2 Women
  2. 4 Men + 1 Women
  3. 5 Men + 0 Women
- Number of ways $= {}^7C_3 * {}^6C_2 + {}^7C_4 * {}^6C_1 + {}^7C_5 * {}^6C_0$

$$= 35*15 + 35 * 6 + 21 = 756.$$

- Hence, in **756 ways** the committee of at least 3 men can be made.

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16) In a group of 6 boys and 4 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy should be there?
a) 209.
b) 159.
c) 194.
d) 205.

ANS: a) 209.

Explanation:

- Ways in which at least 1 boy is selected,
    1. 1 Boy + 3 Girls
    2. 2 Boys + 2 Girls
    3. 3 Boys + 1 Girl
    4. 4 Boys + 0 Girl
- Number of ways = $^6C_1 * {}^4C_3 + {}^6C_2 * {}^4C_2 + {}^6C_3 * {}^4C_1 + {}^6C_4 * {}^4C_0$

    = 6*4 + 15 * 6 + 20*4 + 15*1 = 24+90+80+15 = **209.**

- Hence, in **209 ways** the group of at least 1 boy can be made.

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17) In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?
a) 360.
b) 480.
c) 720.
d) 5040.

ANS: c) 720.

Explanation:

- As vowels come together (i.e., AEI) in a group.
- Therefore, Number of letters = 4 + 1(vowel group) = 5.
- The vowels can change their place,
- Number of ways = 5! * 3! = (5*4*3*2*1) * (3*2*1) = **720.**

18) In how many different ways can the letters of the word 'OPTICAL' be arranged so that the vowels always come together?
a) 720.
b) 120.
c) 4320.
d) 2160.

ANS: a) 720.

Explanation:

- As vowels come together (i.e., AIO) in a group.
- Therefore, Number of letters = 4 + 1(vowel group) = 5.
- The vowels can change their place,
- Number of ways = 5! * 3! = (5*4*3*2*1) * (3*2*1) = **720.**

19) How many 4-letter words with or without meaning, can be formed out of the letters of the word, 'LOGARITHMS', if repetition of letters is not allowed?

a) 4000.

b) 400.

c) 2520.

d) 5040.

ANS: d) 5040.

Explanation:

As the repetition is not allowed, $^nP_r = n!/(n-r)!$

$^{10}P_4 = (10*9*8*7*6!) / (6!) = $ **5040.**

20) In how many different ways can the letters of the word 'DETAIL' be arranged in such a way that the vowels occupy only the odd positions?

a) 32.

b) 48.

c) 36.

d) 60.

ANS: c) 36.

Explanation:

- There are 6 letters in the given word, out of which there are 3 vowels and 3 consonants.
- Let us mark these positions as: (1) (2) (3) (4) (5) (6)
- Now, 3 vowels can be placed at any of the three places, marked 1, 3, 5.
- Number of ways of arranging the vowels = $^3P_3 = 3! = 6$.
- Also, the 3 consonants can be arranged at the remaining 3 positions.
- Number of ways of these arrangements = $^3P_3 = 3! = 6$.
- Total number of ways = (6 x 6) = 36.

21) How many possible two-digit numbers can be formed by using the digits 3,5 and 7 (repetition allowed)?
a) 10
b) 9
c) 7
d) 8

Ans: B) 9

Explanation:

Each place (tens and units) has 3 choices.
Total = 3×3 = 9.

22) How many 5-digit numbers can be formed using the digits 1,2,2,4,2,4?
a) 120
b) 720
c) 60
d) 360

Ans: C) 60

Explanation:

Digits: 1,2,2,4,2,4 (total 6 digits, with three 2's and two 4's)
Select all 5 digits: arrangements = 6!/ (3!*2!) = 720/12 = 60.

23) How many eight-letter words can be formed from the letters of the word "COURTESY" beginning with C and ending with Y?
a) 120
b) 720
c) 256
d) 750

Ans: B) 720

Explanation:

Fix C at start and Y at end.
Remaining: 6 letters.
Arrangements = 6! = 720.

24) Find the number of permutations of the letters of the word 'PRAYAGRAJ'.
a) 60480
b) 30240
c) 15120
d) None of the above

Ans: B) 30240

Explanation:

Letters: P,R,A,Y,A,G,R,A,J (9 letters, 3 A's, 2 R's)

Arrangements = 9! / (3!*2!) = 362880 / 12 = 30240

25) How many ways can the letters of the word 'MANAGER' be rearranged, so that the letters G,E,R will always come together?
a) 360
b) 120
c) 240
d) 480

Ans: A) 360

Explanation:

Treat GER as one unit. Remaining letters: M,A,N,A.
So total units = 5.
Arrangements = 5! / 2! (since A repeats) * 3! (for GER) = 60*6 = 360.

26) Five people take part in a tournament. Each one has to play with every other one. How many minimum number of games must they play?
a) 10
b) 12
c) 8
d) 18

Ans: A) 10

Explanation:

Each pair plays once.
Number of pairs = $^5C_2$ = 10.

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27) How many different words, with or without meaning, can be formed by using the letters of the word COVID?
a) 60
b) 150
c) 100
d) 120

Ans: D) 120

Explanation:

The word COVID has 5 unique letters.
Number of arrangements = 5! = 120.

28) A panel of 5 members is selected from 8 males and 5 females. How many ways if at most 2 females?
a) 966
b) 900
c) 920
d) 850

Ans: A) 966

Explanation:

We can have 0, 1, or 2 females.
Cases:
0F + 5M = $^5C_5$ * $^8C_5$ = 1*56 = 56
1F + 4M = $^5C_1$ * $^8C_4$ = 5*70 = 350
2F + 3M = $^5C_2$ * $^8C_3$ = 10*56 = 560
Total = 56 + 350 + 560 = 966.