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Permutation and Combination Questions for IBPS PO Pre. and SBI PO Pre. Exams

Permutation and Combination Quiz 5

Direction: Read the following questions carefully and choose the right answer.

- In how many ways the letters of the word "MEMORABLE" can be arranged so that no two vowels are together?

A. 21600 B. 18400 C. 11400 D. 9200 E. 10800
- There are 22 pink colour coupons and 21 red colour coupons that are to be distributed among 20 girls and 18 boys respectively of a class. Each coupon has a unique number written on it. Find the number of ways the coupons can be distributed.

A. $77 \times 19! \times 21!$ B. $770 \times 20! \times 21!$ C. $770 \times 19! \times 20!$
D. $770 \times 19! \times 21!$ E. $770 \times 18! \times 20!$
- On a carrom board there are 6 brown, 5 black and 1 red queen pieces present. In how many ways Aman, who is playing alone, can take all the pieces if the queen has to be followed by a black piece.

A. 4620 B. 3360 C. 2310 D. 2840 E. None of these
- In how many ways 8 different chocolates can be distributed among 10 children if a child can be given any number of chocolate?

A. 10^8 B. 8^{10} C. $8!$ D. $7! \times 2$ E. $8! \times 2$
- How many words can be formed with the help of the letters of the word "aberration" such as all the words start with 'n' and end with 'e'?

A. 10092 B. 10080 C. 10106 D. 10025 E. None of these

6. The number of ways to arrange five persons on five chairs arranged in a line is K and the number of ways to arrange them on five chairs around a round table is P. What is the value of $K + P$?
- A. 100 B. 124 C. 144 D. 110 E. 120
7. Ankit doesn't want all the consonants to be together; in how many ways he can arrange letters of the word 'Constitute'?
- A. 590350 B. 590450 C. 590300 D. 590400 E. 590500
8. In how many different ways can the letters of the word "ACKNOWLEDGE" be arranged in such a way that the vowels occupy only the even position?
- A. 21600 B. 43200 C. 72000 D. 36500 E. 26500
9. In how many ways letters of the word "HIMALAYAN" can be rearranged such that similar letters are together and there is a vowel on at least one end of the word?
- A. 2750 B. 2460 C. 2880 D. 3250 E. 2640
10. A group of 4 students which should include at most one girl is to be selected from 5 boys and 4 girls. In how many ways the group can be selected?
- A. 45 B. 52 C. 40 D. 32 E. 48



Correct Answers:

1	2	3	4	5	6	7	8	9	10
E	D	C	A	B	C	D	B	E	A

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Explanation:

1. MEMORABLE

Vowel are E,E,O,A and Consonants are M,M,R,B,L

First we arrange consonants by $\frac{5!}{2} = 60$ ways

__ M __ M __ R __ L __ B __

There are 6 spaces, out of which we select four and then arrange four vowels in them

$$\text{Ways} = {}^6C_4 \times \frac{4!}{2!} = 180$$

Total arrangements = $60 \times 180 = 10800$

Hence, option E is correct

2. Number of ways for girls = ${}^{22}P_{20} = 11 \times 21!$

Number of ways for boys = ${}^{21}P_{18} = 70 \times 19!$

Total number of ways = $11 \times 21! \times 70 \times 19! = 770 \times 19! \times 21!$

Hence, option D is correct.

3. Let us denote R – Red (1), B – Black (5) and N – Brown (6)

Let us assume (RB) or Red followed by Black as one single piece

Now we have 6 N and 4 B and one (RB) piece

Total pieces = $6 + 4 + 1 = 11$

$$\text{Ways to arrange them} = \frac{11!}{6! \times 4!} = 2310$$

Hence, option C is correct.

4. To distribute 1st chocolate there are ten options as there are 10 children and it can be given to any child.

Similarly to distribute 2st chocolate there are ten options.

And so on.

$$\text{Number of ways} = 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$$

$$\text{Total number of ways} = 10^8$$

Hence, option A is correct.

5. There are 10 alphabets in the word "aberration", two places are fixed with 'n' on first place and 'e' on last place. Rest 8 places are filled with 8 alphabets in 8! Ways.

$$\text{Words that can be formed} = \frac{8!}{2!2!} = 10080$$

Hence, option B is correct.

6. Linear arrangement, $K = 5!$

$$\text{Circular arrangement, } P = (5 - 1)! = 4!$$

$$\text{Total number of ways, } K + P = 5! + 4! = 144$$

Hence, option C is correct.

7. Number of ways in which consonants are not together = total ways to arrange the word – number of ways in which consonants are together.

In the word, there are 10 letters, out of which 6 are consonants (C, N, S, T, T, T) where T is repeated 3 times and 4 vowels (O, I, U, E)

$$\text{Total ways} = \frac{10!}{3!}$$

$$= 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 = 604800$$

6 consonants are considered as a group, the consonants are arranged in $\frac{6!}{3!}$ Ways,

Number of ways in which consonants are together

$$= 5! \times \frac{6!}{3!} = 5 \times 4 \times 3 \times 2 \times 1 \times \frac{6 \times 5 \times 4 \times 3 \times 2 \times 1}{3 \times 2 \times 1} = 14400$$

Number of ways in which consonants are not together = $604800 - 14400 = 590400$

Hence, option D is correct.



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8. There are 11 places, 5 even places and 4 vowels.

$$\text{Number of ways} = {}^5P_4 \times \frac{6!}{2!} = 43200$$

Hence, option B is correct.

9. Letters \rightarrow Consonants - HMLYN and Vowels - IAAA

We will consider (AAA) as one element

So, there will be a total of "HMLYN (AAA)I" = 7 elements

Ways to rearrange such that similar letters are together = $7!$

Ways to rearrange such that similar letters are together and the word neither starts or ends with a vowel,

First, we take two consonants (out of 5) and arrange them on both the ends = ${}^5C_2 \times 2!$
= 20 ways and then arrange the rest of 5 elements in between them by 5! Ways

Total ways = $20 \times 5!$

Combinations in which similar letters are together and there is a vowel on at least one end = $7! - 20 \times 5! = 2640$

Hence, option E is correct.

10. We can either select 0 girl and 4 boys or girl and 3 boys

Ways = ${}^5C_3 \times {}^4C_1 + {}^5C_4 = 45$

Hence, option A is correct.



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