THINK ACADEMY
MATH CLASSES By O.P. GUPTA
Class XI - Mathematics (041)
Topics - Permutations & Combinations

VISHWAS TEST SERIES - 6
(For Academic session 2024-25)

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Max. Marks - 30
Time - 60 Minutes

Followings are of 2 Marks each (Q01-05).

Q01. How many 3-digits even nos. can be generated using the digits 2, 3, 4, 5, 6 if repetition is not allowed?

Q02. How many different signals can be generated by using five flags of different colors if a signal requires the use of at least two flags?

Q03. A committee of 3 students is to be constituted from a group of 3 boys and 2 girls. In how many ways can this be done? How many of these committees would consist of one girl and 2 boys?

Q04. How many words having four letters, with or without meaning, can be generated by using the letters of the word 'PLATINUM'?

Q05. Find the value of n, if ${}^{n-1}P_3 : {}^{n-1}P_4 = 1:9$. [2×5 = 10

Followings are of 3 Marks each (Q06-07).

Q06. Find the number of ways, in which 8 Indians, 6 Americans and 4 Englishmen can be seated in a row so that all the persons of the same nationality sit together.

Q07. How many numbers greater than 10, 00, 000 can be formed by using the digits 1, 2, 0, 2, 4, 2, 4?

OR

If the letters of the word PRANAY are arranged as in dictionary in all possible ways, then what will be the 182^{nd} word? [3×2 = 6

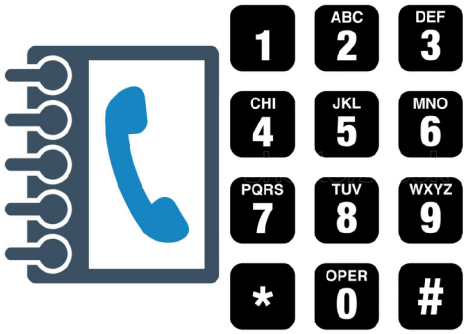
Following is of 4 Marks (Q08).

Q08. **CASE STUDY :** In a metro city, the telephone numbers have seven digits. Telecom Department has allotted a specific set of two digits (both must not be 0), which is to be used as the first two digits of all the telephone numbers.

Based on the information given above, answer the following questions.

(a) If first two digits of the telephone numbers are 25, then how many different telephone numbers can be generated? Assume that the digits in the telephone numbers can be repeated.

(b) If first two digits of the telephone numbers are 25, then how many different telephone numbers can be generated? Assume that the digits in the telephone numbers can not be repeated.



[2×2 = 4

Followings are of 5 Marks each (Q09-10).

Q09. Prove that : ${}^{n}C_r + {}^{n}C_{r-1} = {}^{n+1}C_r$.

OR

Prove that : ${}^{2n}C_n = \left[\frac{1.3.5.7.....(2n-1)}{n!}\right] \times 2^n$.

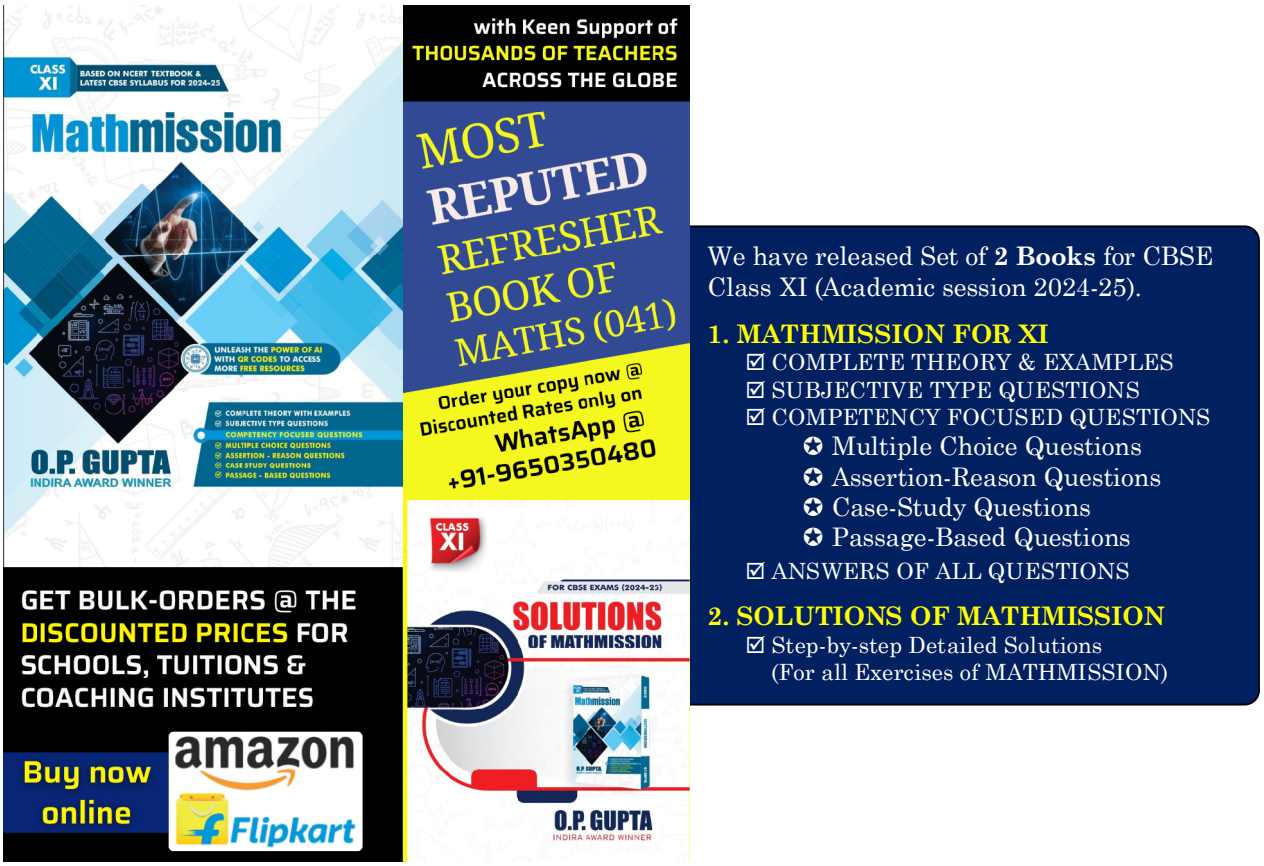
Q10. Find the number of arrangements of the letters of the word YOUTUBER.

In how many of these arrangements

(a) do the words start with R?

(b) do the vowels never occur together?

(c) there are always three letters between Y and T? [5×2=10



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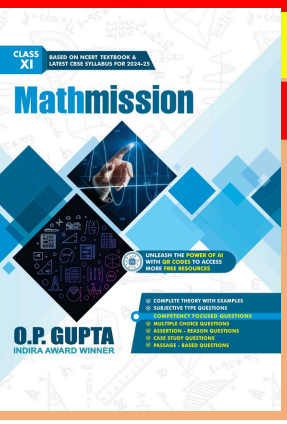

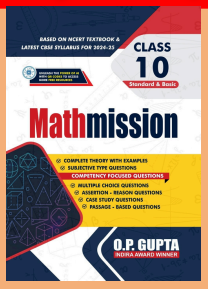

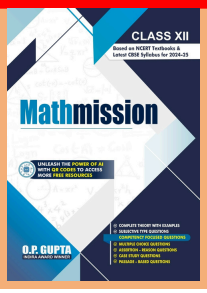

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