SHIKSHA CLASSES

Subject : Maths - II | **Question Paper** | **Total Marks :25**

Class : XI | **3 : Permutations and Combinations** | **Time : 1 Hour**

SECTION - A

Q.1 : Choose the correct option : 4

i) There are 10 persons among whom two are brothers. The total number of ways in which

these persons can be seated around a round table so that exactly one person sits between

the brothers, is equal to:

a) 2!×7! b) 2!×8! c) 3!×7! d) 3!×8!

ii) Find the number of triangles which can be formed by joining the angular points of a polygon of 8 sides as vertices.

a) 16 b) 56 c) 24 d) 8

Q.2 : Solve the following questions: 2

i) Find n, if ${}^{n}C_{8} = {}^{n}C_{6}$

ii) In how many different arrangements can 6 gentlemen and 6 ladies sit around a table if

there is no restriction.

SECTION B

Solve the following : (ANY 3) 6

Q.3 : How many four digit numbers will not exceed 7432 if they are formed using the digits 2, 3, 4, 7 without repetition?

Q.4 : Find n, if :

$$\frac{(2n)!}{7!(2n-7)!} : \frac{n!}{4!(n-4)!} = 24 : 1$$

Q.5 : Simplify : $\frac{n^2-9}{(n+3)!} + \frac{6}{(n+2)!} - \frac{1}{(n+1)!}$

Q.6 : How many 4 letter words can be formed using letters in the word MADHURI, if

i) letters can be repeated

ii) letters cannot be repeated

Q.7 : Find n if : ${}^{2n}C_{3} : {}^{n}C_{2} = 52 : 3$

SECTION C

Solve the following : (ANY 3) 9

Q.8 : How many numbers between 100 and 1000 have the digit 7 exactly once?

Q.9 : Find m and n, if ${}^{(m+n)}P_{2} = 56$ and ${}^{(m-n)}P_{2} = 12$

Q.10 : Find n and r if, ${}^{n}C_{r-1} : {}^{n}C_{r} : {}^{n}C_{r+1} = 20 : 35 : 42$

Q.11 : Find the difference between the greatest values in the following.

i) ${}^{14}Cr$ and ${}^{12}Cr$

ii) ${}^{13}Cr$ and ${}^{8}Cr$

iii) ${}^{15}Cr$ and ${}^{11}Cr$

Q.12 : If ${}^{n}P_{r} = 1814400$ and ${}^{n}C_{r} = 45$, find ${}^{n+4}C_{r+3}$.

SECTION D

Answer the following : (ANY 1) 4

Q.13 : If ${}^{n}C_{r-1} = 6435$, ${}^{n}C_{r} = 5005$; ${}^{n}C_{r+1} = 3003$, find ${}^{r}C_{r+3}$.

Q.14 : Find the numbers of different ways of arranging letters in the word PLATOON if;

i) The two O's are never together.

ii) Consonants and vowels occupy alternate positions.

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