Maxprap. Chapter wise Series Class 11th – Permutation and Combination

Class : 11th **Subject: Mathematics**

Max. Marks : 60 **Duration : 2 Hrs**

Sections: A (MCQs), B (Short Answer-I), C (Short Answer-II), D (Long Answer), E (Case-Based).

General Instructions:

(i). All questions are compulsory.

(ii). This question paper contains 25 questions divided into five Sections A, B, C, D and E. (iii). Section A comprises of 10 MCQs of 1 mark each. Section B comprises of 5 questions of 2 marks each. Section C comprises of 4 questions of 3 marks each. Section D comprises of 4 question of 5 marks each and Section E comprises of 2 Case Study Based Questions of 4 marks each.

(iv). There is no overall choice.

(v). Use of Calculators is not permitted.

Section A

Questions 1 to 10 carry 1 mark each

1. How many different teams of 7 players can be chosen out of 10 players?

a) 720 b) 90 c) 120 d) 70

2. If ${}^{n}\mathrm{p}_{5} = 20.\ {}^{n}\mathrm{p}_{3}$, then n = ?

a) 8 b) 9 c) 11 d) 10

3. In how many ways can 5 children stand in a queue?

a) 25 b) 120 c) 5 d) 60

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

a) 32 b) 56 c) 48 d) 64

5. In how many ways can 10 books be arranged on a shelf so that a particular pair of books shall be never together?

a) 9 ! b) 8 ! c) 8 × 9! d) 2 × 9!

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

a) 8 b) 10 c) 6 d) 12

7. If ${}^{n}\mathrm{C}_{18} = {}^{n}\mathrm{C}_{12}$, then ${}^{32}\mathrm{C}_{n}$ = ?

a) 248 b) 496 c) 938 d) 992

8. In how many ways can a committee of 5 members be selected from 6 men and 5 ladies, consisting of 3 men and 2 ladies?

a) 25 b) 50 c) 200 d) 100

Assertion(A)/Reason(R) Based (9-10): In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

9. Assertion (A): $(\sum_{r=0}^{100} {}^{500-r}C_3) + {}^{400}\text{C}_4 = {}^{501}\text{C}_4$

Reason (R): ${}^{n}\text{C}_r + {}^{n}\text{C}_{r-1} = {}^{n+1}\text{C}_r$

10. Assertion (A): The Total no. words with letters of the word civilization (all taken at a time) is 19958393.

Reason (R): The number of permutation of n distinct objects (r taken at a time) is ${}^{n}\text{p}_r$.

SECTION – B

Questions 11 to 15 carry 2 marks each

11. Evaluate ${}^{20}C_5 + \sum_{r=2}^{5} {}^{25-r}C_4$.

12. If ${}^{18}\text{C}_r = {}^{18}\text{C}_{r+2}$, find ${}^{r}\text{C}_5$.

13. How many 9 - digit numbers of different digits can be formed?

14. Let r and n be positive integers such that$1 \leq r \leq n$. Then prove $\frac{{}^{n}C_r}{{}^{n}C_{r-1}} = \frac{n-r+1}{r}$.

15. How many numbers are there between 100 and 1000 in which all the digits are distinct?

SECTION – C

Questions 16 to 19 carry 3 marks each

16. 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?

17. How many three digit numbers can be formed by using the digits 0, 1, 3, 5, 7 while each digit may be repeated any number of times?

18. Determine n if ${}^{2n}C_3 : {}^{n}C_3 = 11:1$.

19. Find the number of combinations and permutations of 4 letters taken from the word **EXAMINATION**.

SECTION – D

Questions 20 to 23 carry 5 marks each

20. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these

a) four cards are of the same suit?
b) four cards belong to four different suits?
c) are face cards?
d) cards are of the same colour?

21. If ${}^{n}C_{r-1} = 36$, ${}^{n}C_{r} = 84$ and ${}^{n}C_{r+1} = 126$, then find ${}^{r}C_{2}$. [Hint: Form equation using $\frac{{}^{n}C_{r}}{{}^{n}C_{r+1}}$ and $\frac{{}^{n}C_{r}}{{}^{n}C_{r-1}}$ to find the value of r.]

22. How many different words can be formed with the letters of the word 'HARYANA? How many of these

a) have H and N together?
b) begin with H and end with N?
c) have three vowels together?

23. A group consist of 4 girls and 7 boys. In how many ways, a team of 5 members be selected, if the team has

a) no girl?
b) at least one boy and one girl?
c) at least 3 girls?

SECTION – E (Case Study Based Questions)

Questions 24 & 25 carry 4 marks each

24. A permutation is **an act of arranging the objects or numbers in order** . Combinations are the way of selecting the objects or numbers from a group of objects or collections, in such a way that the order of the objects does not matter.

PERMUTATIONS

In, how many ways can the letters of the word PERMUTATIONS be arranged if the
(i) words start with P and end with S
(ii) vowels are all together

25. A permutation is **an act of arranging the objects or numbers in order** . Combinations are the way of selecting the objects or numbers from a group of objects or collections, in such a way that the order of the objects does not matter.

How many different words can be formed by using all the letters of the word ALLAHABAD?

ALLAHABAD

a) In how many of them, vowels occupy the even position?
b) In how many of them, both L do not come together?

Permutation and Combination Paper Details – Analysis		
Objective Questions		
MCQ	1 marks x 8 question = 8	
Assertion Reason	1 marks x 2 question = 2	
Subjective		
Short type I	2 marks x 5 question = 10	
Short type II	3 marks x 4 question = 12	
Long Type	5 marks x 4 question = 20	
Case Studies Based		
Case 1	4 marks	
Case 2	4 marks	

Total = 60 marks Your Score =