

PERMUTATION AND COMBINATION

2

| Marks | 1 | 2 | 3 | Total Marks |
|-----------------|------|------|------|-------------|
| No.of Questions | 1(U) | 1(U) | 1(U) | 6 |

1 MARK QUESTIONS

(Understanding)

1. Find n if $nP_3 = 210$.
2. If $nP_3 : nP_2 = 3 : 1$ find ' n '
3. In how many ways Can 7 people stand in a queue.
4. If $5P_r = 60$, find the value of r .
5. In how many ways Can 5 letters be posted in 5 letter boxes if each box has one letter.
6. How many different arrangements can be made with the letters of the word 'SUNDAY'?
7. In how many ways can 4 people occupy 6 vacant chairs?
8. How many different arrangements can be made with the letters of the word 'COOL'?
9. In how many ways can 9 people be seated around a table.
10. In how many ways can 7 flowers of different colours be string together to form a garland.
11. Find the total number of ways in which 8 different coloured beads can be string together to form a necklace.
12. If $nC_4 = nC_5$, find the value of n .
13. In how many ways a committee of 5 Can be chosen from 10 students.
14. How many straight lines can be formed from 10 points if no three of them are collinear.
15. How many triangles can be formed from non-collinear points.

2 MARKS QUESTIONS

(Understanding)

1. In how many ways can 7 people be seated in a row for a photograph if two particular people always want to be together.
2. In how many ways can 6 maths books, 7 physics books and 3 chemistry books be arranged in a shelf if the maths books are always together.
3. In how many ways can 9 boys and 6 girls be arranged in row if no two girls are together.
4. How many words can be formed from the letters of the word "TREND" which begin with T and end with D.
5. In how many ways can 7 persons be seated in a row if two persons always occupy the end seats.

BASIC MATHEMATICS

6. In how many ways can 3 boys and 4 girls be arranged in a row so that all the three boys are together.
7. In how many ways the word "MATTER" be arranged such that the 2 T's are always together.
8. How many 4 digit numbers can be formed with the digits 0,2,3,5,7 Such that no digits are repeated.
9. How many 3 digit numbers ending with 7 can be formed using the digits 1,2,5,7,8 digits cannot be repeated.
10. How many 6 digit numbers can be formed from the digits 1,2,3,4,5,6 (no digit being repeated) which are divisible by 5.
11. Find the number of ways in which 8 men be arranged around a table so that 2 particular men may not be next to each other.
12. In how many ways can 6 gentlemen and 4 ladies be seated around a table so that no two ladies are together.
13. In how many ways can 10 beads of different colours be string into a necklace if the red, green and yellow beads are always together.
14. In how many ways can 5 boys and 6 girls be arranged in a circle so that no two boys are together.
15. In how many ways can 5 gentlemen and 5 ladies be arranged in a circle if no two ladies are together.
16. Find the number of ways in which 10 flowers can be string into a garland if 3 particular flowers are always together.
17. Find the number of ways in which 15 staff members can be seated around a circular table for a meeting if the vice-principal and dean have to be on either side of the Principal.
18. If $nC_8 = nC_{12}$, find nC_5 .
19. Find the number of ways in which a committee of 4 students and 2 lecturers can be chosen out of 10 students and 8 lecturers.
20. Find the numbers of straight lines and triangles that can be formed out of 20 points of which 8 are collinear.
21. Find the number of parallelograms that can be formed from a set of 6 parallel lines intersecting another set of 4 parallel lines.
22. Find the number of diagonals of a polygon of 20 sides.
23. In how many ways can 6 red and 4 white marbles be chosen from a bag containing 10 Red and 6 White marbles.
24. In how many ways can 6 people be chosen out of 10 people if one particular persons is always included.
25. A team of 8 players has to be selected from 14 players. In how many ways the selections can be made if two particular players are always excluded.

3 MARKS QUESTIONS

(Understanding)

1. Find the number of permutations of the letters of the word MISSISSIPPI. In how many of the arrangements.
 - (a) the 4 S's are together.
 - (b) The 4 S's are not together.
 - (c) begin with MISS.
2. Find the number of permutations of the letters of the word ASSASSINATION ;
In how many of these
 - (a) the vowels are in even places.
 - (b) vowels are in odd places.
 - (c) begin with A and end with A.
3. In how many ways can 7 English books 8 Kannada books and 5 Hindi books be arranged in a shelves. In how many of these
 - (a) No two English books are together.
 - (b) Books of the same language are together.
 - (c) All kannada books are together and all Hindi books are together.
4. How many 4 digit numbers can be formed using digits 0,1,2,3,4,5,6 (No digit can be repeated)
How many of them are
 - (a) Even,
 - (b) Odd,
 - (c) greater than 4,000.
5. How many 5 digit numbers can be formed using the digits 1,2,3,5,7,8,9 (no digit being repeated) How many of these are
 - (a) divisible by 5,
 - (b) Ending with 25,
 - (c) Less than 50,000.
6. How many four digit numbers can be formed using digits 0,2,3,5,7,8 (digits can be repeated)
 - (a) How many of them are even
 - (b) How many are divisible by 5
 - (c) How many are greater than 5300
7. If a convex polygon has 170 diagonals. Find the numbers of sides of the polygon.
8. A team of conveners consisting of 4 lecturers, 4 boys and 2 girls has to be selected from 15 lecturers 10 boys and 12 girls. In how many ways the selection can be made if the 2 lecturers who were conveners last year have to be included and 3 boys who failed in the examination cannot be chosen.
9. From a class of 9 boys and 7 girls, 12 students are to be chosen for a competition which includes atleast 6 boys and atleast 4 girls. In how many ways can this be done if a particular boy is always chosen.

BASIC MATHEMATICS

10. A man has 10 relatives, 4 of them are ladies, 3 gentlemen and 3 children. In how many ways can he invite 7 relatives to a dinner party so that
 - (a) there are exactly 2 ladies, 3 gentlemen and 2 children.
 - (b) there are exactly 2 gentlemen and atleast 3 ladies.
11. From a class of 12 boys and 10 girls, 10 students are to be chosen for a competition, including atleast 4 boys and atleast 4 girls. The 2 girls who won the prize last year should be included. In how many ways can the candidate select the questions.
12. A box contains 5 red, 4 black and 3 white balls. How many selections of 8 balls can be made if the selection contains
 - (a) exactly 4 red, 2 black and 2 white balls.
 - (b) atleast 3 red, atleast 3 black and atleast 1 white balls.
13. An examination paper consists of 12 questions divided into parts A & B. Part A contains 7 questions and part B contains 5 questions. A candidate is required to answer 8 questions selecting atleast 3 from each part. In how many ways can the candidate select the questions.
14. A man has 10 relatives, 4 of them are ladies, 3 gentlemen and 3 children. In how many ways can he invite 7 relatives to a dinner party so that
 - (i) there are exactly 2 ladies, 3 gentlemen and 2 children.
 - (ii) there are exactly 2 gentlemen and atleast 3 ladies.
15. A team of eleven is to be chosen out of 16 Cricket players of whom 4 are bowlers and 2 wicket keepers. In how many ways can the team be chosen so that
 - (i) there are exactly 3 bowlers and one wicket keeper.
 - (ii) there are atleast 3 bowlers and atleast one wicket keeper.
16. Out of 4 officers and 10 clerks in an office a committee consisting of 2 officers and 3 clerks is to be formed. In how many ways can this be done if
 - (i) Any officer and any clerk can be included
 - (ii) one particular clerk must be on committee
 - (iii) one particular officer cannot be on the committee.
