

- ① How many 3-digit numbers can be formed without using the digits 0, 2, 3, 4, 5, 6 if repetition is not allowed?
- ② Find the total no. of ways of answering 5 objective type questions, each question having 4 choices.
- ③ How many numbers are there between 100 & 1000 such that atleast one of their digit is 7?
- ④ Find the number of different signals that can be generated by arranging atleast 2 flags in order (one below the other) on a vertical staff, if 5 different flags are available.
- ⑤ If $P(n-1, 3) : P(n, 4) = 1 : 9$, find n .
- ⑥ If $2^{n+1} P_{n-1} : 2^{n-1} P_n = 3 : 5$, find n .
- ⑦ (i) If $56 P_{r+6} : 54 P_{r+3} = 30800 : 1$, find r .
- (ii) If $22 P_{r+1} : 20 P_{r+2} = 11 : 52$, find r .
- ⑧ Prove the following: -
- (i) $P(n, r) = P(n-1, r) + r \cdot P(n-1, r-1)$
- (ii) $P(n, r) = n \cdot P(n-1, r-1)$
- ⑨ In how many ways three different rings can be worn in four fingers with atmost one in each finger?
- ⑩ Three men have 4 coats, 5 waist coats and 6 caps. In how many ways can they wear them?

arranged, so that the best and the worst papers are never together?

- (12) Find the no. of arrangements that can be formed by using all the letters of the word "MATRIX" so that vowels may be in the even places.
- (13) How many four digit numbers are there with no digit repeated?
- (14) Find the number of 4 digit nos. that can be formed using the digits 1, 2, 3, 4, 5 if no digit is repeated. How many of these will be even?
- (15) In how many distinct ways can the product xy^2z^2 be written without using exponents?
- (16) In how many distinct permutations of the letters in MISSISSIPPI do the four I's not come together?
- (17) If the different permutations of the word EXAMINATION are listed as in a dictionary, how many items are there in this list before the first word starting with E?
- (18) How many numbers greater than 4,00,000 can be formed by using the digits 0, 2, 2, 4, 4, 5?
- (19) 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,
 - (iii) there are always 4 letters between P and S?

Permutation & Combination (contd.)
Q20 If ${}^{n-1}C_r : {}^nC_r : {}^{n+1}C_r = 6 : 9 : 13$, find n and r .

Q21 If n and r are natural nos, such that $1 \leq r \leq n$, then prove that ${}^nC_r + {}^nC_{r+1} = {}^{n+1}C_{r+1}$.

Q22 (i) find the value of

$${}^{15}C_8 + {}^{15}C_9 - {}^{15}C_6 - {}^{15}C_7$$

(ii) If $1000 {}^{98}C_98 = 999 {}^{97}C_{97} + x {}^{90}C_{90}$, find x .

Q23 Find the no. of ways in which a cricket team consisting of 11 players can be selected out of 14 players. Also, find out how many of these will include a particular player.

Q24 In a meeting after everyone had shaken hands with everyone else, it was found that 66 handshakes were exchanged. How many members were present at the meeting?

Q25 A polygon has 44 diagonals. Find the number of its sides.

Q26 Find the no. of diagonals that can be drawn by joining the vertices of an Octagon.

Q27 From 4 officers & 8 jawans, in how many ways can 6 be chosen (a) to include exactly one officer.
(b) to include at least one officer?

Q28 How many words, each of 3 Vowels & 2 consonants can be formed with the letters of the word "INVOLUTE"?

Q29 Find the number of permutations of letters of the word "KAPIL" beginning with K and ending with L.

Q30 There are 10 professors & 20 lecturers out of whom a committee of 2 professors & 3 lecturers to be formed. find
(i) in how many ways committee can be formed.
(ii) in how many ways a particular professor included.