

PROBLEM SET-07

- Q.1** If all the words formed with letters of the word "POTATO" are arranged in alphabetical order as they are done in a dictionary then the rank of the word "POTATO" is
 (A) 44 (B) 103 (C) 104 (D) none
- Q.2** A shelf contains 20 different books of which 4 are in single volume and the others form sets of 8, 5 and 3 volumes respectively. Number of ways in which the books may be arranged on the shelf, if the volumes of each set are together and in their due order is
 (A) $\frac{20!}{8!5!3!}$ (B) $7!$ (C) $8!$ (D) $7.8!$
- Q.3** If all the letters of the word "QUEUE" are arranged in all possible manner as they are in a dictionary, then the rank of the word QUEUE is
 (A) 15^{th} (B) 16^{th} (C) 17^{th} (D) 18^{th}
- Q.4** Number of six digit numbers in which sum of the squares of the digits is 9 is
 (A) 60 (B) 66 (C) 72 (D) 37
- Q.5** All the five digit numbers in which each successive digit exceeds its predecessor are arranged in the increasing order of their magnitude. The 97^{th} number in the list does not contain the digit
 (A) 4 (B) 5 (C) 7 (D) 8
- Q.6** Find the number of combination of 16 things, 8 of which are alike and the rest different, taken 8 at a time.
- Q.7** The number of different ways in which five 'dashes' and eight 'dots' can be arranged, using only seven of these 13 'dashes' & 'dots' is :
 (A) 1287 (B) 119 (C) 120 (D) 1235520
- Q.8** An old man while dialing a 7 digit telephone number remembers that the first four digits consists of one 1's, one 2's and two 3's. He also remembers that the fifth digit is either a 4 or 5 while has no memorising of the sixth digit, he remembers that the seventh digit is 9 minus the sixth digit. Maximum number of distinct trials he has to try to make sure that he dials the correct telephone number, is
 (A) 360 (B) 240 (C) 216 (D) none
- Q.9** There are $2n$ white and $2n$ red counters. Counters are all alike except for the colour. If the number of ways in which they can be arranged in a line so that they are symmetric with respect to a central mark is 70 then n equals to
 (A) 3 (B) 4 (C) 5 (D) 6

Paragraph for question nos. 10 to 12

16 players $P_1, P_2, P_3, \dots, P_{16}$ take part in a tennis tournament. Lower suffix player is better than any higher suffix player. These players are to be divided into 4 groups each comprising of 4 players and the best from each group is selected for semifinals.

Q.10 Number of ways in which 16 players can be divided into four equal groups, is $K \prod_{r=1}^8 (2r - 1)$, where K equals

- (A) $\frac{35}{27}$ (B) $\frac{35}{24}$ (C) $\frac{35}{52}$ (D) $\frac{35}{6}$

Q.11 Number of ways in which they can be divided into 4 equal groups if the players P_1, P_2, P_3 and P_4 are in different groups, is :

- (A) $\frac{(11)!}{36}$ (B) $\frac{(11)!}{72}$ (C) $\frac{(11)!}{108}$ (D) $\frac{(11)!}{216}$

Q.12 Number of ways in which these 16 players can be divided into four equal groups, such that when the best player is selected from each group, P_6 is one among them, is $(k) \frac{12!}{(4!)^3}$. The value of k is :

- (A) 36 (B) 24 (C) 18 (D) 20

Paragraph for question nos. 13 to 15

Different words are formed by arranging the letters of the word "SUCCESS".

Q.13 The numbers of words in which C are together but S 's are separated, is

- (A) 120 (B) 96 (C) 24 (D) 420

Q.14 The number of words in which no two C's and no two S are together is

- (A) 120 (B) 96 (C) 24 (D) 180

Q.15 The number of words in which the consonants appear in alphabetic order is

- (A) 42 (B) 40 (C) 420 (D) 280

Q.16 How many different arrangements are possible with the factor of the term $a^2 b^4 c^5$ written at full length.

Q.17 Find the number of 4 digit numbers starting with 1 and having exactly two identical digits.

Q.18 Number of ways in which 5 A's and 6 B's can be arranged in a row which reads the same backwards and forwards, is

Q.19 In a plane a set of 8 parallel lines intersects a set of n parallel lines, that goes in another direction, forming a total of 1260 parallelograms. Find the value of n .

ANSWER KEY

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|-----|-----|-----|-----|-----|------|-----|------|
| 1. | (C) | 2. | (C) | 3. | (C) | 4. | (D) |
| 5. | (B) | 6. | 256 | 7. | (C) | 8. | (B) |
| 9. | (B) | 10. | (A) | 11. | (C) | 12. | (D) |
| 13. | (C) | 14. | (B) | 15. | (A) | 16. | 6930 |
| 17. | 432 | 18. | 10 | 19. | 0010 | | |

