INDIAN SCHOOL MUSCAT
DEPARTMENT OF MATHEMATICS
CLASS XI
WORKSHEET NO. 7
PERMUTATIONS AND COMBINATIONS

1. Find r if
(i) ${}^{10}P_{r+1} : {}^{11}P_r = 30:11$ (Ans: 5)

2. Find n and r if ${}^{n}C_r : {}^{n}C_{r+1} : {}^{n}C_{r+2} = 1:2:3$ (Ans: $n = 14, r = 4$)

3. How many arrangements can be formed by the letters of the word VOWELS if
(i) there is no restriction (ii) each word begins with S and ends with E (iii) all vowels come together (iv) all consonants come together? (Ans: 720, 24, 240, 144)
.

4. How many words can be formed out of the letters of the word OBEDIENCE so that the vowels and consonants occur together? (Ans: 960)

5. In how many ways can final eleven be selected from 15 cricket players if
(i) there is no restriction (ii) one of them must be included (iii) one of them, who is in bad form, must always be excluded (iv) two of them being leg spinners, one and only one leg spinner must be included? (Ans: 1365, 1001, 364, 572)

6. A bag contains six white marbles and five red marbles. Find the number of ways in which four marbles can be drawn from the bag if (i) they can be of any colour (ii) two must be white and two must be red (iii) they must be of same colour. (Ans: 360, 150, 20)

7. Everybody in a room shakes hands with everybody else. The total number of shake hands is 66. How many people are there in the room? (Ans: 12)

8. A party is arranged for 18 people along two sides of a long table with 9 chairs on each side. Four men wish to sit on one particular side and three on the other side. In how many ways can they be seated? (Ans: ${}^{11}C_5\, 9!9!$)

9. Find the number of arrangements that can be made from the letters of the word INDEPENDENCE. In how many of these arrangements (i) the words start with P (ii) words start with I and end with P (iii) all the vowels occur together (iv) all the vowelsnever occur together? (Ans: 1663200, 138600, 12600, 16800, 1646400)

10. There are 18 points in a plane, no three of which are in the same straight line except 5 which are collinear. Find the number of (i) straight lines formed by joining them (ii) triangles formed by joining them. (Ans: 144, 806)

11. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these are the cards (i) of the same suit (ii) of the same colour (iii) face cards (iv) two of red and two of black (v) belong to different suits? (Ans: 270725, 2860, 29900, 495, 105625, 28561)

12. A candidate is required to answer 7 questions out of 12 questions, which are divided into two sections A and B, each containing 6 questions. He is not permitted to attempt more than 5

questions from either section. Find the number of different ways of selecting the questions. (780)

13. How many different words can be formed from the letters of the word GANESHPURI such that (i) the letter G always occupies the first place (ii) the vowels are always together (iii) all consonants come together (iv) vowels occupy even places.
(Ans: 362880, 120960, 86400, 86400)

14. A boy has 3 library tickets and 8 books of his interest in the library. Of these 8 books, he does not want to borrow Mathematics Part-II unless Part-I is also borrowed. In how many ways can he choose the three books to be borrowed? (Ans: 41)

15. How many 4-digit numbers divisible by 5 can be formed with the digits 0, 4, 5, 6, 7 if repetition of digits is not allowed? (Ans: 44)