1. The letters of the word OLYMPIAD are written in all possible ways. If all these words are written out as in a dictionary, then find the rank of the word POLYMIAD.

2. Numbers greater than 1000 but not greater than 4000 which can be formed with the digits 0, 1, 2, 3, 4 (repletion of digits is allowed) are

3. In a three-storey building, there are four rooms on the ground floor, two on the first and two on the second floor. If the rooms are to be allotted to six persons, one person occupying one room only, the number of ways in which this can be done so that no floor remains empty is

4. The sum of all the numbers of four different digits that can be made by using the digits 0, 1, 2 and 3 is

5. The last digit of $(1! + 2! + ..+ 2005!)^{500}$ is

6. To each element of the set $S = \{1, 2, \ldots\ldots, 1000\}$ a colour is assigned. Suppose that for any two elements a, b of S, if 15 divides a + b then they are both assigned the same colour. What is the maximum possible number of distinct colours used? PRMO 2013

7. At a party, each man danced with exactly four women and each woman danced with exactly three men. Nine men attended the party. How many women attended the party? PRMO 2015

8. How many positive integers less than 1000 have the property that the sum of the digits of each such number is divisible by 7 and the number itself is divisible by 3? PRMO 2017

9. There are five cities A, B, C, D, E on a certain island. Each city is connected to every other city by road. In how many ways can a person starting from city A come back to A after visiting some cities without visiting a city more than once and without taking the same road more than once? (The order in which he visits the cities also matters. e.g., the routes A → B → C → A and A → C → B → A are different.) PRMO 2017

ANSWER KEY

Ques.	1.	2.	3.	4.	5.	6.	7.	8.	9.
Ans.	34439	375	$^8P_6 - 2(6!)$	38664	1	8	12	28	60