PART – B :

Solution :

After transforming the dices according to loki conditions ,The Dice are :

New Die A : [1,2,2,3,3,4]

New Die B : [1,3,4,5,6,8]

Logic :

The conditions for the new dices are :

1.Die A can have atmost 4 spots on a face

2.Die A can have multiple faces with same number of spots

3.Die B can have more than 6 spots on a face

4.The probability of obtaining the sums should not be changed

By keeping these in mind lets start finding the new dices configuration

New Die A : []

New Die B : []

We know the frequencies of each possible sum from original dices . They are :

Sum Freq

2 1

3 2

4 3

5 4

6 5

7 6

8 5

9 4

10 3

11 2

12 1

So in the new dices these frequencies for the possible sums should be same and we have to keep the above conditions intact.

We know getting sum 2 is only possible by one combination i.e (1,1)

So it is confirm that each Die will have 1 as its first element .

Therefore , New Die A = [1]

New Die B = [1]

For getting a sum of 7 which occurs 6 times the combinations are (1,6),(2,5),(3,4),(4,3),(5,2),(6,1).Out of which the combinations (5,2) and (6,1) are not possible as New Die A can only have 4 spots in a face . So we need to use these 5 and 6 in New Die B inorder to balance the probability.

Therefore , New Die A = [1,2,3,4]

New Die B=[1,3,4,5,6]

Still the frequency of getting 7 is 4 i.e. (1,6),(2,5),(3,4),(4,3).So inorder to compensate the probability we have to add duplicates to the New Die A where the options are between 1 and 4.

We cannot take because it will increase the probability of sum 2 which is not correct

We are left with 2 to 4 which should be based on other sums frequencies of remaining numbers

Now we can use backtracking from that index to simply find the remaining faces in Die A and Die B.

Finally The Solution Will be

New Die A : [1,2,3,4,2,3]

New Die B : [1,3,4,5,6,8]