25. All the digits of a number are different, the first digit is not zero, and the sum of the digits is 36. There are $N \times 7!$ such numbers. What is the value of N?

A 72 B 97 C 104 D 107 E 128

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25. D The sum of 10 different digits is 45. As the sum of the digits in the question is 36 then digits adding to 9 are omitted.

The combinations of digits satisfying this are:

$$9;\ 1+8;\ 2+7;\ 3+6;\ 4+5;\ 1+2+6;\ 1+3+5;\ 2+3+4.$$

When '0' is not involved there are $(8! + 4 \times 7! + 3 \times 6!)$ numbers, whereas when '0' is used there are $(8 \times 8! + 4 \times 7 \times 7! + 3 \times 6 \times 6!)$.

This gives a total of $9 \times 8! + (4+28) \times 7! + (3+18) \times 6! = (72+32+3) \times 7! = 107 \times 7!$

Hence $N = 107$.