$$S = \sum_{\substack{3n_3+2n_2+n_1=18 \\ n_3+n_2+n_1 \leq 10}} \frac{18!}{(3!)^{n_3}(2!)^{n_2}} \times \frac{\frac{9\times 9!}{(10-n_3-n_2-n_1)!}}{n_3!\ n_2!\ n_1!}$$

Computing can be done without overflow in 64 bits by :

$$\frac{18!}{(3!)^{n_3}(2!)^{n_2}\ n_1!} \times \frac{9 \times 9!}{(10-n_3-n_2-n_1)!\ n_3!\ n_2!}$$