Help

G1 (1/1 point)

Using 5 numbers 1，2，3，4, 5 to fill in 1x6 grids, each grid is filled with one digit. If there are odd number of grids that have 1 written on them, and an even number of grids with 2, then how many arrangements there for 1*6 grids?

3906

3906

Answer: 3906

EXPLANATION

$$G(x)$$
$$= \left(1+\frac{x^2}{2!}+\frac{x^4}{4!}+\cdots\right)\left(\frac{x}{1!}+\frac{x^3}{3!}+\cdots\right)\left(1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+\cdots\right)^3$$
$$= \left(\frac{e^x+e^{-x}}{2}\right)\left(\frac{e^x-e^{-x}}{2}\right)(e^x)^3$$
$$= \frac{e^{5x}-e^x}{4} = \frac{1}{4}\sum_{n=0}^{\infty}(5^n-1^n)\frac{x^n}{n!}$$
$$B_6 = \frac{5^6-1}{4} = 3906$$

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