

Assignment

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1st September, 2021

Ans for (a)

The Partiton fucntion is

$$Z[J] = \mathcal{N}_0 e^{V[\frac{\partial}{\partial J_i}]} e^{\frac{1}{2} J_m \Delta_{mn} J_n} \quad (1)$$

Taylor expanding $e^{V[\frac{\partial}{\partial J_i}]}$ where