Assignment 12

The due date for submitting this assignment has passed.

Due on 2021-04-14, 23:59 IST.

1) After adopting an appropriate parameterization, which of the following, below, are an integral for the interaction energy $E_I$?

- $E_I = \int \sum \left( -\Delta \phi_a + \Delta \phi_b \right) u^2 \, dV(\phi)$
- $E_I = \int \sum \left( -\Delta \phi_a + \Delta \phi_b \right) \phi \, dV(\phi)$
- $E_I = \int \sum \left( -\Delta \phi_a + \Delta \phi_b \right) \phi^2 \, dV(\phi)$
- $E_I = \int \sum \left( -\Delta \phi_a + \Delta \phi_b \right) \phi \, dV(\phi)$

None of the above is correct.

2) Integrate the expression from question 1 by treating it as a hypergeometric integral, which of the following, below, expresses the interaction energy $E_I$?

- $E_I = \frac{\pi a}{2} A \left( \begin{array}{c} \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \end{array} \right)$
- $E_I = \frac{\pi a}{2} A \left( \begin{array}{c} \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \end{array} \right)$
- $E_I = \frac{\pi a}{2} A \left( \begin{array}{c} \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \end{array} \right)$
- $E_I = \frac{\pi a}{2} A \left( \begin{array}{c} \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \end{array} \right)$

None of the above is correct.

3) Which of the following is a quadratic transformation which will convert the hypergeometric function into a form which relates to the Cholesky polynomials of the second kind $E_I(x)$?

- $F(a, b; 2a; x) = \frac{x^{-a} - 1}{1 - x}$
- $F(a, b; 2a; x) = \frac{x^{-a} - 1}{1 - x}$
- $F(a, b; 2a; x) = \frac{x^{-a} - 1}{1 - x}$
- $F(a, b; 2a; x) = \frac{x^{-a} - 1}{1 - x}$

None of the above is correct.

4) Which of the following is the expression for $E_I$ in terms of the parameters $a$ and $b$ and the Cholesky polynomials of the second kind $E_I(x)$?

- $E_I = \frac{\pi a}{2} A \left( \begin{array}{c} \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \end{array} \right)$
- $E_I = \frac{\pi a}{2} A \left( \begin{array}{c} \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \end{array} \right)$
- $E_I = \frac{\pi a}{2} A \left( \begin{array}{c} \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \end{array} \right)$
- $E_I = \frac{\pi a}{2} A \left( \begin{array}{c} \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \end{array} \right)$

None of the above is correct.