Quiz 1
February 11, 2019

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1. Which of the following is equal to $\langle pq \,||\, rs \rangle$?

   (A) $\int_\tau d\tau \; \chi_p^*(1)\chi_q(1)\frac{1}{r_{12}}\chi_r^*(2)\chi_s(2)$

   (B) $\int_\tau d\tau \; \chi_p^*(1)\chi_q(2)\frac{1}{r_{12}}\chi_r^*(2)\chi_s(1)$

   (C) $\int_\tau d\tau \; \chi_p^*(1)\chi_q^*(2)\frac{1}{r_{12}}\chi_r(1)\chi_s(2)$

   (D) $\int_\tau d\tau \; \chi_p^*(1)\chi_q^*(2)\frac{1}{r_{12}}\chi_r(2)\chi_s(1)$

   (E) $\boxed{None\,of\,the\,above.}$

2. Write a Slater determinant for a 3-electron system using the independent particle model where the wave function is constructed from 3 spin orbitals χ_a, χ_b, and χ_c. Number the electrons as 1, 2, and 3.

$$|\Psi\rangle = \frac{1}{\sqrt{3!}} \begin{vmatrix} \chi_a(1) & \chi_b(1) & \chi_c(1) \\ \chi_a(2) & \chi_b(2) & \chi_c(2) \\ \chi_a(3) & \chi_b(3) & \chi_c(3) \end{vmatrix}$$