

140. The number of microstates that are possible, when two particles are distributed in four states such that the resulting wave functions are antisymmetric with respect to exchange of the particles, is
 (a) 16 (b) 12 (c) 8 (d) 6

141. A Slater determinant corresponding to the ionic part of the ground state valence bond wave function of H_2 molecule is ($1s_a\alpha, 1s_a\beta, 1s_b\alpha, 1s_b\beta$ are atomic spin-orbitals of hydrogen atoms a and b of the hydrogen molecule)

(a) $\begin{vmatrix} 1s_a\alpha(1) & 1s_a\beta(1) \\ 1s_a\alpha(2) & 1s_a\beta(2) \end{vmatrix}$ (b) $\begin{vmatrix} 1s_a\alpha(1) & 1s_b\beta(1) \\ 1s_a\alpha(2) & 1s_b\beta(2) \end{vmatrix}$ (c) $\begin{vmatrix} 1s_a\alpha(1) & 1s_b\alpha(1) \\ 1s_a\alpha(2) & 1s_b\alpha(2) \end{vmatrix}$ (d) $\begin{vmatrix} 1s_a\alpha(1) & 1s_b\beta(1) \\ 1s_a\alpha(1) & 1s_b\beta(2) \end{vmatrix}$

142. When $T \rightarrow \infty$, value of the single-particle partition function will be (given : degeneracy of level $j = g_j$)

(a) 1 (b) g_0 (c) $\sum_j g_j$ (d) $\frac{1}{\sum_j g_j}$

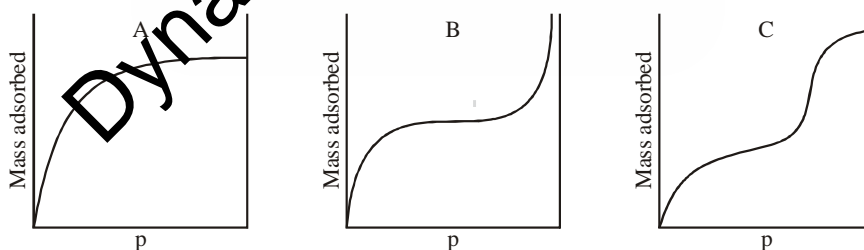
143. The rate constant for a reaction $A^{1+} + B^{n+} \rightarrow P$ is measured in two different aqueous solutions of ionic strengths 0.01 M and 0.04 M. If $\log \frac{k_{0.04}}{k_{0.01}} = 0.3$, the charge n on B is closest to

(a) 1 (b) 2 (c) 3 (d) 6

144. According to Hückel theory, the π electron charge on the central carbon atom in propenyl cation $(CH_2CHCH_2)^+$ is (in units of electronic charge)

(a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) 1 (d) 2

145. Among the following figures, the variations of mass adsorbed with pressure for a monolayer and a multilayer are represented by



- (a) A and C respectively (b) A and B respectively
 (c) C and A respectively (d) B and A respectively