

Instructions: Answer all questions within the space provided.

Max Marks: 11 (3 + 2 + 2 + 2 + 2)

(1) Following is a potential energy contour corresponding to two degrees of freedom. The six minima are labelled already. Identify and trace the most probable paths by which (a) it goes to g^*c ; (b) it goes to g^*c ; (c) identify one second order saddle point and the corresponding two transition states to which the second order point connects.

(2) State and explain variation in the ore.

(3) The Schrodinger equation of H_2 molecule cannot be solved analytically even after using the Born-Oppenheimer approximation. Write the Schrodinger equation and explain.

the law in the international representation for $\text{CH}_3\text{-NH}_2$.

(5) Write the complete Hamiltonian for He-H molecule.