CHEM106 Quiz 1
Please show all equations, all substitutions, all units, and all work to receive any credit

1. The activation energy (E_a) for a chemical reaction represents the amount of energy required for the reaction to occur. Enzymes speed up chemical reactions by lowering activation energies. At a physiological temperature of 37°C, calculate how much faster an enzyme-catalyzed reaction (having an Ea = 20 kJ/mole) would occur compared to the uncatalyzed same reaction having an activation energy of 100,000 J/mole.

2. Write the chemical equation for the reaction of HCOOH with water; show the Lewis structure of all reactants and products. Show all full charges (not partial charges), all bonds, and all lone electron pairs.

3. Draw two methanol molecules (CH_3OH) and clearly show the orientation of the two molecules with respect to one another that shows their greatest attraction for each other. Show all atoms and all bonds for both molecules and clearly label appropriate interactions between them.

4. For the two methanol molecules, sketch a graph clearly showing how the potential energy would change as the two molecules approached each other. Fully and clearly label your graph.

5. Viscosity is the resistance to flow (think cold syrup). Compare the viscosity of butane (C_4H_{10}) with that of octane (C_8H_{18}). Clearly support your answer with sound reasoning and with appropriate diagrams.