HL Questions on Nucleophilic substitution

1. Explain the following statements:

i. hydroxide ions are better nucleophiles than water molecules.

ii. the hydrolysis of iodoethane is faster than the hydrolysis of bromoethane.

iii. the hydrolysis of 2-bromo-2-methylpropane is faster than the hydrolysis of 1-bromobutane.

iv. fluoroethane does not react with dilute sodium hydroxide solution to form ethanol.

2. Explain the mechanism for the reaction of ammonia with bromoethane. (Use curly arrows to show the movement of pairs of electrons.)

3. i. Explain why the substitution of primary halogenoalkanes by hydroxide ions could also be classed as a Lewis acid-base reaction.

ii. Explain whether the reaction of tertiary halogenoalkanes with hydroxide ions could also be classed as a Lewis acid-base reaction.

4. Suggest how tetramethylammonium bromide, $(CH_3)_4N^+Br^-$, could be made from bromomethane.