$$K_C$$

1. a) All the substances are present in the same phase. (Although in most cases you will come across, everything would be present in the same state, these definitions for homogeneous and heterogeneous are actually in terms of "phase" to allow for the possibility of two immiscible liquids.)

    b) $K_C = \dfrac{[CH_3CH_2OH]}{[CH_2=CH_2]\,[H_2O]}$

    c) These imply that the values are for concentrations in mol dm^{-3}.

2. a) Substances are present in more than one phase.

    b) $K_C = \dfrac{[H_2]\,[CO]}{[H_2O]}$

3. You have to be careful here - these are a mixture of homogeneous and heterogeneous equilibria. You **must** look carefully at the state symbols.

    a) $K_C = \dfrac{[NH_3]^2}{[N_2]\,[H_2]^3}$

    b) $K_C = [CO_2]$

    c) $K_C = \dfrac{[SO_3]^2}{[SO_2]^2\,[O_2]}$

    d) $K_C = \dfrac{[CH_3COOH]\,[CH_3CH_2OH]}{[CH_3COOCH_2CH_3]\,[H_2O]}$

    e) $K_C = \dfrac{[Cu^{2+}]}{[Ag^+]^2}$

4. $A + 2B \rightleftharpoons C + D$