Summary: Third Midterm Exam (31 November 2005)

What you should know or be able to do...

1) Calculate partial derivatives and complete differentials.

2) Integrate simple polynomials and exponential functions.

3) Calculate the vapour and liquid composition of ideal binary mixtures.

4) Apply the lever rule.

5) Understand the basic idea behind distillation.

6) Draw and label phase diagrams and cooling curves.

7) Calculate freezing point depression, boiling point elevation and osmotic pressure.

8) Calculate molar volume.

9) Calculate the work needed to create liquid surface.

10) Determine capillary rise (assuming hemispherical surface) – Laplace equation.

11) Calculate the pressure inside a cavity.

12) Calculate the vapour pressure above a curved surface – Kelvin equation.

13) Calculate equilibrium constant and standard Gibbs energy of a chemical reaction.

14) Express the equilibrium constant at different temperatures – van't Hoff equation.

15) Relate K to K_x.

16) Calculate heat or matter flux in simple cases.

17) Calculate collision flux and related quantities.

18) Apply the root mean square expressions.

19) Relate hydrodynamic radius, diffusion coefficient and viscosity.

20) Calculate concentration at a given time and distance in various diffusion schemes.