**Fall 2005**
**CEE 432/532**
**Quiz ~~#1~~ #2**

**1. Fill in the blanks:** [10]

(a) Change in storage of mass = mass transported in – mass transported our + mass produced by source – mass eliminated by sink.

(b) Steady state is a condition in which concentrations do not change with time. .

(c) Steady state assumptions should not be invoked when a transient situation exists.

(d) There are primarily two kinds of physical processes by which chemicals are transported in fluids: advection and [Cont'd to (e)]

(e) diffusion.

(f) Vertical advection in air or water resulting from density differences is called convection

(g) Enthalpy is the energy possessed by a mixture of chemicals in a system.

(h) Entropy is the randomness of the system.

(i) If $\Delta G = - RT \ln Q$, the system is in eq.

(j) At low ionic strength, the activity coefficient, $\gamma$ becomes very close to 1.

**2. A one-kg soil sample is analyzed for TCE. The analysis indicated that the sample contains 5 mg of TCE. The TCE concentration (in ppm) is most nearly:** [2]

(A) $5 \times 10^{-6}$
(B) 0.5
(C) 5.0
(D) none of the above.

**3. A water contains 1.3 X $10^{-3}$ moles per liter of HCl (H = 1, Cl = 35.5). [4]**
**The pH of the water is most nearly:**

(A) 2.28
(B) 2.58
(C) 2.88
(D) none of the above.

$-\log_{10}[1.3\times10^{-3}]$

$= 2.88$

**4. A water contains two nitrogen species. The concentration of NH3 is [4]**
**30 mg /L and the concentration of NO3- is 5 mg/L. The total nitrogen concentration (in mg N/L) is most nearly:**

(A) 35.00
(B) 150.00
(C) 25.8
(D) 13.33