A general chemistry II (CHM 2046) potentially useful information, exam III

1 amu = 1.6605 × 10⁻²⁴ g  e = 1.602 × 10⁻¹⁹ C
°C = ⁵/₉ (°F – 32)  °F = ⁹/₅ °C + 32  K = °C + 273.15
Nₐ = 6.022 × 10²³  1 J = 1 kg·m²/s²  1 Pa = 1 N/m²  1 cal = 4.184 J (exactly)
1 atm = 101.325 kPa = 760 mm Hg (exactly) = 760 torr (exactly) = 29.921 in Hg = 1.01325 bar

PV = nRT  R = 0.08206 L·atm/mol·K  P¹ = X¹ P total  Standard molar volume at STP is 22.41 L

q = s·m·ΔT  ln P = - ΔH°/RT + C  ln (P₂/P₁) = -ΔH°/R (1/T₂ - 1/T₁)  S₉ = k P₉

P_A = X_A P°_A  ΔT_b = K_b m  ΔT_f = K_f m  π = MRT

A = e^(ln A) = ln(e^A)  ln (A/B) = ln A – ln B  ln A⁺ = x ln A  e^(A-B) = e^A / e^B


k = Ae^(-E_a/RT)  (a – b)² = a² – 2ab + b²  x = -b ± √(b² - 4ac) / 2a  are the solutions for ax² + bx + c = 0.

pH = -log[H₃O⁺]  pOH = -log[OH⁻]  pKa = -log K_a  K_w = 1.0 x 10⁻¹⁴ at 25 °C  K_a x K_b = K_w

Percent ionization = [H⁺]_{equilibrium} / [HA]_{initial}  pK_a = log [conjugate base] / [acid]

S = k ln W  k = 1.381 x 10⁻²³ J/K  ΔS = q_{rev} / T  ΔS_{univ} = ΔS_{sys} + ΔS_{surr}

ΔS°_{rxn} = Σ nS°(products) – Σ mS°(reactants)  ΔH°_{rxn} = Σ nΔH_f°(products) – Σ mΔH_f°(reactants)

ΔG = ΔH – TΔS  ΔG°_{rxn} = Σ nΔG_f°(products) – Σ mΔG_f°(reactants)

ΔG = ΔG° + RTlnQ  ΔG° = -RTln K  ΔG = -w_{max}

E = E°_{red}(cathode) – E°_{red}(anode)

F = 96,485 C/mol  ΔG = -nFE  E = E° – (RT/nF)ln Q

Do not turn or remove this page until you are told to begin the exam.

Write your name, then write and bubble your n-number (00xxxxxxx) and test form letter (after starting exam, see next page) on the RED ParSCORE form.

Failure to do so will result in a score of zero for the multiple choice portion of the exam.

Each problem has ONE BEST ANSWER. Bubble in your answers on the RED ParSCORE. Bubble both A and B to indicate AB. No extra time will be given to transfer answers to the Scantron sheet. You may remove the top sheet of the exam after you have been given instructions to begin the exam. Use correct significant figures, include units, and show all work for numerical problems to receive credit.