Answer Sheet for CHE654 Homework Set #5
(100 Points)

Note: **For all problems, submit a copy of your process flow diagram and a copy of your input summary of the process.**

34. (20 points) *Double-Effect Evaporator*

(a) Don't forget to submit the process flowsheet and input summary!

   The required physical property parameters for sugar in IDEAL are: _____

   _____

   _____

   _____

   The redundant data are: _____

(b) The mass fraction of sugar from the concentrated liquor of the second evaporator

   is _____

35. (20 points) *Separation of Compound X, I*

 (a) Redundant parameters: _____

   Required but missing parameters: _____

   _____

(b) Thermal diffusivity of column bottom stream = _____ cs

   Column bottom flow rate = _____ lbmolhr

38. (20 points) *Property Requirements and PCES, I*

   (a) Required parameters in UNIQ–RKS are:

   _____

   _____

   _____

(b) Values of estimated parameters:

MW = _____; T_C = _____ K; P_C = _____ N/m^2

V_C = _____ m^3/kmol; Z_C = _____; CPIG at 300 K = _____ J/kmol-K

DHFORM = _____ J/kmol; DGFORM = _____ J/kmol

Vapor pressure at T_B = _____ N/m^2; OMEGA = _____

DHVLB = _____ J/kmol; VB = _____ m^3/kmol

(c) At T = 500 °F , C_P^{IG} = _____ Btu/lbmol-R

   At T = 32 °F , C_P^{IG} = _____ Btu/lbmol-R

(d) Hv^{IG} (ideal gas enthalpy) of 2-BHA at 500 °F = _____ Btu/lbmol

   H_L (liquid enthalpy) of 2-BHA at 500 °F = _____ Btu/lbmol

(e) The UNIQ – RKS is a good choice for representing the properties of this system

   because_____

   _____

   _____

   Two more property methods that are appropriate are: _____

40. (20 points) ***Extractive Distillation, I***

(a) Mole purity of MCH in the overhead stream of the first column = _____ mole%

   Mole purity of toluene in the overhead stream of the second column = _____ mole%

(b) The final value of D/F ratio in the second column = _____

(c) Submit plots of the densities (vapor and liquid) as a function of tray number

43. (20 points) ***Purifying a Wastewater Stream***

   Condenser temperature in Column 1 = _____ °C

   Molar distillate to feed ratio in Column 2 = _____