Answer Sheet for CHE654 Homework Set #6
(100 points)

40. (25 points) *Purifying a Wastewater Stream*

Condenser temperature in Column 1 = _____ °C

Molar distillate to feed ratio in Column 2 = _____

42. (25 points) *Flowsheet Convergence, II*

(a) Scheme 1: Tear streams: _____

Your convergence algorithm: _____

Scheme 2: Tear streams: _____

Your convergence algorithm: _____

Total flow rate of Stream 6 = _____ lbmol/hr

Mole fraction of benzene in Stream 4 = _____

Mole fraction of *n*-butane in Stream 7 = _____

(b) **Your convergence scheme 1:** (Be very specific with your answer, e.g. what algorithms were used to converge tear streams and design-specs and whether the convergence was simultaneous or nesting, and if nesting what was the order of nesting.)

_____

_____

_____

_____

Your convergence scheme 2: (Be very specific with your answer, e.g. what algorithms were used to converge tear streams and design-specs and whether the convergence was simultaneous or nesting, and if nesting what was the order of nesting.)

_____

_____

_____

_____

Vapor fraction in FLASH-1 = _____

Vapor fraction in FLASH-2 = _____

43. (25 points) ***Flowsheet Convergence, III***

(a) Using A+ and automatic convergence and sequencing (Level 1), determine the water feed flow in Stream Feed and the split fraction in Block B going to Stream 2.

Water flow rate in Stream Feed = _____ lbmol/hr

Split fraction in Block B going to Stream 2 = _____

Also, write down the CPU seconds required by your computer to converge this flowsheet.

Simulation time in CPU seconds: _____

(b) You undoubtedly noticed that, because of the nesting of various loops, this problem took some time to converge (on my laptop, this CPU time was nearly 50 seconds before Report Writer is entered). Propose **two** different Level 3 convergence schemes and use them to converge the flowsheet in Part (a) again. Your aim is to cut down the CPU time by half or less. In both cases, you are not allowed to initialize the tear streams and each run must start with a re-initialization, i.e. purge all the results first before running the model.

Briefly write down your two schemes:

Scheme 1:

_____

_____

CPU seconds of Scheme 1: _____

Scheme 2:

_____

_____

CPU seconds of Scheme 2: _____

45. (25 points) ***Flowsheet Convergence, V***

(a) Answer the following questions:

Your convergence scheme:

_____

_____

_____

Total flow rate of Stream 11 = _____ lbmol/hr

(b) Answer the following questions:

Your convergence scheme:

_____

_____

_____

Split fraction of SPLIT-1 for Stream 5 = _____