Answer Sheet for CHE654 Homework Set #1
(100 points)

1. (10 points) *Degree of Freedom Analysis*
Write down all the required standard input and indicate if they are missing:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

The number of missing standard input = _____

The number of design targets (constraints) given = _____

Therefore, the problem is 1. Under-specified, 2. Over-specified, or 3. Fully Specified. (Circle one answer)

2. (30 points) *Mass Balances and Constraints with Elementary Modules, I*

Number of missing standard input = _____

Number of constraints = _____

Check one: The problem is: [ ] under-specified [ ] fully specified [ ] over-specified

Streams	Component Flow Rates (lbmol/hr)			Total Flow
	A	B	C	
S1	120	0	0	120.000
S2				
S3			92.880	223.200
S4				
S5				

3. (30 points) *Mass Balances and Constraints with Elementary Modules, II*

Number of missing standard input = _____

Number of constraints = _____

Check one: The problem is: [ ] under-specified [ ] fully specified [ ] over-specified

Streams	Component Flow Rates (lbmol/hr)			Total Flow
	A	*B*	*C*	
S1	82	0	0	82
S2				
S3				
S4	0			
S5				84.3
S6	18	0		

For Part (c), simply enter the standard input data obtained from Part (b) into your A+ model and verify that A+ produces the same answers as those obtained by hand calculations. Submit your A+ .bkp file.

6. (30 points) *Using A+ to Solve a Mass Balance Problem with Standard Input and Design-specs*

(a)

Complete the following table:

Streams	Component Flow Rates (lbmol/hr)				
	A	B	C	D	Total Flow
S1	60	40	0	0	100.00
S2					
S3					
S4					
S5					

(b)

Complete the following table:

Streams	Component Flow Rates (lbmol/hr)				
	A	B	C	D	Total Flow
S1			0	0	
S2					
S3			18		
S4					
S5					20

Total flow rate of Stream S1 = _____

Fractional conversion based on H_2 in Reactor 1 = _____

%Mole-recovery of *i*-butane in Stream S4 = _____

 Remember to submit your A+ .bkp file.