HOMEWORK 3

PROBLEM 1

- The molar flowrates of the various components in the reactor effluent:
  Ethanol => 0.572862 kmol/hr
  DEE => 1.51357 kmol/hr
  Water => 1.51357 kmol/hr

- The operating temperature of the partial condenser => 40.283 C

- The molar flowrates & compositions of the overhead & bottom streams leaving the partial condenser:

	Molar Flowrate (kmol/hr)	Composition
Overhead	1.66893	Ethanol => 7.42, DEE =>86.26, Water => 6.32
Bottom	1.93107	Ethanol => 23.25, DEE =>3.83, Water => 72.92

- The heat duty of the partial condenser => -37816.8kcal/hr

PROBLEM 2

- Molar flowrate => 68.4946kmol/hr
- the required heat transfer area of the heat exchanger for a heat transfer coefficient of 730 kcal/(h.m^2 C) => 0.3613SQM