King Saud University

Petroleum and Natural Gas Engineering Department

PGE 362: **Properties of Reservoir Fluids**

Thursday, December 29, 2016 Due: Sunday, January 1, 2017

**Mid Term Exam 2 (Take home exam)**

A hydrocarbon system has the composition given in the table below. Assume non-ideal solution behavior and for pressure values (P=50, 100, 150, 200 psia) and temperature values (T=100°F) and by assume Lv range from 0.01 to 1.0 with 0.01 incremental step.

Do the following;

1. Calculate the composition of the liquid and vapor for each Lv at the given pressure and temperature.
2. Plot summation of X vs. Lv for each pressure and temperature values.
3. From the plots estimate Lv and calculate composition of vapor.
4. Compare the plots you obtained and discuss the results.

|  |  |
| --- | --- |
| **Component** | **Mole fraction** |
| CH4 | 0.15 |
| C2H6 | 0.05 |
| C3H8 | 0.25 |
| *i*-C4H10 | 0.05 |
| *n*-C4H10 | 0.15 |
| *n*-C5H12 | 0.25 |
| *n*-C6H14 | 0.10 |