Procedure:

1. Put the pressure-controlled expander in the circuit (AXV open, CTV and TXV closed). Set both the evaporator and condenser fans at high. Using the control at the bottom of the expander, set the suction pressure at 2psig. Record temperatures, pressures, refrigerant flow rate and power

used to run the compressor and fans. Record the power to run the compressor. Repeat with

suction pressures of 7, 15 and 30psig. Make sure that approximate equilibrium conditions are

attained. Take pressure and temperature readings after waiting for 3-5 minutes at each setting

to assure that equilibrium conditions have been achieved.

2. Switch over to the thermally-controlled expander. Obtain data as in Task I above. Obtain a

second data set with the condenser fan set at low, having the evaporator fan set at high.

3. Switch over to the capillary tube expander. Obtain data sets with the fans set as follows:

(i) both fans high, (ii) evaporator fan high, condenser fan low, and (iii) evaporator fan low,

condenser fan high. Remember to allow the refrigerator to come to equilibrium before going to

the next set point. Data should be recorded at regular intervals to see if equilibrium has been

reached. Keep an eye on the power being drawn by the compressor and fans. A significant

change in the power being drawn could prevent the attainment of equilibrium.

Calculations:

First, we convert all the data into metric system. We assume that the fluid at the measured temperature *T1* and use the saturation property table to find *hf* and *sf*. Interpolation is done by a Matlab script, shown in the appendix.