1. Design a common base amplifier shown below with the following specifications:

- $A_v = 10$
- $I_C = 1 \text{ mA}$
- $C_1 = C_2 = 20 \mu F$
- $C_E = 330 \mu F$
- $R_L = 10 \text{ k}\Omega$
- $R_B = 100 \text{ k}\Omega$
- $V^+ = -V^- = 15 \text{ V}$
- $R_C = 7.5 \text{ k}\Omega$

For the design calculations assume that the Early voltage is infinity, $\beta = 100$, the thermal voltage is 25.9 mV, and that the dc voltage drop from base-to-emitter is 0.65 V for each transistor.

2. Simulate the circuit designed in Problem 1 with SPICE. Use the SPICE parameters for the NPN transistors:

- $\beta = 100$
- $V_A = 170 \text{ V}$
- $I_S = 6.734 \text{ fA}$
- $r_x = 10 \Omega$
- $\tau_F = 301.2 \text{ ps}$
- $c_{jco} = 3.638 \text{ pF}$

Obtain the dc operating point, an ac analysis, and a transient analysis sufficient to show the clipping behavior.