Assume silicon, room temperature, complete ionization.

1. An MOS device has the following high-frequency C-V curve. Draw the band diagrams (include the gate electrode and the gate oxide, label the Fermi levels) at bias points A and B. Neglect interface charge.

2. Consider an nMOSFET with a gate oxide thickness of 15 nm and p-type substrate doping of $5 \times 10^{16}$/cm$^3$. The interface charge is negligible. What is the potential drop across the oxide
   (a) at the threshold condition?
   (b) at a gate voltage of 2.0 V above the threshold?
   (c) at the new threshold condition with a 2.0 V reverse bias on the substrate?