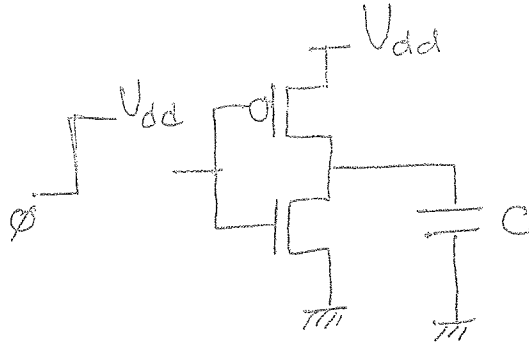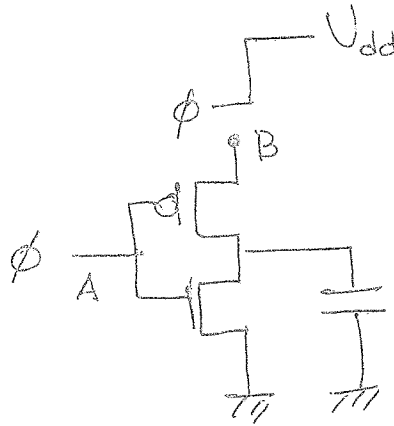1. Consider the inverter shown in the following figure where a step function is applied to the input of the inverter. Assume that the output fall time, t_f, is defined to be from 0.9Vdd to 0.01Vdd of the output. Analytically determine t_f. Use long channel equations for transistors operating in linear and saturation region. Also assume leakage current to be negligible. State any assumptions that you make. (70)

2. Consider the circuit shown in the following figure. A step function is applied to terminal B. Determine the energy consumption. Show all the steps of your derivation. (30)