ECE 342: Electronic Circuits **Summer 2026**
Problem Set #2 **Due Date: 5pm, Fri, Jun 26, 2026**

1. For a diode, given that the saturation current $I_s = 2 \times 10^{-14}$ A at room temperature, $T = 300°K$, and doubles with each 7°K increase in T.

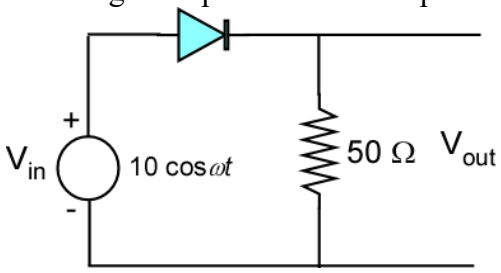
(a) Calculate I_s at $T = 350°K$.

(b) Find the temperature at which $I_s = 8 \times 10^{-14}$ A.

(c) Calculate the diode current at room temperature, if a voltage of 0.65 V is applied in the forward direction.

2. The depletion-layer capacitance for an abrupt junction diode is measured to be 5.2 pF at a reverse bias of 0.6 V. If the barrier voltage is 0.9 V, calculate the expected capacitance for a reverse bias of 12 V.

3. In the half-wave rectifier shown, the forward-biased diode can be represented as a 0.6-V voltage source. Calculate the dc voltage component of the output.



4. Plot the approximate output voltage of the clamping circuit shown for two cycles of input signal. What will the dc voltage of the output become after several input cycles? Assume the forward diode voltage is 0.7 V.