Special Problem 3.3-10

The circuit below includes one small-signal voltage source $v_s$.

The two junction diodes are not identical: $D_1$ has ideality factor $n=1.0$, while $D_2$ has an ideality factor $n=2.0$.

I have performed a DC analysis of this circuit (so you don’t have to!), and have determined that:

1. $D_1$ is forward biased, with $I_{D1}=10.0$ mA
2. $D_2$ is forward biased, with $I_{D2}=1.0$ mA

Now, you perform the small-signal analysis, and:

1. Draw precisely the small-signal circuit, with numeric values for each resistor.
2. Determine (in terms of $v_s$), the small-signal voltages across each diode (i.e., $V_{d1}$ and $V_{d2}$).