Problem 7-1

$dv/dt = 800$ V/μs, $i_{J2} = 12$ mA. Since $d(C_{J2})/dt = 0$, we can find the critical value of dv/dt from Eq. (7-6)

$dv/dt = 800$ V/μs $= i_{J2}/C_{J2} = 12 \times 10^{-3}/C_{J2}$ or $C_{J2} = 15$ pF

Problem 7-3

$C_{J2} = 15$ pF, $i_{J2} = 5$ mA, $dv/dt = 200$ V/μs

The effective capacitance $C_e = C_s + C_{J2}$

$dv/dt = 200 \times 10^6 = i_T/C_e = 5 \times 10^{-3}/C_e$ or $C_e = 25$ pF

$C_s = C_e - C_{J2} = 25 - 15 = 10$ pF