e) Plot Z vs. t for each cell when S changed to 100

Initial Conditions

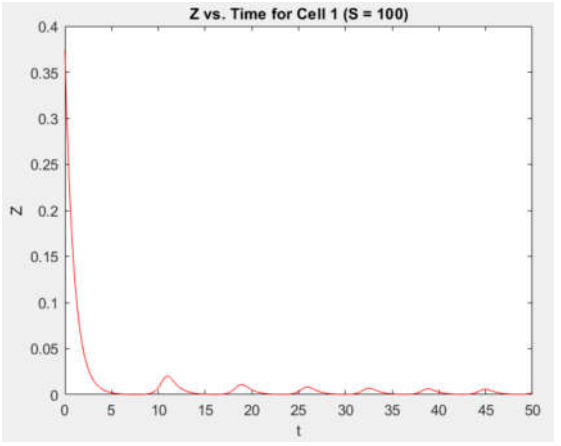
cell 1 ⇒ X = -0.0047, Y = 0.0137, Z = 0.3738

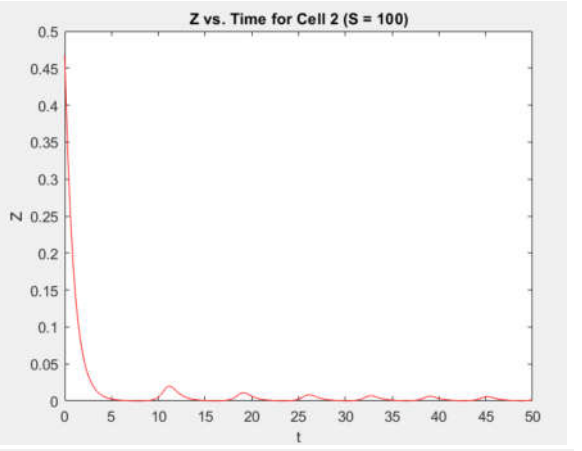
cell 2 ⇒ X = -0.003525, Y = 0.017125, Z = 0.46725

cell 3 ⇒ X = -0.005875, Y = 0.010275, Z = 0.28035

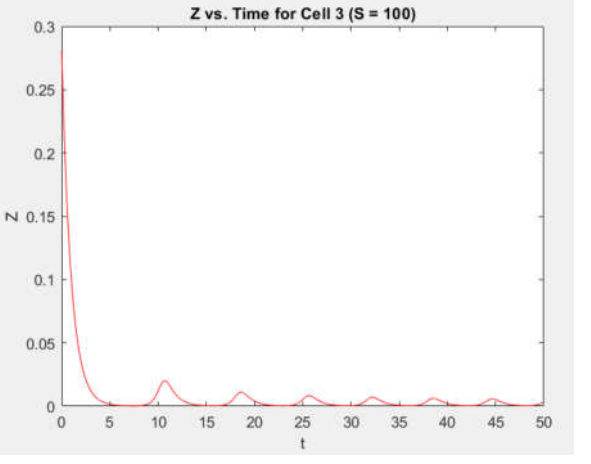
Used same code that was used for part d, just changed S value and Initial Conditions.

AC-DC circuit, S = 100





Plots of Z vs. t for cells 1-3



Incoherent oscillations

$S = 105$

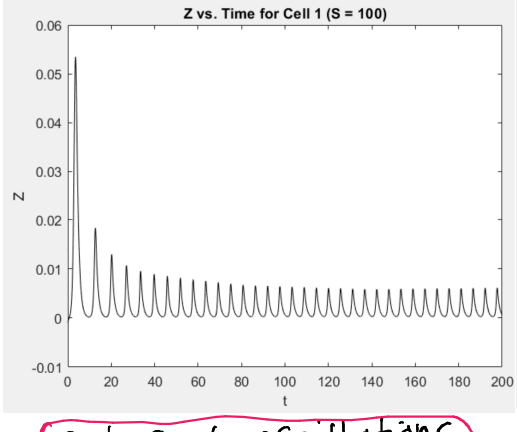
steady state $\Rightarrow X = 0.0273,\ Y = 0.4087,\ Z = -8.622 \times 10^{-4}$

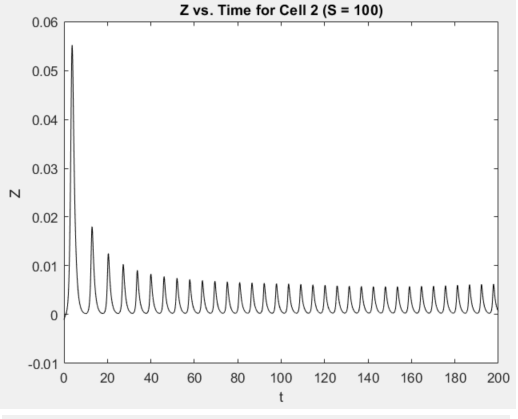
Initial conditions for Z vs. t Plots $S = 105 \rightarrow 100$

cell 1 $\Rightarrow X = 0.0273,\ Y = 0.4087,\ Z = -8.622 \times 10^{-4}$

cell 2 $\Rightarrow X = 0.034125,\ Y = 0.510875,\ Z = -0.001027$

cell 3 $\Rightarrow X = 0.020475,\ Y = 0.306525,\ Z = -6.17 \times 10^{-4}$

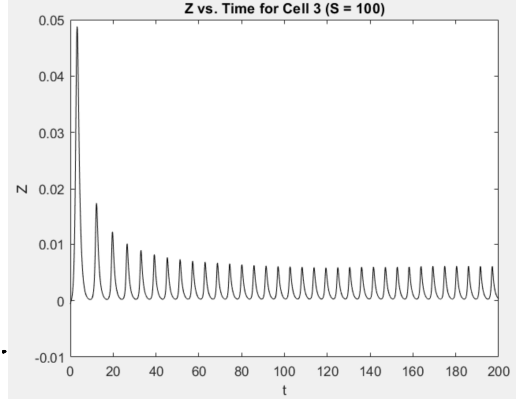




Coherent oscillations

oscillations not damped, pass through saddle node bifurcation $S = 105 \rightarrow 100$

By $t \simeq 30$, amplitude of oscillations stays the same.



f) yes because I changed signal $S=105$ to $S=100$ in part e and the resulting oscillations were coherent.

(I used the parameters from Table S.1 in my matlab code.)

So, therefore it is possible because I created plots of z vs. t for this change in S for part e