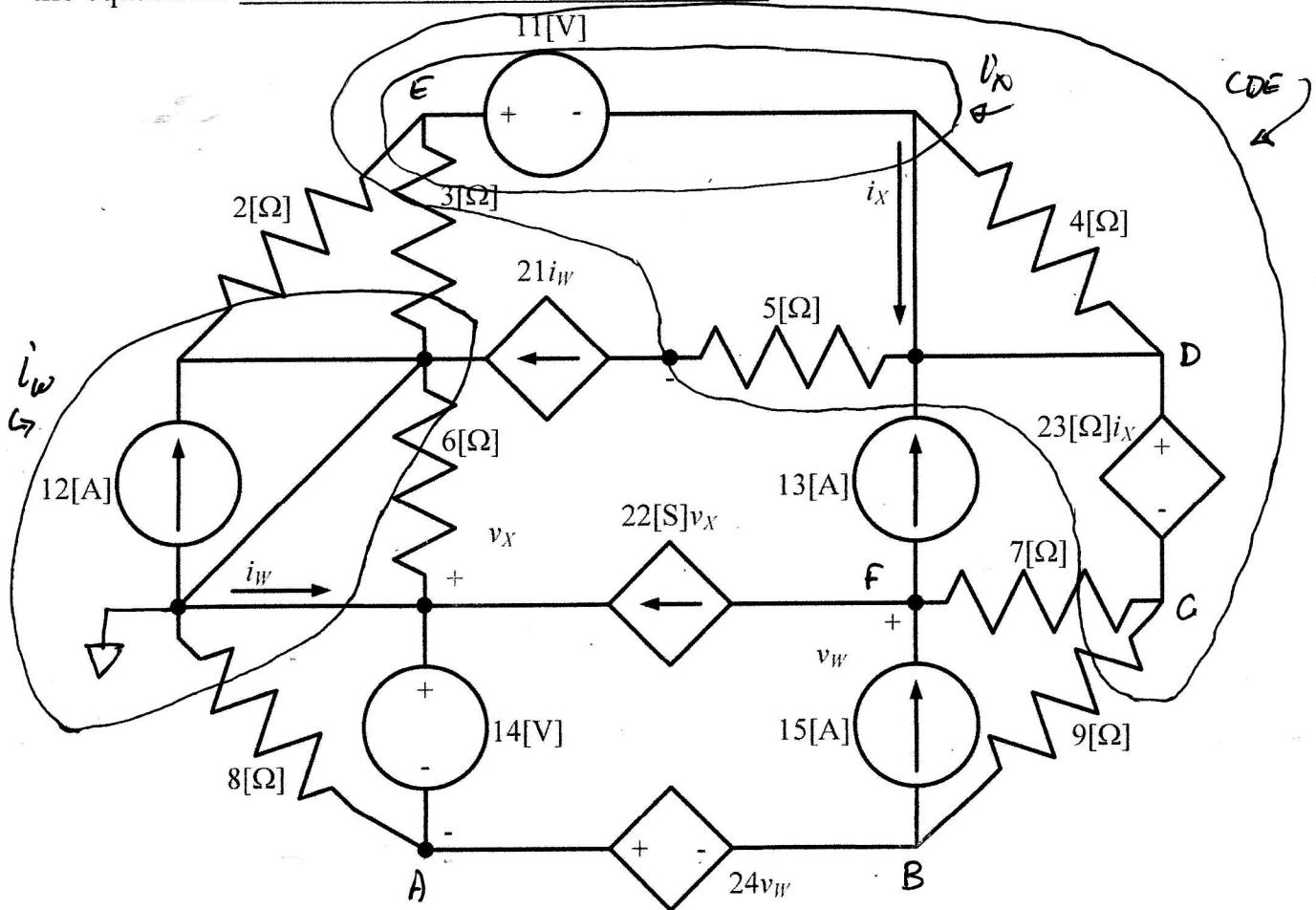Use the node voltage method to write a complete set of equations that could be used to solve the circuit below. Do not simplify the circuit. Do not attempt to solve the equations. <u>You must define all circuit variables.</u>

A: $v_A = -14 [v]$

C,D,E:

$\dfrac{v_c - v_B}{9} + \dfrac{v_c - v_F}{7} - 13[A] + 21 i_w + \dfrac{v_E}{3} + \dfrac{v_E}{2} = 0$

B: $v_B = -24 \cdot v_w - 14$

$v_c - v_D = -23 [\Omega] i_x$ $\qquad v_D - v_E = -11 [v]$

F: $\dfrac{v_F - v_c}{7} + 13[A] - 15[A] + 22[S] v_x = 0$

$i_x :$

$i_x + \dfrac{v_E}{3} + \dfrac{v_E}{2} = 0$

$v_x : \quad v_x - 5(21 i_w) + v_D = 0$

$i_w :$

$i_w - 21 i_w - \dfrac{v_E}{3} - \dfrac{v_E}{2} - \dfrac{v_A}{8} = 0$

$v_w : \quad -v_w + v_F + 14 [v]$