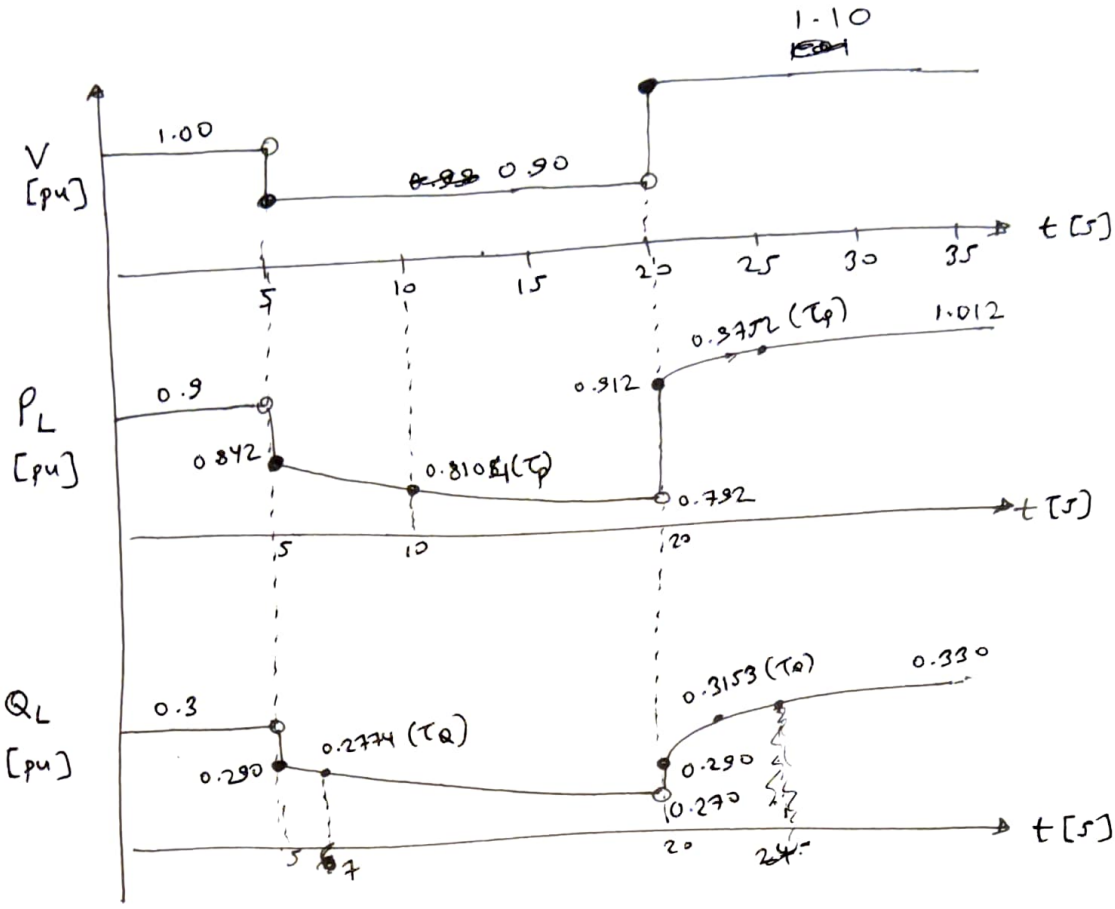
2.



$$P_L(t) = P_{L0} + MV + GV^2 + P_{LD}(t)$$

where $P_{LD}(s) = \dfrac{a_{op}}{1 + b_{op} s}$

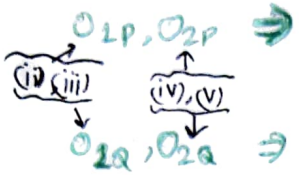
$$Q_L(t) = Q_{L0} + HV + BV^2 + Q_{LD}(t)$$

where $Q_{LD}(s) = \dfrac{a_{oq}}{1 + b_{oq} s}$

	t	$V(t)$	$P_L(t)$	$Q_L(t)$	$P_L(t)$	$Q_L(t)$
(i)	5^-	1.00	0.900	0.300	$P_{L0} + M + G + a_{op}$	$Q_{L0} + H + B + a_{oq}$
(ii)	5^+	0.90	0.842	0.290	$P_{L0} + 0.9M + 0.81G + a_{op}$	$Q_{L0} + 0.9H + 0.81B + a_{oq}$
τ_{1P}	$5 + \tau_P = 7.5$	0.90	0.8105	–	$b_{op} = 4.5$	–
τ_{1Q}	$5 + \tau_Q = 7$	0.90	–	0.2774	–	$b_{oq} = 2$
(iii)	20^-	0.90	0.792	0.270	$P_{L0} + 0.9M + 0.81G + 0.9a_{op}$	$Q_{L0} + 0.9H + 0.81B + 0.9a_{oq}$
(iv)	20^+	1.10	0.912	0.290	$P_{L0} + 1.1M + 1.21G + 0.9a_{op}$	$Q_{L0} + 1.1H + 1.21B + 0.9a_{oq}$
τ_{2P}	$20 + \tau_P = 24.5$	1.10	0.9752	–	$b_{op} = 4.5$	–
τ_{2Q}	$20 + \tau_Q = 22$	1.10	–	0.3153	–	$b_{oq} = 2$
(v)	∞	1.10	1.012	0.330	$P_{L0} + 1.1M + 1.21G + 1.1a_{op}$	$Q_{L0} + 1.1H + 1.21G + 1.1a_{oq}$

(iii) − (ii) ⇒ $0.1\,a_{0P} = 0.05$ $\quad 0.1\,a_{0Q} = 0.02$

⇒ $\boxed{a_{0P} = 0.5}$ ⇒ $\boxed{a_{0Q} = 0.2}$ (vi)



⇒ $\boxed{b_{0P} = 4.5}$

$\boxed{b_{0Q} = 2}$

(i) (ii) (iii) (iv) and (vi) ⇒ $\boxed{P_{L0} = 0}$, $\boxed{M = 0.2}$, $\boxed{G = 0.2}$ $\quad \boxed{Q_{L0} = 0}$, $\boxed{H = 0.1}$, $\boxed{B = 0}$

Thus

$$P_L(t) = 0.2V + 0.2V^2 + P_D(t)$$

where $P_{LD}(s) = \dfrac{0.5}{1 + s4.5}$

$$Q_L(t) = 0.1V^2 + Q_D(t)$$

where $Q_{LD}(s) = \dfrac{0.2}{1 + s2}$

Any