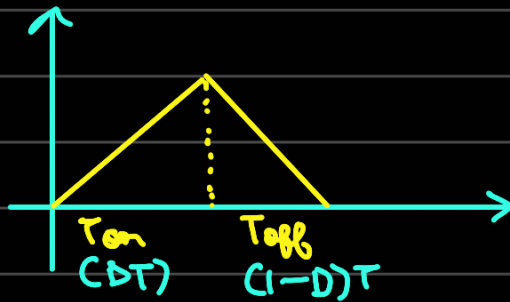
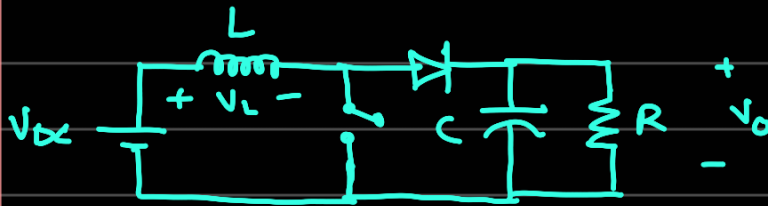


Day-14



$$\text{slope } (T_{on}) = \frac{I(DT) - I(0)}{DT} = \frac{V_{in}}{L}$$

$$\text{slope } (T_{off}) = \frac{I(0) - I(DT)}{(1-D)T} = -\frac{V_{in} - V_o}{L}$$

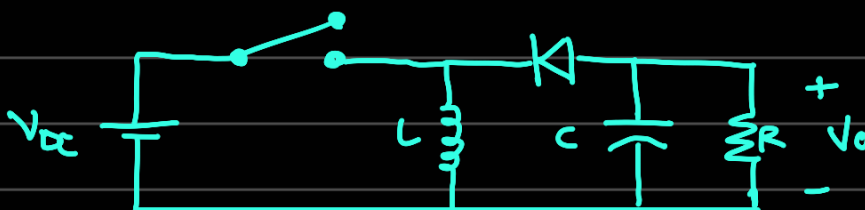
$$\text{So } \frac{V_{in}}{L} DT = -\frac{V_{in} - V_o}{L} (1-D)T$$

$$\Rightarrow \frac{V_o}{V_{in}} = \frac{1}{1-D}$$

Derive: $I_L(0) = I_{Lmin} = V_{in} \left[\frac{1}{R(1-D)^2} - \frac{DT}{2L} \right]$

$$I_{Lmax} = V_{in} \left[\frac{1}{R(1-D)^2} + \frac{DT}{2L} \right]$$

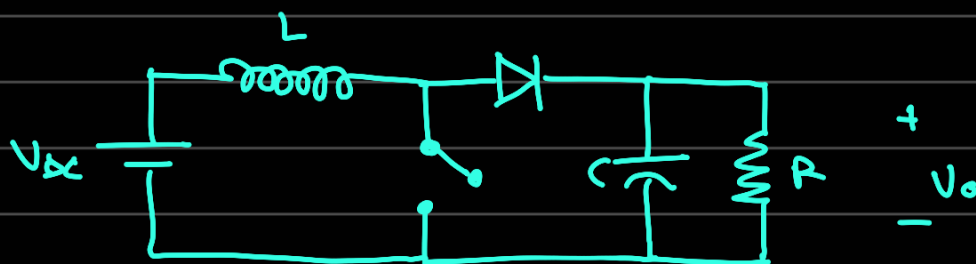
→ Buck-Boost Converter —



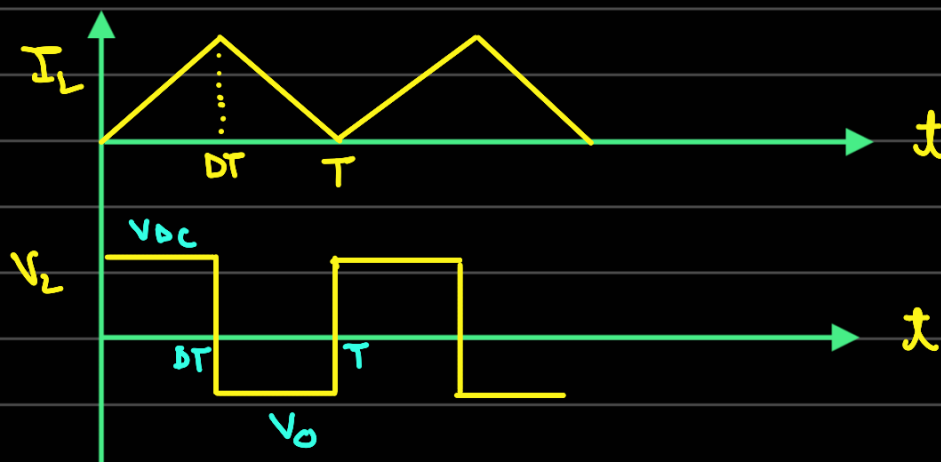
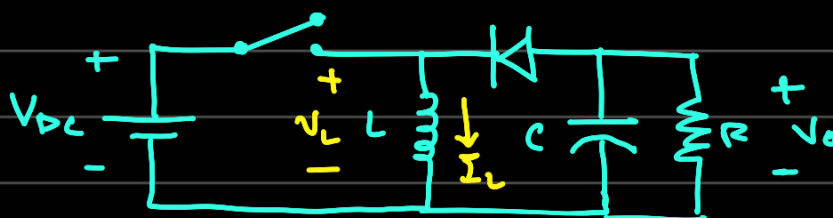
Buck :



Boost :



Buck-Boost :



$$\langle V_L \rangle = 0$$

$$\Rightarrow V_{dc} DT = -V_o (1-D) T$$

$$\Rightarrow \frac{V_o}{V_{dc}} = \frac{-D}{1-D}$$