

2nd Series of Exercises :

DC/DC Converters (Rectifiers)

Exercise 1:

An ideal chopper shown in Figure 1, operates at a frequency of 500 Hz, powers a load of resistance $R=3\Omega$ and inductance of 9mH using a battery of 60V.

- 1- Determine the waveforms of the load current (I_L) for a duty cycles of 0.5, 0.25, and 0.75.
- 2- Calculate the average voltage ($V_{L_{AVG}}$) and average current ($I_{L_{AVG}}$) of the load for each duty cycles.
- 3- Calculate the maximum and minimum values of the charging current.

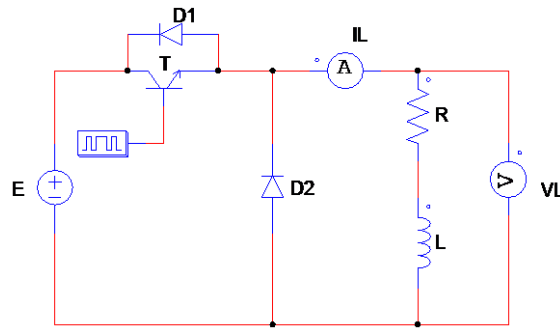


Figure 1

Exercise 2 :

A chopper shown in Figure 2, the transistor is closed for αT of the period T . Neglecting the resistance r , calculate the average values of U_c , U , i_R , i and i_D

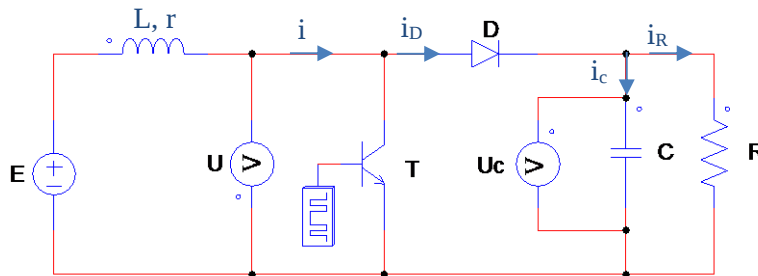


Figure 2