



# *Unit 1 –*

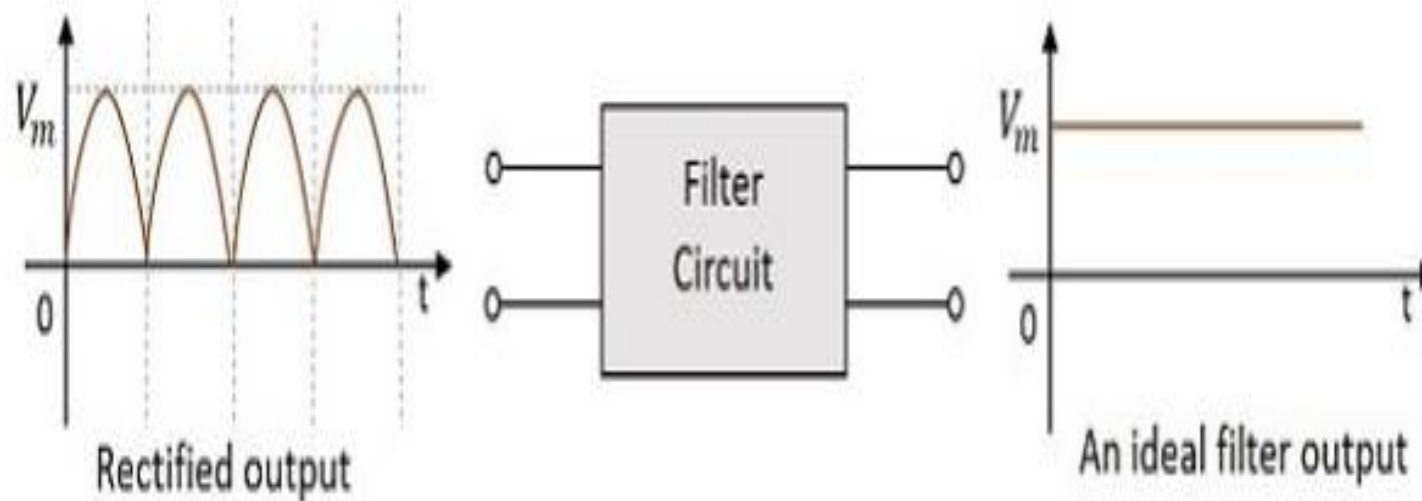
# **SEMICONDUCTOR DIODES**

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*Dr. AIT*

## *Class 5*

## Filter Circuit

Filter Circuit – The devices that converts pulsating dc components to steady dc voltage





Dr. Ambedkar Institute of Technology



## Filter Circuit

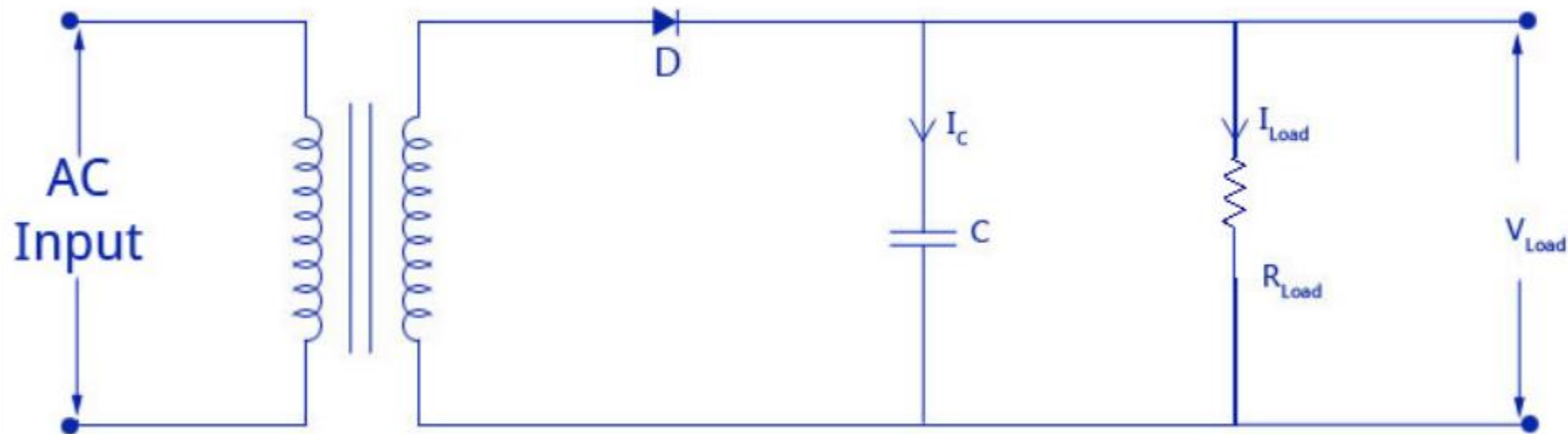
### Filter Circuit :

a) Capacitor : A capacitor allows ac and block dc

a) Inductor : An inductor allows dc and blocks ac

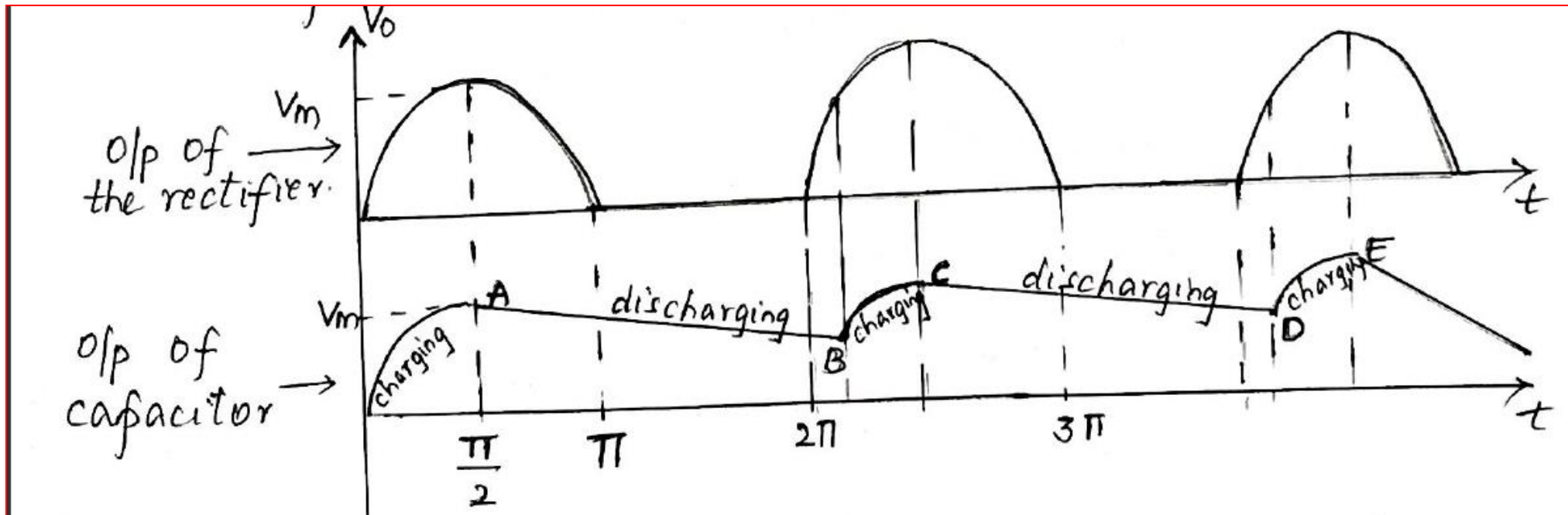
# Half-wave Rectifier with Capacitor Filter

## Half wave Rectifier with Capacitor Filter

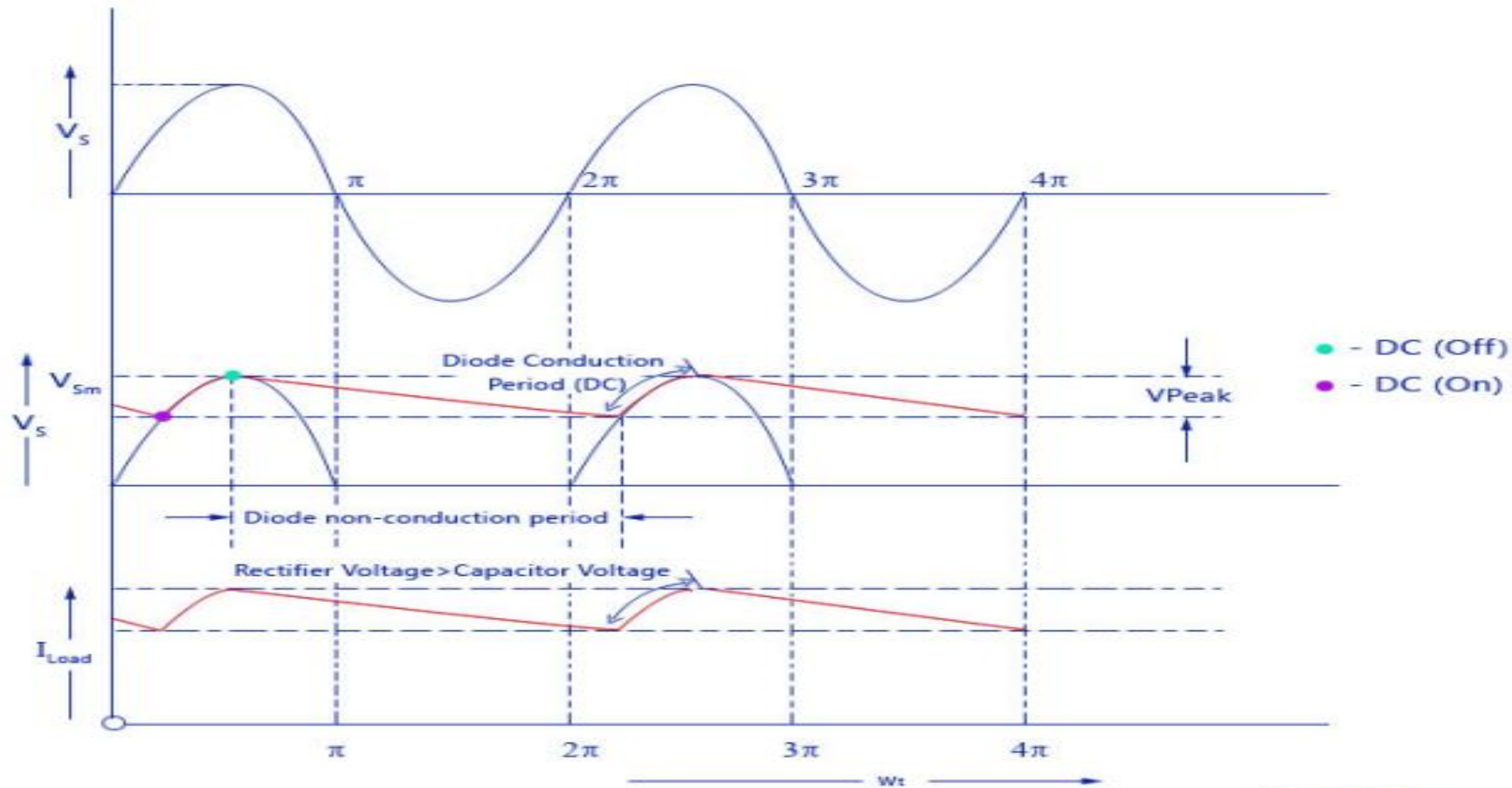


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# Half-wave Rectifier with Capacitor Filter



# Half-wave Rectifier with Capacitor Filter



## Half-wave Rectifier with Capacitor Filter

The ripple factor for half-wave rectifier with capacitor filter

$$\gamma = \frac{1}{2\sqrt{3} f C R_L}$$

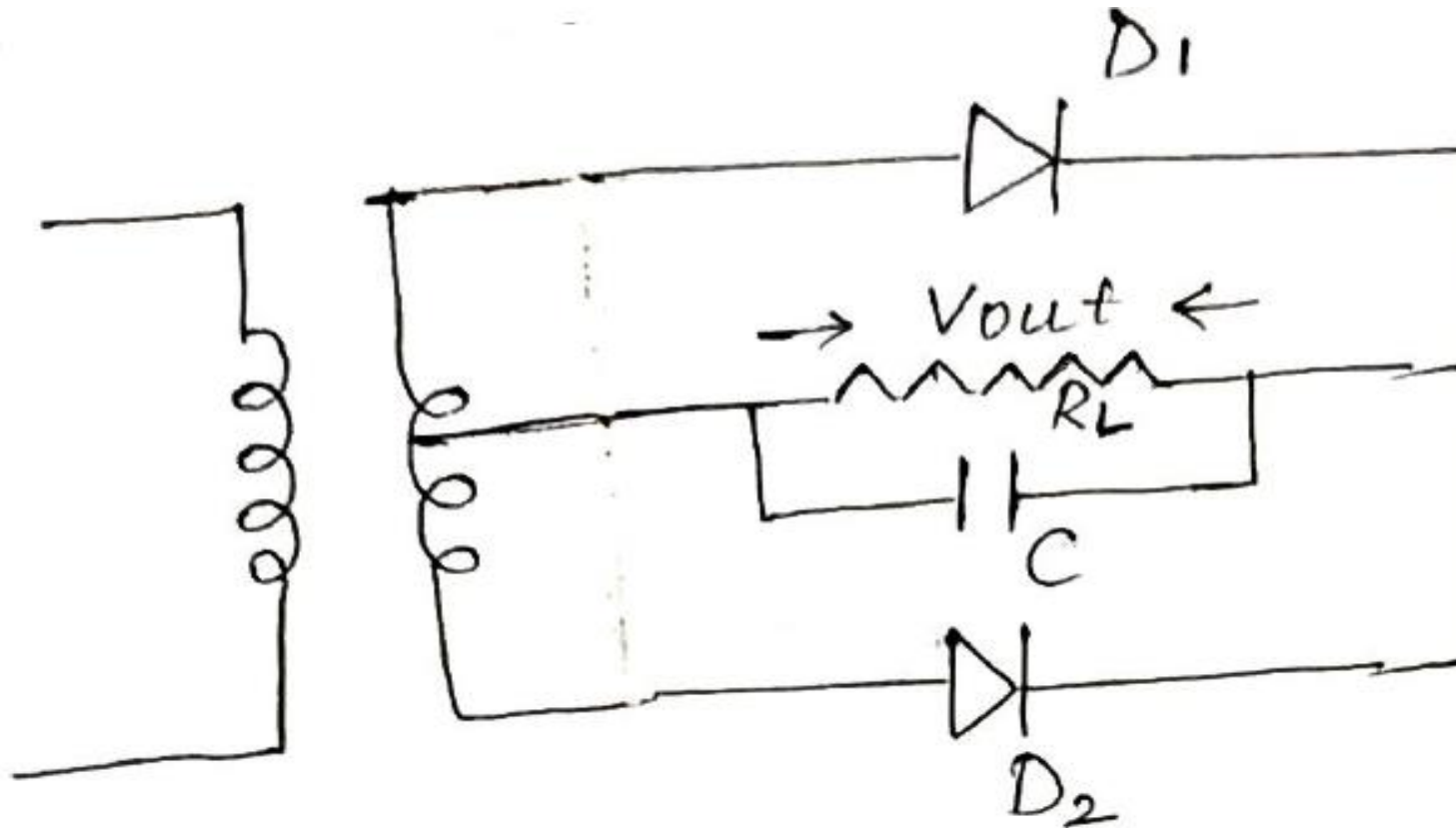
$$R_L \times C = \text{Time constant}$$

$$R \rightarrow \Omega$$

$$C \rightarrow \text{Farads}$$

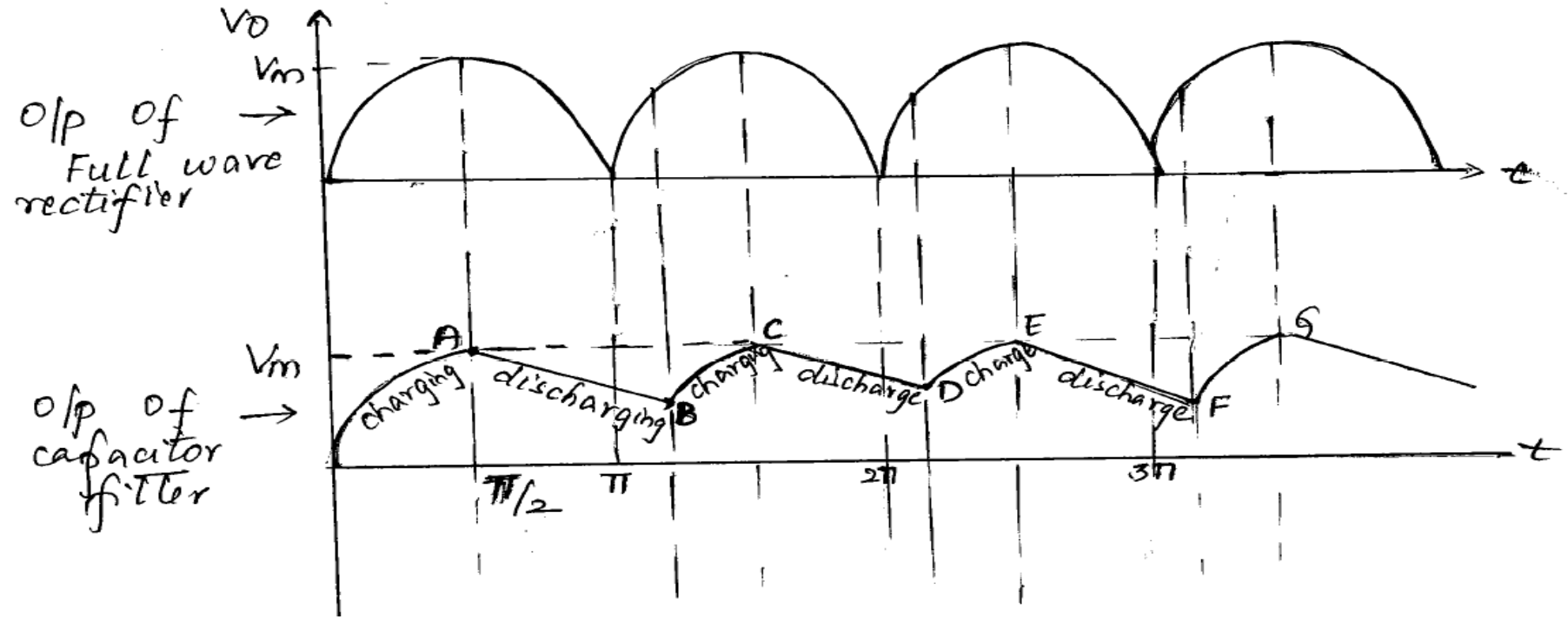
$$f \rightarrow \text{line frequency (Hz)}$$

# Full -wave Rectifier with Capacitor Filter



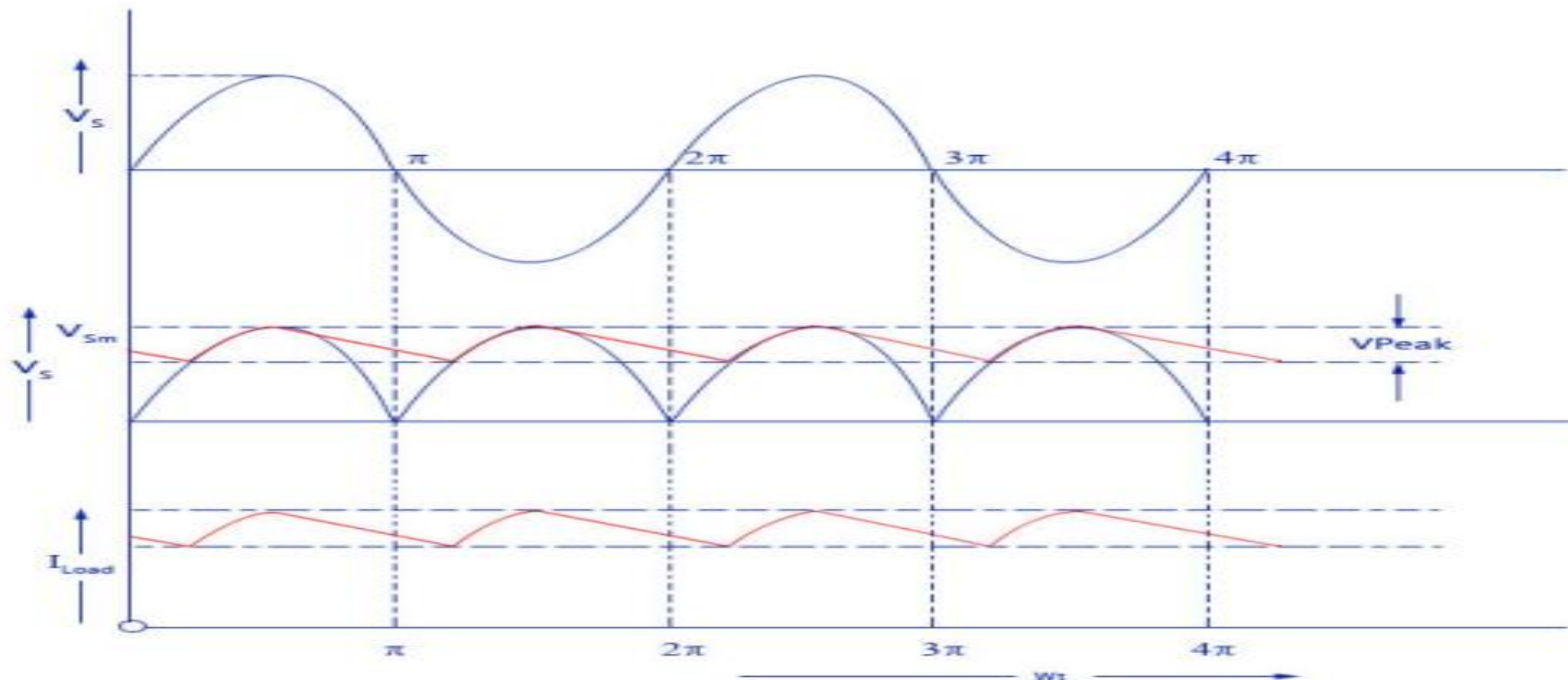


# Full -wave Rectifier with Capacitor Filter



# Full -wave Rectifier with Capacitor Filter

Fullwave Rectifier with Capacitor Filter - Waveform



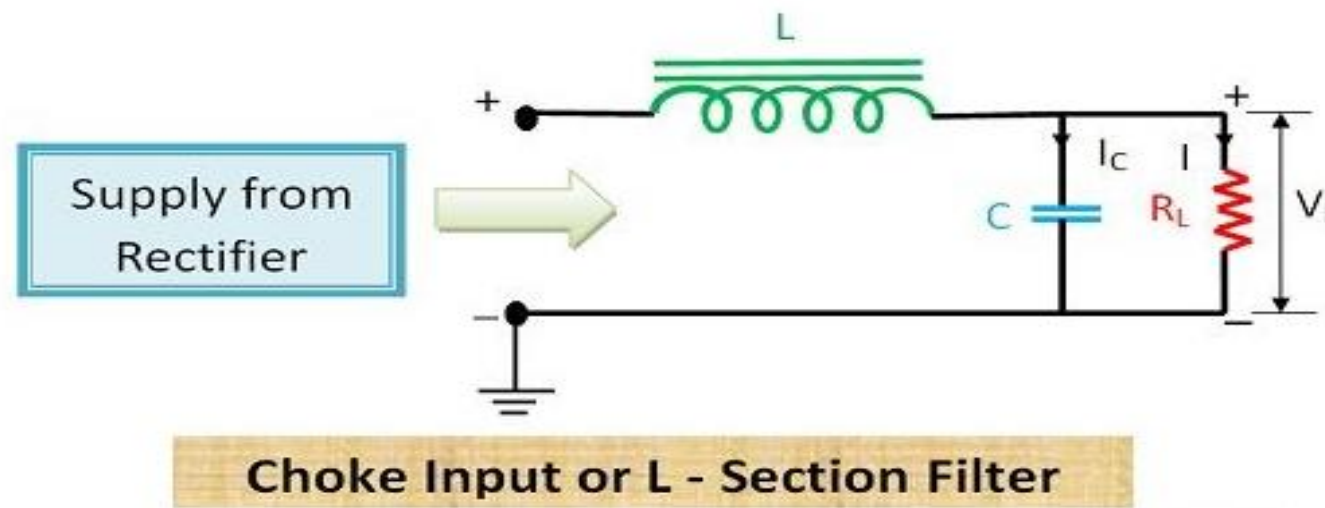
# Full -wave Rectifier with Capacitor Filter

The ripple factor for full wave  
rectifier with capacitor filter

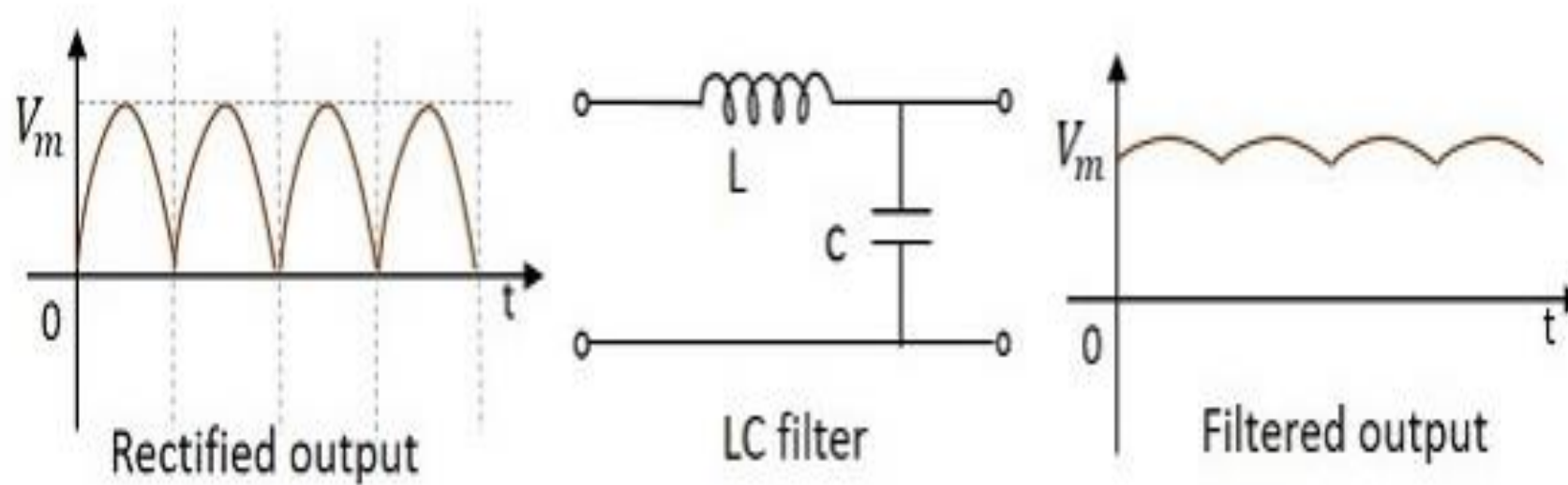
$$r = \frac{1}{4\sqrt{3} f C R L}$$

## L-C Filter

**Choke Filter**– Choke filter consists of an inductor connected in series with rectifier output circuit and a capacitor connected in parallel with the load resistor. It is also called **L-section filter** because the inductor and capacitor are connected in the shape of inverted L.



## L-C Filter





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*Thank You*

*HAVE A NICE DAY*