

$$b_n = \frac{4V_{dc}}{n\pi^2} \sinh(n\omega t)$$

$$V_{R1} = \frac{4V_{dc}}{2\pi} \sin \omega t$$

$$V_{Y1} = \frac{4V_{dc}}{2\pi} \sin(\omega t - 120^\circ)$$

$$V_{B1} = \frac{4V_{dc}}{\pi^2} \sin(\omega t + 120^\circ)$$

$$V_{R3} = \frac{4 V_{dc}}{3\pi^2} \sin 3(\omega t)$$

$$V_{Y3} = \frac{4 V_{dc}}{3\pi^2} \sin 3(\omega t - 120^\circ)$$

$\sin 3\omega t$

$$V_{B3} = \frac{4 V_{dc}}{3\pi^2} \sin 3(\omega t + 120^\circ)$$

$\sin 3\omega t$


$$V_{R5} = \frac{4 V_{dc}}{5\pi^2} \sin 5\omega t$$

$$V_{Y5} = \frac{4 V_{dc}}{5\pi^2} \sin 5(\omega t - 120^\circ)$$

$$V_{B5} = \frac{4 V_{dc}}{5\pi^2} \sin 5(\omega t + 120^\circ)$$

$$V_{Y5} \rightarrow \sin 5(\omega t - 120^\circ) = \sin(5\omega t - 60^\circ)$$

$= \sin(5\omega t + 120^\circ)$



$$V_{B5} \rightarrow \sin 5(\omega t + 120^\circ) = \sin(5\omega t - 120^\circ)$$

$R_5 - B_5 - Y_3$

$$V_{R7} \rightarrow \frac{4 V_{dc}}{7\pi^2} \sin 7\omega t$$

$$V_{Y7} \rightarrow \frac{4 V_{dc}}{7\pi^2} \sin 7(\omega t - 120^\circ)$$

$\sin(7\omega t - 840^\circ) \rightarrow \sin(\omega t - 120^\circ)$

$$V_{B1} = \frac{4V_{dc}}{7\pi^2} \sin 7(\omega t + 120^\circ)$$

$$= \frac{4V_{dc}}{7\pi^2} \sin(\omega t + 120^\circ)$$

7th harmonic \rightarrow R-Y-B

$$V_{RY1} \Rightarrow \frac{2}{\pi} \int_0^T f(t) \sin n\omega t dt$$

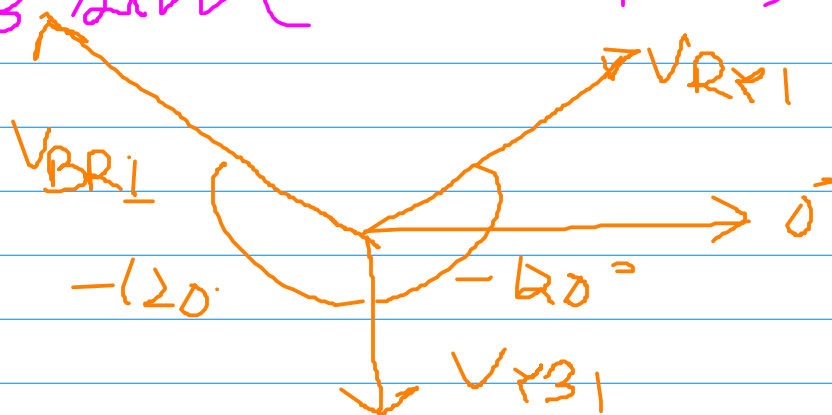
$$\frac{2V_{dc}}{\pi} \int_{30^\circ}^{90^\circ} \sin \theta d\theta = \frac{4V_{dc}}{\pi} \left[-\cos \theta \right]_{30^\circ}^{90^\circ}$$

$$= \frac{4V_{dc}\sqrt{3}}{2\pi} \sin(\omega t + 30^\circ)$$

$$V_{B1} = \frac{4V_{dc}\sqrt{3}}{2\pi} \sin(\omega t + 30^\circ - 120^\circ)$$

$$V_{BR1} = \frac{4V_{dc}\sqrt{3}}{2\pi} \sin(\omega t + 30^\circ + 120^\circ)$$

R-Y-B



$$V_{RY3} \rightarrow \sin 3(\omega t + 30^\circ)$$

$$V_{Y33} \rightarrow \sin 3(\omega t - 90^\circ)$$

$$V_{BR3} \rightarrow \sin 3(\omega t + 150^\circ)$$

$$\frac{2}{2\pi} \times 4 \int_{30^\circ}^{90^\circ} \sin 3\theta d\theta = 0$$

$$5th \quad V_{RY5} \quad \frac{2}{2\pi} \frac{4}{5} \int_{30^\circ}^{90^\circ} \sin 5\theta d\theta \rightarrow -\frac{\sqrt{3}}{2}$$

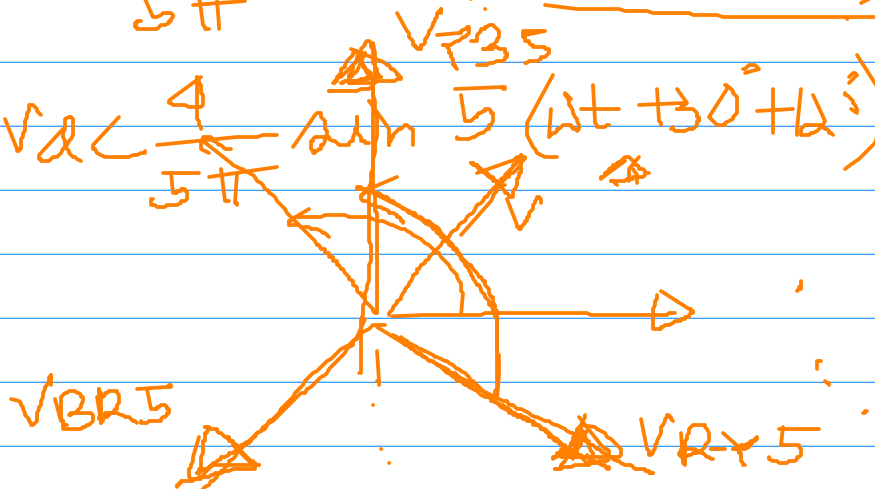
$$V_{RY7} \rightarrow -\frac{\sqrt{3}}{2}$$

$$V_{RY5} \rightarrow -\frac{\sqrt{3}}{2} V_{LL} \frac{4}{5\pi} \sin 5(\omega t + 30^\circ)$$

$$V_{Y35} \rightarrow \left(-\frac{\sqrt{3}}{2}\right) V_{LL} \frac{4}{5\pi} \sin 5(\omega t + 30^\circ + 120^\circ)$$

$$V_{BR5} \rightarrow -\frac{\sqrt{3}}{2} V_{LL} \frac{4}{5\pi} \sin 5(\omega t + 30^\circ + 240^\circ)$$

$R_5 - B_5 - Y_5$



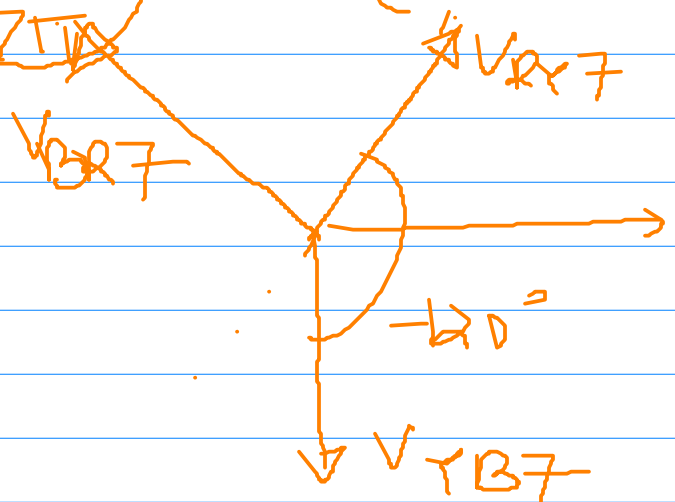
$$7th \rightarrow -\frac{\sqrt{3}}{2}$$

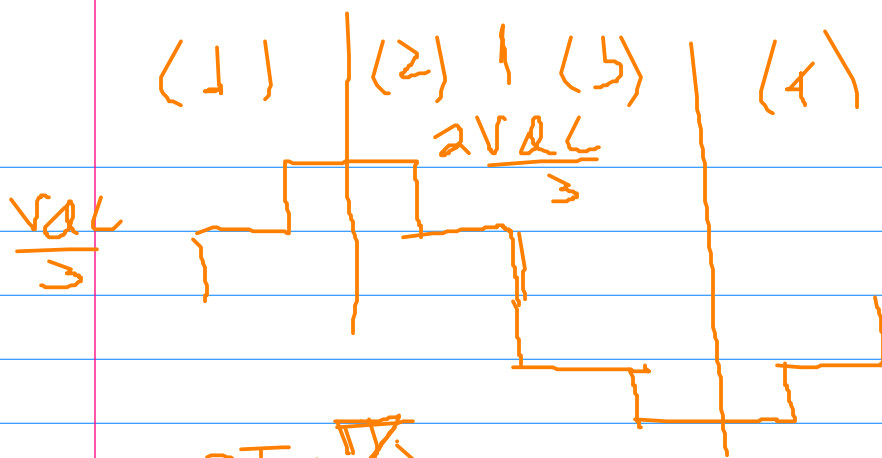
$$V_{RY7} = -\frac{\sqrt{3}}{2} \frac{4V_{dc}}{7\pi} \sin 7(\omega t + 30^\circ)$$

$$V_{YB7} = -\frac{\sqrt{3}}{2} \frac{4V_{dc}}{7\pi} \sin 7(\omega t + 30^\circ - 120^\circ)$$

$$V_{BR7} = -\frac{\sqrt{3}}{2} \frac{4V_{dc}}{7\pi} \sin 7(\omega t + 30^\circ + 120^\circ)$$

R-Y-B





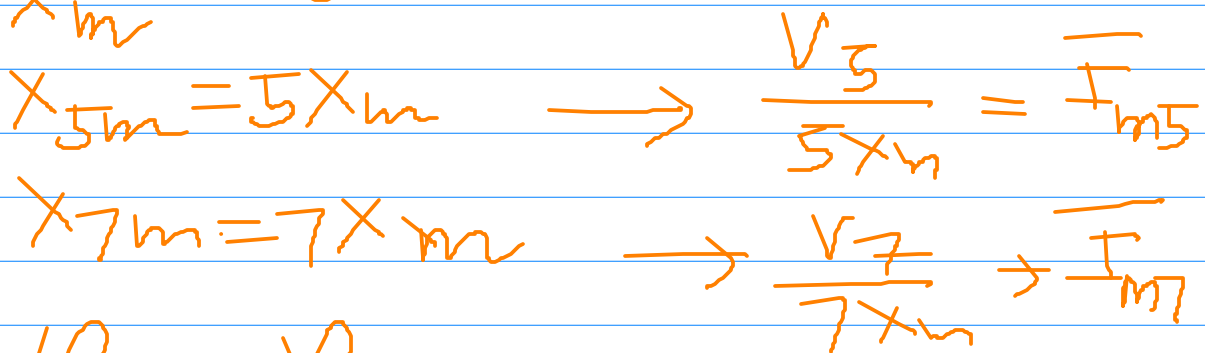
$$\begin{aligned}
 & \frac{V_{dc} \cdot 2}{2\pi} \times 4 \left[\int_0^{\pi/3} \frac{1}{3} \sin \theta d\theta + \int_{\pi/3}^{2\pi/3} \frac{2}{3} \sin \theta d\theta \right] \\
 &= \frac{2}{2\pi} \times 4 \left[\frac{1}{3} \times 5 + \frac{2}{3} \times 5 \right] \\
 &= \frac{2 \times 4 V_{dc}}{2\pi} = \frac{4V_{dc}}{2\pi} = b_1 = V_{Rms} \\
 & V_{Rms} = \frac{4V_{dc}}{2\pi} \sin \omega t
 \end{aligned}$$

$$V_{Rms} = 0$$

$$V_{Rms} = \frac{4V_{dc}}{2 \times 5\pi} \sin 5\omega t \quad V = N \frac{d\phi}{dt}$$

$$V_{Rms} = \frac{4V_{dc}}{2 \times 7\pi} \sin 7\omega t$$

$$\begin{aligned}
 T_{Total} &= (\phi_1, NI_1, L\phi_1, NI_1) \\
 &+ (\phi_5, NI_1, L\phi_5, NI_1) \leftarrow \delta_1 \\
 &+ (\phi_1, NI_5, L\phi_1, NI_5) \leftarrow \delta_2
 \end{aligned}$$



pulsating tumor