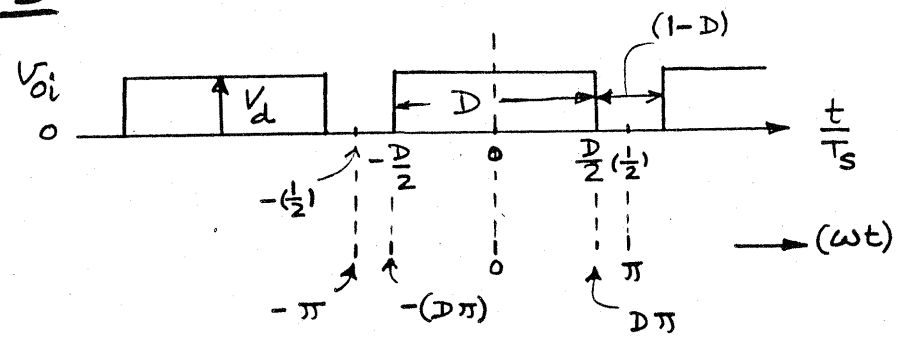
Problem 1-3



With the choice of origin as above, V_{oi} waveform has even symmetry.

$$\therefore\ b_h = 0 \quad \text{and} \quad a_h = \frac{2}{\pi}\int_0^{\pi} V_{oi}(t)\cos(h\omega t)\, d(\omega t)$$

$h = 0$ to ∞

$$\therefore\ a_h = \frac{2V_d}{\pi}\int_0^{D\pi} \cos(h\omega t)\cdot d(\omega t) = \frac{2V_d}{h\pi}\sin(Dh\pi) \qquad h = 1 \to \infty$$

$$\left(V_{oi}\right)_{\text{average}} = \frac{1}{2}a_0 = \frac{1}{\pi}\int_0^{D\pi} V_d \cdot d(\omega t) = DV_d \quad \text{(average value)}$$

$$= 15\ V \quad \text{at} \quad D = 0.75$$

h	$(\hat{V}_{oi})_h$ ← peak value
1	9.0 V
2	6.37 V
3	3.0 V
4	0.0
5	1.8 V
⋮	