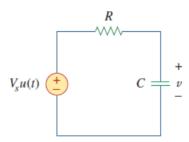
PROGRAM STEP RESPONSE RANGKAIAN RC Syarifatul Lathifah (18318016)

A. PENURUNAN RUMUS



Gambar 1. Rangkaian RC

Dengan analisis rangkaian didapatkan $\frac{dv}{dt} + \frac{v(t)}{RC} - \frac{Vs}{RC} = 0$ Diketahui bahwa $\frac{dv}{dt} = \lim_{t \to \infty} \frac{\Delta v}{\Delta t} = \frac{v(t) - v(t - \Delta t)}{\Delta t}$ Sehingga $\frac{v(t) - v(t - \Delta t)}{\Delta t} + \frac{v(t)}{RC} - \frac{Vs}{RC} = 0$ Misalkan, $a = \frac{1}{RC} dan b = \frac{Vs}{RC}$

Sehingga $\frac{v(t)-v(t-\Delta t)}{\Delta t} + av(t) - b = 0$

Kali kedua ruas dengan Δt $v(t) - v(t - \Delta t) + av(t)\Delta t - b\Delta t = 0$

Kelompokkan variable v(t) $v(t)(1+a\Delta t)=v(t-\Delta t)+b\Delta t$

Sehingga, $v(t) = \frac{v(t-\Delta t) + b\Delta t}{(1+a\Delta t)} \quad \text{untuk } t > 0$

Sedangkan ketika $t \le 0$ maka v(t) = 0

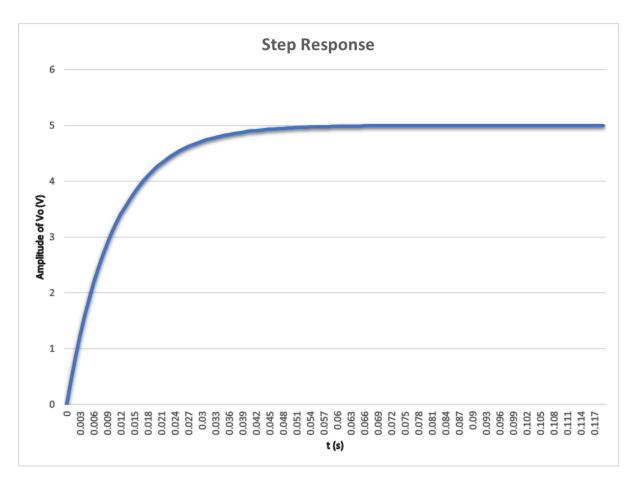
B. FLOWCHART

STEP RESPONSE PROGRAM Syarifatul Lathifah (18318016) >> FUNCTION vo (t) >> MAIN PROGRAM vo (float t) start FILE *filestep float r = 10000, dt = 0.001, c = 0.000001, vs = 5, a = 1/(r*c), b = vs/(r*c) filestep = fopen("stepresponse.csv","w") t <= 0 float r = 10000, dt = 0.001, c = 0.000001, z, tmax = 12*r*c, YES NO vout = (vo(t-dt) + b*dt)/(1+(a*dt))vout = 0t <= tmax NO YES return (vout) fclose(filestep) z = vo(t)fprintf(filestep, "%.3f;%.3f\n", t, z) t = t + dt

Gambar 2. Flowchart program step response rangkaian RC

end

C. GRAFIK



Gambar 3. Grafik step response rangkaian RC