

1712NG1031047

SANI AHMAD DAHURI

ENIG1281

ASSIGNMENT 3

The dynamic model of the voltage applied to a capacitor with $C = 0.01 \text{ F}$ is given as in equation (1)

$$v(t) = 110 \cos(120\pi t)$$

With the aid of MATLAB mfile, plot the dynamic responses of the voltage (v) in volt, the current (i) through the capacitor in Amperes and the power (p) in watt for time t from 0 to 0.35 sec with a step size of 0.01 sec on the graph. The labels of the y and the x axis of the graph should be variable and time (sec) respectively, and the graph should have both major and minor grid lines. Also, the legends of the plots should be voltage, current (i) and power (w). The colour of the line of the voltage, the current and the power should be blue, red and black respectively.

Soln

- 1) Command window
- 2) clear
- 3) clc
- 4) close all
- 5) Syms t
- 6) $U = 110 * \cos(120 * \pi * t)$
- 7) $I = \text{diff}(U)$
- 8) $P = I * U$
- 9) $t = 0:0.001:0.35$
- 10) $Un = \text{subs}(U)$
- 11) $Iun = \text{double}(Un)$
- 12) $In = \text{subs}(I)$
- 13) $Iun = \text{double}(In)$
- 14) $Pn = \text{subs}(P)$
- 15) $Pun = \text{double}(Pn)$
- 16) $\text{plot} = ('t', 'Un', 'P')$

1-#12101031

17) hold on

18) plot ('t', 'lnn', 'b')

19) legend ('voltage (v)', 'current (A)', 'power (w)')

20) grid on

21) grid minor

22) x label ('Time (s)')

23) y label = (variable)