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function buckpostproc

L = 57.024e-6; %Inductor
C = 473e-6; %Capacitor
R = 1.152/10; % Rload - HEAVY
D = 1/10; % Duty Cycle

k = 0;

i = 1;
delta_t = (1/10000)/100; %Delta T

initial_I = 0; % Initial Inductor Voltage
initial_V = 0; % Initial Capacitor Voltage
tend = 20*1/10000; %Number of cycles to plot for

[iL, Vload] = buck(L, C, R, delta_t, initial_I, initial_V, tend); %Returns IL and Vload for circuit

while(k(i) < tend)
    sw(i+1) = switching(D, k(i));
    id(i+1) = (1 - sw(i+1)).*iL(i+1);
    isw(i+1) = sw(i+1).*iL(i+1);
    k(i+1) = k(i) + (delta_t);
    i = i + 1;
end

% iL_av = avrg(iL, delta_t*100, delta_t);
% ic = iL - iL_av;
% Pout = (iL - ic) .* Vload;
% Pout_av = avrg(Pout, delta_t*100, delta_t);
%
% Pin = 480*isw;
% Pin_av = avrg(Pin, delta_t*100, delta_t);
% efficency = Pout_av / Pin_av; %%Efficiency = 1.01

%%% Question 1 Part C, Part III Code for HEAVY Load

figure(1)
title("Question C, Part III")
subplot(4,1,1);
hold on
plot(k, Vload, 'b');
ylabel("Output Voltage (V)"); % Y-Label for the graph

subplot(4,1,2);
plot(k, iL, 'r');
ylabel("Current (A)"); % Y-Label for the graph

subplot(4,1,3);
plot(k, isw, 'b');
ylabel("Current (A)"); % Y-Label for the graph

subplot(4,1,4);
plot(k, id, 'c');
ylabel("Current (A)"); % Y-Label for the graph
xlabel("Time (s)"); % X-Label for the graph

grid on

%%% Question 1 Part C, Part IV Code for Light Load

figure(1)
title("Question C, Part IV")
subplot(4,1,1);
hold on
plot(k, Vload, 'b');
ylabel("Output Voltage (V)"); % Y-Label for the graph

subplot(4,1,2);
plot(k, iL, 'r');
ylabel("Current (A)"); % Y-Label for the graph

subplot(4,1,3);
plot(k, isw, 'b');
ylabel("Current (A)"); % Y-Label for the graph

subplot(4,1,4);
plot(k, id, 'c');
ylabel("Current (A)"); % Y-Label for the graph
xlabel("Time (s)"); % X-Label for the graph

grid on

end

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