```
clear all;
clc;

%%%%%%%%%%%%%%
% Parameters %
%%%%%%%%%%%%%%

F = [0 .5 1 1.5]; % values for F
m = 1;
omega0 = 1;
beta = 0.2;
omega = sqrt(omega0^2 - beta^2);

t = [0:.01:20];

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% initial conditions x(0) = 1 and v(0) = 0 %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

delta = atan(beta/omega);
for q = 1:size(F,2)
    A(q) = (1- F(q)/m/omega0^2)*sqrt(beta^2+omega^2)/omega;
end

%%%%%%%%%%%%%
% Equations %
%%%%%%%%%%%%%

for n=1:size(t,2)
    for q=1:size(F,2)
        x(n,q) = F(q)/m/omega0^2 + A(q)*exp(-beta*t(n))*cos(omega*t(n)-delta);
    end
end

plot(t,x(:,1),t,x(:,2),t,x(:,3),t,x(:,4))
grid on
```