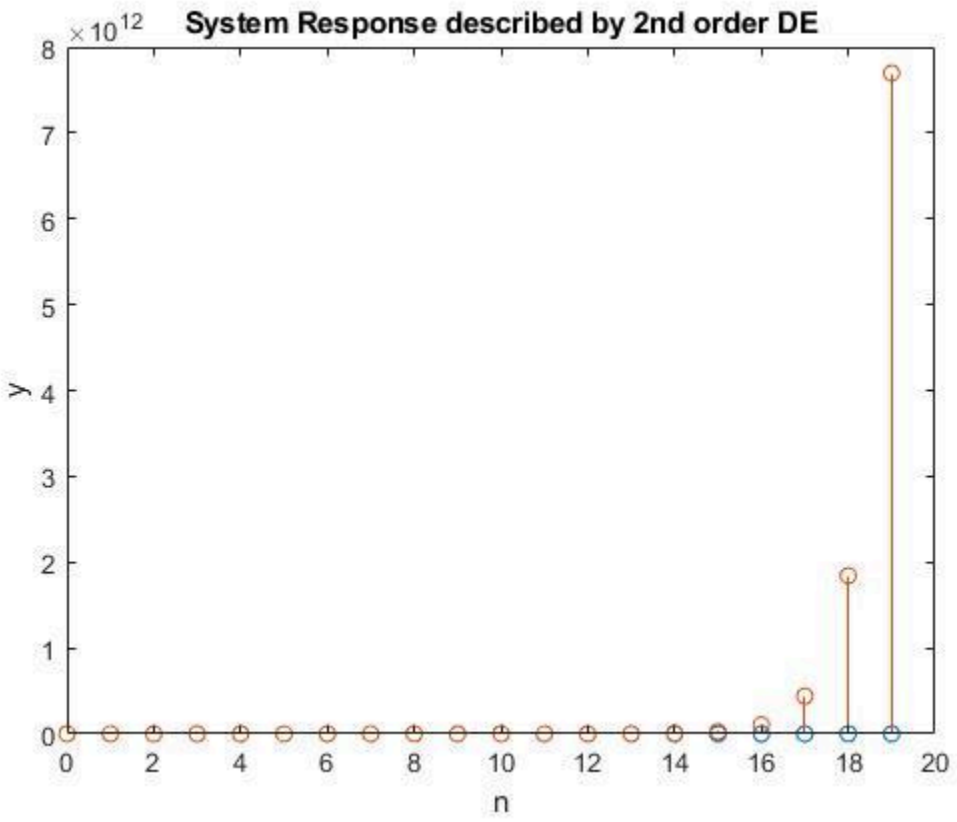
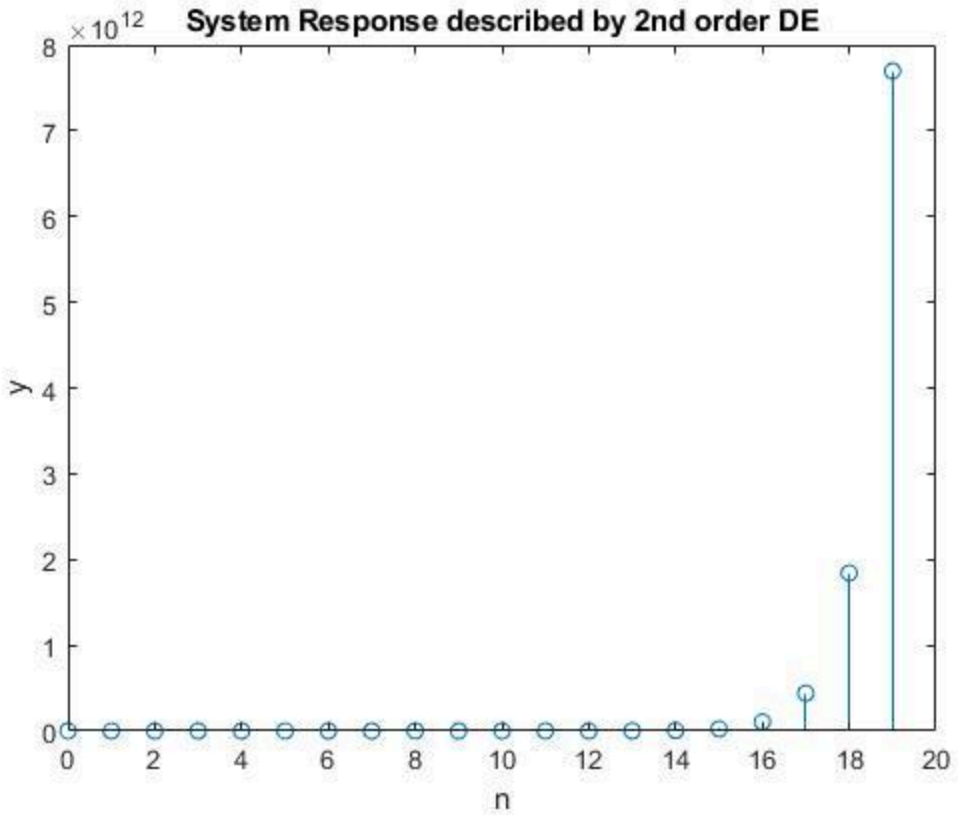
Q(5) :

```
n = 0:19;
x = 4.^n;
y = ((6/5).*n.*4.^n) + ((26/5).*4.^n)-((1/25).*(-1).^n);
xx = [n',x'];
yy = [n',y'];
stem(0:length(yy)-1,yy);
title('System Response described by 2nd order DE');
xlabel('n');
ylabel('y');

figure();
stem(0:length(y)-1,y);
title('System Response described by 2nd order DE');
xlabel('n');
ylabel('y');
```





Conclusion :

```
%{
    In Q(4), with awgn one can add additive gaussian white noise to
    obtain
    desired SNR. One graph shows vector signal and other graph shows
    signal
    with noise.
    Comparison : Direct Form 1 uses twice as many delay elements - it
    takes
    more memory to represent state of filter. Direct Form 2 uses less
    delay
    elements. So it is effective.
%}
```

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