Lab Session 01

Exercise:

Question 1:

Consider the two polynomials $p(s)=s^2+2s+1$ and $q(s)=s+1$.
Write MATLAB script to compute

a) p(s) * q(s)
b) Roots of p(s) and q(s)
c) p(-1) and q(6)

Question 2:

Write MATLAB script to find the partial fraction of the following

$$\frac{B(s)}{A(s)}=\frac{2s^3+5s^2+3s+6}{s^3+6s^2+11s+6}$$

Write answers below this line

QUESTION #01

Script:-

```
% DATA
p_s = [1 2 1]; q_s = [0 1 1];
% SOLUTION
% a)
a = conv(p_s, q_s);
% b)
b_r1 = roots(p_s);
b_r2 = roots(q_s);
% c)
c_1 = polyval(p_s, -1);
c_2 = polyval(q_s, 6);
```

```
% RESULT
fprintf('QUESTION 01')
fprintf('\n\n\t p(s) = ')
disp(p_s)
fprintf('\t q(s) = ')
disp(q_s)
fprintf('a)\n\t p(s)* q(s) = ')
disp(a)
fprintf('b)\n\t Roots of p(s)= ')
disp(b_r1')
fprintf('\t Roots of q(s)=')
disp(b_r2')
fprintf('c)\n\t Values of p(-1) and q(6) =')
disp([c_1 c_2])
```

Command Window ..

QUESTION 01

p(s) = 1 2 1

q(s) = 0 1 1

a)

p(s)* q(s) = 0 1 3 3 1

b)

Roots of p(s) = -1 -1

Roots of q(s) = -1

c)

Values of p(-1) and q(6) = 0 7

QUESTION #02

Script :-

```
% DATA
n = [2 5 3 6]; d = [1 6 11 6];
% SOLUTION
[r p k] = residue(n,d);
% RESULT
fprintf('QUESTION 02')
fprintf('\n\n\t Numerator=')
disp(n)
fprintf('\t Denominator=')
disp(d)
fprintf('\t Roots are =')
disp(r')
fprintf('\t Poles are =')
disp(p')
fprintf('\t k=')
disp(k)
```

Command Window :-

```
QUESTION 02

    Numerator =   2   5   3   6

    Denominator =   1   6   11   6

    Roots are =   -6.0000   -4.0000   3.0000

    Poles are =   -3.0000   -2.0000   -1.0000

    k =    2
```