Q3(b)

```
s = tf('s');
Gp = -25.9/(s^3+24.2*s^2-356*s-8620);
Wp = 5/(0.1*s+0.001);
Wm = (2*s+1.73)/(s+173.2);
Gr = 1e15/(s^3+1.75*1e5*s^2+2.15*1e10*s+1e15);
Wu = 1e-5;

P = [0 0 0 Wm*Gp;
     0 0 0 Wu;
     -Wp Wp*Gr -Wp -Wp*Gp;
     -1 1 -1 -Gp];

[K,CL,gamma] = hinfsyn(P,1,1)
```

```
K =

     []


CL =

     []
gamma = Inf
```

```
delta = ultidyn('del',1);
Gunc_p = (1+Wm*delta)*Gp;
% T = Gunc_p*K/(1+Gunc_p*K);
% S = 1-T;
% N = [-Wm*T Wm*T -Wm*T;
%      -Wu*K*S Wu*K*S -Wu*K*S;
%      -Wp*S Wp*(Gr-T) -Wp*S];
P_hat = [0 0 Wu;
         Wp*Gr -Wp -Wp*Gunc_p;
         1 -1 -Gunc_p];
N = lft(P_hat,K)
```

```
N =

  Uncertain continuous-time state-space model with 3 outputs, 3 inputs, 14 states.
  The model uncertainty consists of the following blocks:
    del: Uncertain 1x1 LTI, peak gain = 1, 2 occurrences

Type "N.NominalValue" to see the nominal value, "get(N)" to see all properties, and "N.Uncertainty" to interact wit
```

```
stabmarg = robuststab(N)
```

```
stabmarg = struct with fields:
                LowerBound: 0
                UpperBound: 0
    DestabilizingFrequency: 0
```

```
mu = 1/stabmarg.LowerBound
```

```
mu = Inf
```

```
perfmarg = robustperf(N)
```

```
perfmarg = struct with fields:
           LowerBound: 0
           UpperBound: 0
    CriticalFrequency: 0
```

```
mu = 1/perfmarg.LowerBound
```

```
mu = Inf
```