**Tutorials: (12.4.25)**

1. Design state feedback controller for the system given below if the desired closed loop poles are located at -10, -12. Also carry out the state observer design.



Note: Before do the controllability & Observability test

1. Find the state feedback controller gain matrix, if the desired closed loop poles are located at -4, -5, -6



1. For the above problem design state observer considering the desired closed loop pole location at -1, -2 -3.

**HINT:**

(i) for state feedback controller:

 …..(1)

Where K is the gain matrix,…[ k1, k2, k3…….]

Obtain the desired characteristics equation with the desired CL poles,..

For example, if the desired CL poles are given as µ1, µ2, µ3….for a third order system, the desired ch. Eqn. is

 0 …….(2)

Equating (1) & (2)…obtain the values of the respective gain matrix..

(ii) For observer design, similar procedure, eqn. (1) to be considered as below.

