Assignment 5

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| Q.1 | Find how many roots of the following polynomial are in the right half-plane, in the left half-plane, and on the jω-axis:  P(s) = s5 + 3s4 + 5s3 + 4s2 + s +3 |
| Q.2 | Find how many roots of the following polynomial are in the right half-plane, in the left half-plane, and on the jω-axis: |
| Q.3 | For the unity feedback system as shown    With    determine the range of K to ensure stability |
| Q.4 | Using the Routh-Hurwitz criterion, find how many roots of the following system are in the right half-plane, in the left half-plane, and on the jω-axis: |
| Q.5 | Use the Routh-Hurwitz criterion to find the range of K for which the following system is stable. |
| Q.6 | For the unity feedback system shown in Figure,    where    find the steady-state errors for the following test inputs: 25u(t); 37tu(t); 47t2u(t). |
| Q.7 | For the unity feedback system shown in Figure,    where    what steady state error can be expected for the test input 80t2u(t). |

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| Q.8 | For the system shown in figure what steady state error can be expected for the following test inputs: 15u(t); 15tu(t); 15t2u(t) |
| Q.9 | For the system shown in Figure  a. Find Kp, Kv, and Ka.  b. Find the steady-state error for an input of 50u(t), 50tu(t), and 50t2u(t).  c. State the system type |
| Q.10 | The unity feedback system of Figure    where    is to have 1/6000 error between an input of 10tu(t) and the output in the steady state.  a. Find K and n to meet the specification.  b. What are Kp, Kv, and Ka? |