1) For the systems whose characteristic equations are given below.
   i. Comment on the stability of the systems by Hurwitz test.
   ii. Determine the stability of the systems and if exists the number of the poles with positive real parts by using Routh stability criterion.

   a) \( D(s) = s^7 + 4s^6 + 5s^5 + 5s^4 + 6s^3 + 9s^2 + 8s + 2 \)
   b) \( D(s) = s^5 + 7s^4 + 6s^3 + 42s^2 + 8s + 56 \)
   c) \( D(s) = s^5 + 2s^4 + 3s^3 + 6s^2 + 5s + 3 \)

2) Using the tables and partial fractions determine the inverse Laplace transforms of the following plant transfer functions:

   a) \( G_a(s) = \frac{s+1}{s^2+6s+25} \)
   b) \( G_b(s) = \frac{15}{s^2+4s+13} \)
   c) \( G_c(s) = \frac{1}{s^3+s} \)

3) For the following unity gain feedback \((H(s) = 1)\) systems, whose closed loop transfer functions are provided, find the open loop transfer functions. Then find the type numbers by normalizing the transfer functions and determine the steady state errors of the systems to the input \( r(t) = 2h(t) + 3th(t) \).

   a) \( G_{yr}(s) = \frac{s^2+7s+12}{s^3+4s^2+9s+12} \)
   b) \( G_{yr}(s) = \frac{1}{s+2} \)
   c) \( G_{yr}(s) = \frac{3}{s^3+2s^2+3} \)