f) $y(0) = 10$; $x(t) = u(t)$; $t > 0^+$

$y'(0) = 6$

$Cp \rightarrow$ Sol. PARTICULAR

$y_{F(t)} = C_1 e^{\lambda_1 t} + C_2 e^{\lambda_2 t} + \boxed{y_p}$

$\begin{cases} C_{1F} + C_{2F} + C_p = 0 \quad \text{①} \\ -0,3542 \, C_{1F} - 5,6457 \, C_{2F} + 0 = 0 \end{cases}$

Omde C_P

$u(0^+) = 1$

$\dfrac{d^2 \cancel{C_p}^0}{dt} + 6 \dfrac{\cancel{dC_p}^0}{dt} + 2C_p = -3 u\overset{1}{\cancel{(0^+)}}$

$\boxed{C_p = -3/2}$

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$\begin{cases} C_{1F} + C_{2F} - 3/2 = 0 \\ -0,3542 \, C_{1F} - 5,6457 \, C_{2F} + 0 = 0 \end{cases}$

$C_{1F} = 3/2 - C_{2F} = \boxed{1,6004}$

$\boxed{C_{2F} = -0,1004}$

$y_{F(t)} = 1,6004 \, e^{-0,3542 t} - 0,1004 \, e^{-5,6457 t} - 3/2$

$y'_F(t) = -0,5668 \, e^{-0,3542 t} + 0,5668 \, e^{-5,6457 t}$