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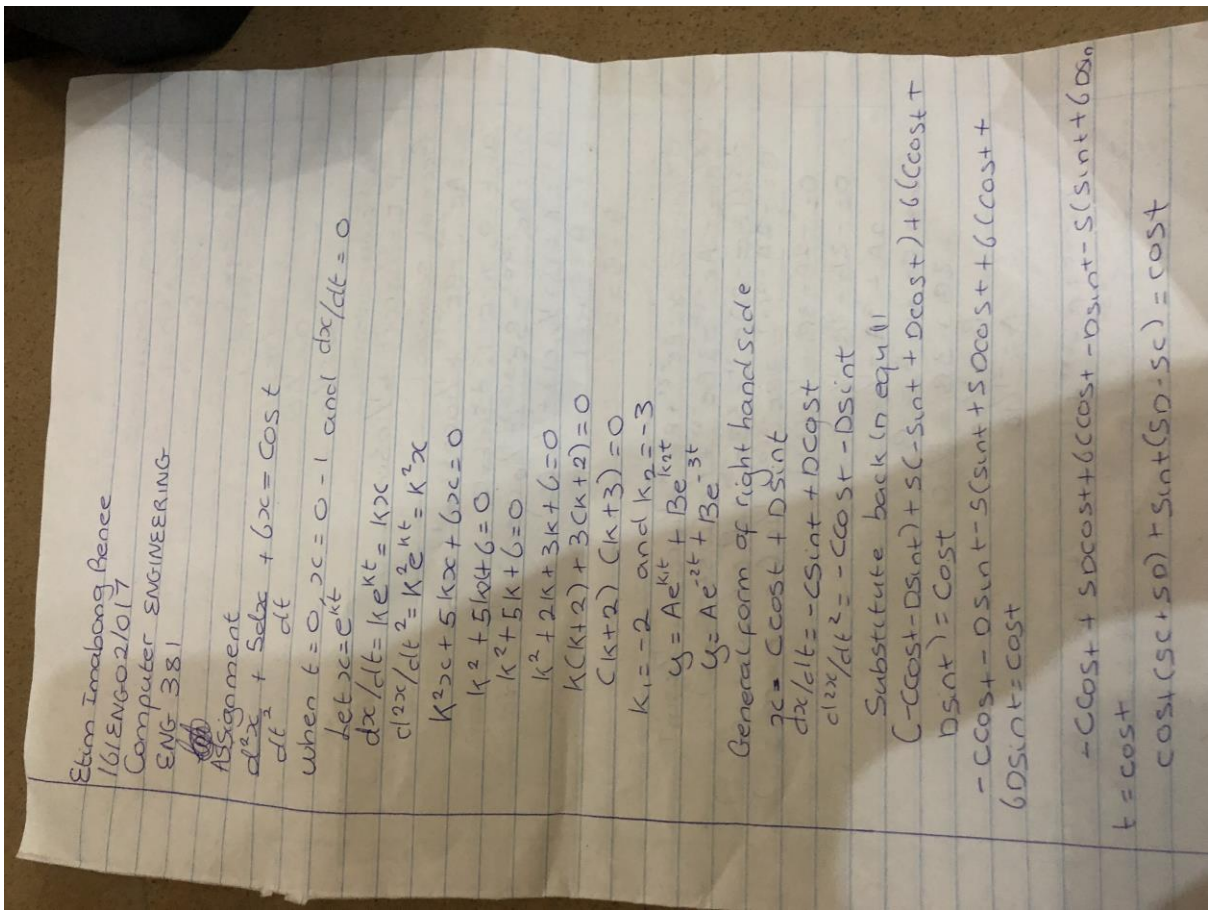


Comparing Coefficients:

$5C + 5D = 1$ ---(i)

$5D - 5C = 0$ ---(ii)

From equ (ii) $D = C$

$\therefore 5(C) + 5D = 1$

$10D = 1$

$D = 1/10$

$C = 1/10$

Particular Integral

$P.I = 1/10\cos t + 1/10\sin t$

General Solution:

$x = Ae^{-2t} + Be^{-3t} + 1/10\cos t + 1/10\sin t$

at $t = 0$, $x = 0.1$; $dx/dt = 0$

$0.1 = Ae^{-2(0)} + Be^{-3(0)} + 1/10\cos(0) + 1/10\sin(0)$

$0.1 = A + B + 1/10(1) + 1/10(0)$

$0.1 = A + B + 0.1$

$A + B = 0$ ---(i)

$dx/dt = 0$; $x = Ae^{-2t} + Be^{-3t} + 1/10\cos t + 1/10\sin t$

$dx/dt = -2Ae^{-2t} - 3Be^{-3t} + 1/10(\cos t - \sin t)$

$dx/dt = -2Ae^{-2t} - 3Be^{-3t} + 1/10(-\sin t + \cos t)$

$0 = -2A - 2(0) - 3Be^{-3(0)} + 1/10(-\sin 0 + \cos 0)$

$0 = -2A - 3B + 1/10(1)$

$0 = -2A - 3B + 1/10$

$2A + 3B = 1/10$ ---(ii)

From equ(i) $A = -B$

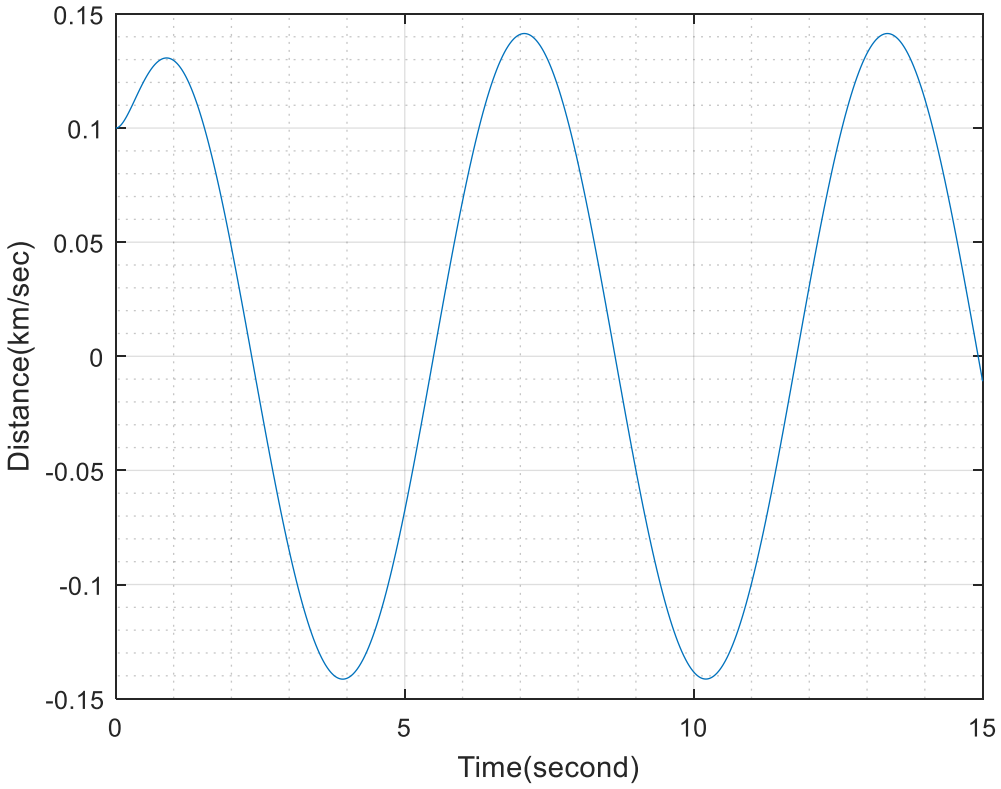
$-2B + 3B = 1/10$

$B = 1/10$

$A = -1/10$

$x = Ae^{-2t} + Be^{-3t} + 1/10\cos t + 1/10\sin t$

$x = \frac{-1}{10}e^{-2t} + \frac{1}{10}e^{-3t} + \frac{1}{10}\cos t + \frac{1}{10}\sin t$


0.15
0.1
0.05
0
-0.05
-0.1
-0.15
Distance(km/sec)
0
5
10
15
Time(second)