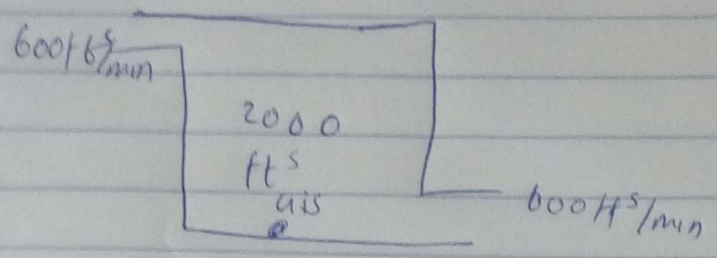
AGABOOCA PRAISE
16/ENG/0510/05
MECHATRONICS
Assignment



$dy/dt = y_{in} - y_{outb}$

$y_{in} \Rightarrow 600$

$y_{outb} = \frac{600}{2000} = 0.03y$

$\frac{dy}{dt} \Rightarrow 600 - 0.02y$

$\frac{dy}{dt} = -0.03(y - 20000)$

$\Rightarrow \int \frac{dy}{(y-2000)} = \int -0.0321$

$\ln(y - 20000) = -0.03t + C$

$y - 20000 = e^{-0.03t + C}$

$y - 20000 = y_0 e^{-0.03t}$

$y = y_0 e^{-0.03t} + 20000$

a) At $t=0$; $y=0$

$y = y_0 e^{-0.03t} + 20000$

$0 = y_0 e^{-0.03(0)} + 2000$

$\therefore y_0 = -20000$; $y = -20000 e^{-0.03t} + 2000$ - model

b) $10\% \times 20000 = 18000$

$y = 18000$