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Mat No: 19\ENG05\072

Course Code: ENG 282

ASSIGNMENT V:

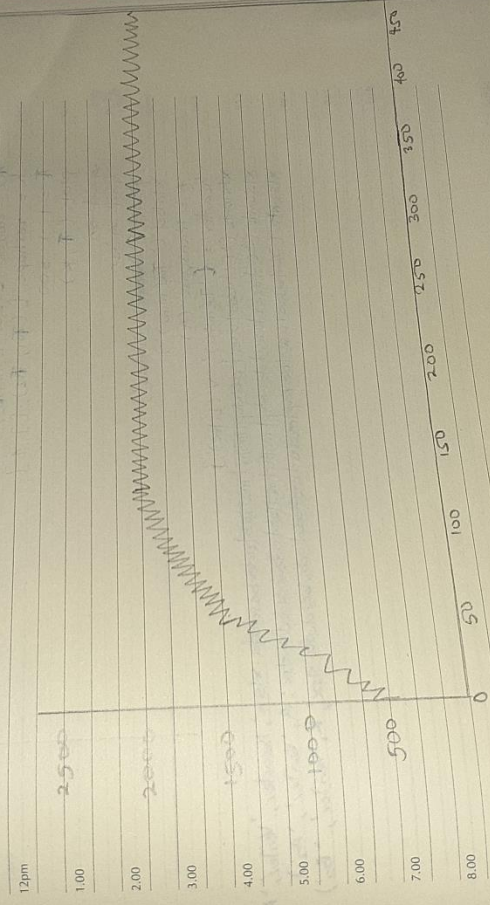
1.

NOTES
Urgent

(1) $\frac{dm}{dt} = \text{Min} - \text{Mout}$
 $\text{Min} = 50 \text{ gal min}^{-1} \times (1 + \sin t) 16 \text{ gal}^{-1}$
tank contains = 1200 gal of water
 30 gal min^{-1} = rate moisture leaves
 $\therefore 30 = I$ of water is entering
1200 40 and leaving
 $\frac{dm}{dt} = 50(1 + \sin t) - 40$
 $\frac{dm}{dt} + I = m = 50(1 + \sin t)$
 $I = 40$
 $M \cdot e^{40t} = 50 \int (1 + \sin t) e^{40t}$
Using integration by part for RHS
 $\int e^{40t} + \int \sin t \cdot e^{40t}$
 $u = \sin t \quad dv = e^{40t}$
 $du = \cos t \quad v = 40 e^{40t}$
 $\int e^{40t} + (\sin t)(40 e^{40t}) - \int (40 e^{40t})(\cos t) dt$
 $\int e^{40t} + (\sin t)(40 e^{40t}) - 40 \int e^{40t} \cos t dt$
 $(\text{L.H.S}) I = \int (\sin t) e^{40t}$
 $I = (\sin t)(40 e^{40t}) - 40 \int e^{40t} \cos t dt$
 $du = -\sin t \quad dv = 40 e^{40t}$
 $u = \cos t \quad dv = 40 e^{40t}$
 $du = -\sin t \quad dv = 40 e^{40t}$
 $= (\sin t)(40 e^{40t}) - 40 \int (\cos t)(40 e^{40t}) + \int (40 e^{40t})(\sin t) dt$
R.L.H.S, $I = \int (\sin t) e^{40t}$
 $I = (\sin t)(40 e^{40t}) - 40 \int (\cos t)(40 e^{40t}) + 40 I$
 $I = (\sin t)(40 e^{40t}) - 40 \int (\cos t)(40 e^{40t}) - 1600 I$
 $I + 1600 I = (\sin t)(40 e^{40t}) - 40 \int (\cos t)(40 e^{40t}) + 1600 e^{40t}$
 $1601 I = (\sin t)(40 e^{40t}) - 1600 e^{40t} (\cos t)$

$I = (\sin t)(40 e^{40t}) - 1600 e^{40t} (\cos t) + C$
 $50 I = 50 (\sin t)(40 e^{40t}) - 80000 e^{40t} (\cos t) + C$
 $50 \int e^{40t} = 50 (40 e^{40t}) = 2000 e^{40t}$
 $\therefore M \cdot e^{40t} = 2000 e^{40t} + 50 I$
 $M = 2000 + 50 I$
when $t = 0$,
 $50 I = 0 - 80000 + C = -499688 + C$
 1601
 $M = 2000 + (-499688) + C$
 $150 = -1950.03 + C$
 $\therefore C = -1800.03$
 $M = -1800 e^{0.25t}$

7:00 Command window
8:00 clear
9:00 close all
9:00 syms m t
10:00 $A = \text{dsolve}('Dm + 0.025 * m = 50 + 50 * \sin(t)', m(0) = 150)$
11:00 $t = 0 : 0.5 : 450$
 $tn = \text{subs}(A, t)$
plot(t, tn)



January 2021
M T W T F S S
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29

November
M T W T F S S
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29

Notes

2.

(7)

7:00 Command Window

8:00 Clear

8:00 CLC

8:00 Close all

9:00 Syms T

10:00 $b = 1 : 2 : 500$

$Y = (50/0.05) * [(50/1.0025)^T * \sin(CT) + T * [(50 * 0.5/1.0025) * \cos(T) - 802.49 * \exp(-0.05 * T)]]$

11:00 $T_1 = 2 : 2 : 500$

$Y_m = 1000 - 800 * \exp(-0.05 * T)$

$T_z = \text{double}(\text{subs}(T_m, T_1))$

$K = \text{reshape}(C(T_n, T_z), [1, 1])$

$T = 1 : 1 : 500$

Plot (T, K)

xlabel('Time (mins)')

ylabel('Models')

$\text{K} = \text{transpose}(\text{K})$

header = ['Time (mins)', 'V(Lists)']

xlswrite('otex\besdata.xlsx', header, 'Vexler', 'A1')

xlswrite('otex\besdata.xlsx', T, 'Vexler', 'A2')

xlswrite('otex\besdata.xlsx', K, 'Vexler', 'B2')

6:00

7:00

8:00

9:00

10:00

11:00

12:00

1:00

2:00

3:00

4:00

5:00

6:00

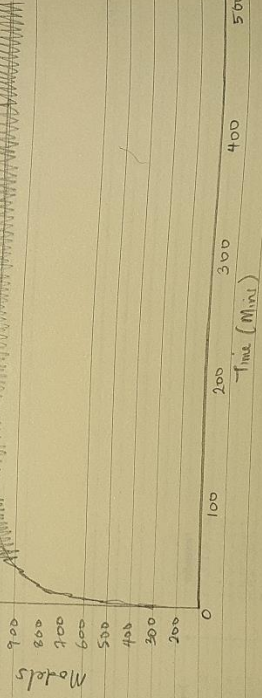
7:00

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10:00

11:00



Models

Notes