

RAJ I UMMI-SALMA ONIZE

18/ENG08/020

1) initial reading = 10°C

20°C

actual temp = 25°C

$$\frac{dT}{dt} = -k(T - T_m)$$

T_m , temp of medium

k , probability constant

T , temp. of the body

$$\frac{dT}{dt} + kT = kT_m$$

$$\frac{dT}{dt} + k10^{\circ}\text{C} = k(25^{\circ})$$

$$\frac{dT}{dt} = k(25 - 10)$$

$$\frac{dT}{dt} = 15k$$

$$dT = 15k dt$$

$$\int \frac{dT}{k} = \int 15 dt$$

$$\frac{1}{k} \int dT = \int 15 dt$$

$$\frac{1}{k} T = 15t$$

after 5, $T = 20^{\circ}\text{C}$

$$\frac{1}{k} (20) = 15 \times 5$$

$$\frac{20}{k} = 75$$

$$75k = 20$$

$$k = \frac{20}{75}$$

$$\frac{75}{20} T = 15t$$

The time required for the reading to practically reach system temp, take $T = 24.9$

$$\frac{75 \times 24.9}{20} = 15t$$

$$t = \frac{75 \times 24.9}{20 \times 15}$$

$$t = 6.22 \text{ mins}$$

```
- commandwindow
- clear
- clc
- close all
- format short g
- mdata=xlsread('onlinequizdata','fluiddata')
- x=mdata(1:2:250,1)
- y=mdata(1:2:250,2)
- plot(x,y)
- grid on
- grid minor
```

I

Command Window

```
86
88
90
92
94
96
98
100
102
```

script

