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#jidnyasa Mahajan

# To find Decay Coefficient at 25C

K1 = float(input("Decay Coefficient at temperature T1: "))

T1 = float(input("Temperature of 3rd day BOD (T1): "))

T2 = float(input("Temperature for 7th day BOD (T2): "))

theta = 1.047

K2 = K1 * (theta**(T2 - T1))

print(f"The value of K2 at {T2}°C is: {K2}")

# To find Ultimate BOD (Lo)

Bt = float(input("BOD at time t: "))

t = float(input("Time in days for finding BOD (t): "))

K = float(input("Decay Coefficient (K) at the temperature of BOD measurement: "))

import math

Lo = Bt / (1 - math.exp(-K * t))

print(f"The value of Ultimate BOD (Lo) is: {Lo}")

t1 = float(input("Time in days for finding BOD at time t1: "))

BOD_at_t1 = Lo * (1 - math.exp(-K * t1))

print(f"The value of BOD at time {t1} days is: {BOD_at_t1}")

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Output:-

Decay Coefficient at temperature T1: 0.23

Temperature of 3rd day BOD (T1): 20

Temperature for 7th day BOD (T2): 25

The value of K2 at 25.0°C is: 0.2893751572825015

BOD at time t: 2.718

Time in days for finding BOD (t): 50

Decay Coefficient (K) at the temperature of BOD measurement: 3

The value of Ultimate BOD (Lo) is: 2.718

Time in days for finding BOD at time t1: 7

The value of BOD at time 7.0 days is: 2.71799999793906

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#jidnyasa Mahajan

#Determination if density of sludge removed from aeration tank

M= float(input("Enter the value of initial mass :"))

S=float(input("Enter the value of solid containing sludge in percentage:"))

Gs= float(input("Enter the value of Specific gravity of sludge solid:"))

Rho_W= float(input("Enter the value of density of water:"))

Ws = (S/M)*100

m = M - Ws

print("the value of mass of water", m)

print("The value of Solid Content in sludge", Ws)

Vw = m / Rho_W

print ("The Value of Volume", Vw)

Rho_S = Gs * Rho_W

print("The value of Density of solid content in sludge", Rho_S)

Vs=(Ws/(Gs*Rho_S))

print("The value of volume of solid content in sludge", Vs)

Vt= Vw + Vs

print("The value of total volume of solid content in sludge", Vt)

Rho_SL= M / Vt

print("The value of Density of sludge removed from aeration", Rho_SL)
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Output:-

Enter the value of initial mass :100

Enter the value of solid containing sludge in percentage:2

Enter the value of Specific gravity of sludge solid:2.2

Enter the value of density of water:1000

the value of mass of water 98.0

The value of Solid Content in sludge 2.0

The Value of Volume 0.098

The value of Density of solid content in sludge 2200.0

The value of volume of solid content in sludge 0.00041322314049586776

The value of total volume of solid content in sludge 0.09841322314049587

The value of Density of sludge removed from aeration 1016.1236143768895