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import math

# To find Decay Coefficient at 25C
K1 = float(input("Decay Coefficient: "))
T1 = float(input("Temperature of 3rd day BOD: "))
T2 = float(input("Temperature of 7th day BOD: "))

# Calculate K2
K2 = K1 * (1.047 ** (T2 - T1))
print("The value of K2 is:", K2)

# To find Ultimate BOD e =
2.718 # value of e
print("The value of e is:", e)

# Input for BOD at 3rd day
B1 = float(input("BOD at 3rd day 20C: "))
t = float(input("Time in days for finding B1: "))

# Calculate E
E = (1 - math.exp(-0.23 * t)) # Assuming decay coefficient of 0.23
print("The value of E is:", E)


# Calculate BOD at 0 days B0 = B1 / E
print("The value of B0 is:", B0, "mg/lit")

# Input for BOD at 7th day t1 = float(input("Time
in days for finding B2: "))

# Calculate E1
E1 = (1 - math.exp(-0.289 * t1)) # Assuming decay coefficient of 0.289
print("The value of E1 is:", E1)

# Calculate B2 using B0 and E1
B2_calculated = B0 * E1
print("The value of B2 is:", B2_calculated, "mg/lit")

```

 Decay Coefficient: 23
 Temperature of 3rd day BOD: 20
 Temperature of 7th day BOD: 25
 The value of K2 is: 28.93751572825015
 The value of e is: 2.718
 BOD at 3rd day 20C: 50
 Time in days for finding B1: 3
 The value of E is: 0.49842393093394455
 The value of B0 is: 100.31621055255157 mg/lit
 Time in days for finding B2: 7
 The value of E1 is: 0.8677419049620279
 The value of B2 is: 87.04857964344298 mg/lit

```
# Determination of density of sludge removed from aeration tank M =  
float(input("Enter the value of initial mass: "))
```

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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: "))
```

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# Calculate mass of water removed  $W_s = (S / M) * 100$  m = M -  $W_s$ 
```

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# Display mass of water and solid content in sludge print("The value of mass of  
water:", m) print("The value of Solid Content in sludge:",  $W_s$ )
```

```
# Calculate volume of water removed  $V_w = m / Rho\_W$  print("The Value of Volume:",  
 $V_w$ )
```

```
# Calculate density of solid content in sludge  $Rho\_S = G_s * Rho\_W$  print("The  
value of Density of solid content in sludge:",  $Rho\_S$ )
```

```
# Calculate volume of solid content in sludge  $V_s = (W_s / (G_s * Rho\_S))$  print("The  
value of volume of solid content in sludge:",  $V_s$ )
```

```
# Calculate total volume of solid content in sludge  $V_t = V_w + V_s$  print("The value  
of total volume of solid content in sludge:",  $V_t$ )
```

```
# Calculate density of sludge removed from aeration tank  $Rho\_SL = M / V_t$   
print("The value of Density of sludge removed from aeration:",  $Rho\_SL$ )
```

```
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
```

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