

```

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: "))

```

```

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: "))

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

# 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:", Ws)

# Calculate volume of water removed
Vw = m / Rho_W
print("The Value of Volume:", Vw)

# Calculate density of solid content in sludge
Rho_S = Gs * Rho_W
print("The value of Density of solid content in sludge:", Rho_S)

# Calculate volume of solid content in sludge
Vs = (Ws / (Gs * Rho_S))
print("The value of volume of solid content in sludge:", Vs)

# Calculate total volume of solid content in sludge
Vt = Vw + Vs
print("The value of total volume of solid content in sludge:", Vt)

# Calculate density of sludge removed from aeration tank
Rho_SL = M / Vt
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

```