Ans (1)

Step I :→ Bearing Dimensions :- calculate the bearing length by choosing a ratio of l/d from data book.

Step II :- Bearing pressure :- check the bearing pressure, p = W/d from data book, for satisfactory value.

Step III :- Selection of Bearing :- Now assume a lubricant from data book and its operating temperature (to) this temp. should be in range of 25.5°C to 60°C

Step IV :→ Sommerfeld Number :- calculate the value of sommerfeld check this value with corresponding value from data book, for determining the possibility of maintaining fluid film operation.

Step (V) clearance Ratio :- Now, assume a clearance ratio (i.e. c/d) from data book.

Step VI :→ Coefficient of friction :→ calculate the coefficient of friction (μ) by using the relation given below.

$$\mu = \frac{0.336}{10^6}\left(\frac{2N}{P}\right)\left(\frac{d}{c}\right) + K$$

Step VII : **Heat Generated** :→ calculate the heat generated (Q_g) by using the relation given below

$$Q_g = \mu W V$$

Step VIII :→ **Heat Dissipation** :→ calculate the heat dissipation (Q_d) by using the relation given below.

$$Q_d = CA(t_b - t_a)$$

Step IX : **Thermal Equilibrium** :→ At last, calculate the thermal equilibrium to see that the heat dissipated becomes at least equal to the heat generated.