Q5. In plane transmission grating the angle of diffraction for the second order principal maxima for the wavelength 5 x 10^{-5} cm is 35®. Calculate the number of lines/cm on the diffraction grating.

Given:- l=5x10^{-5}cm ; θ =35® ; n=2

Formula:- $(a+b)\sin\theta = n\lambda$; $\frac{1}{a+b}$= number of lines/cm

Solution:- a+b=$\frac{n\lambda}{sin\theta}$ = $\frac{2\times5\times10^{-5}}{sin35^{\circ}}$ = 1.74 x 10^{-4}

Number of lines per cm = $\frac{1}{a+b}$ = $\frac{1}{1.74\times10^{-4}}$ = 5735

Ans:- The number of lines pre cm is 5735.