

1. In a Plane transmission grating the angle of diffraction for second order principal maximum for the wavelength  $5 \times 10^{-5}$  cm is  $30^\circ$ . Calculate the number of lines/cm on the grating surface.
2. Calculate the highest order spectrum that can be obtained by monochromatic light of wavelength  $6000 \text{ \AA}$  by a grating with 6000 lines/cm.
3. A diffraction grating used at normal incidence gives a line  $5400 \text{ \AA}$  in a certain order superimposed on another line  $4050 \text{ \AA}$  of the next higher order. If the angle of diffraction is  $30^\circ$ , how many lines/cm are there on grating?

4. In an experiment with grating, third order wavelength coincides with the four order spectral line of wavelength  $4992 \text{ \AA}$ . Calculate the value of the wavelength.

5. A grating has 620 rulings/mm and is 0.5mm wide. What is the smallest wavelength interval that can be resolved in the third order at  $\lambda = 481 \text{ nm}$ ?

6. Find the maximum resolving power of a grating 2 cm with 6000 lines/cm illuminated by a light of wavelength  $5890 \text{ \AA}$ .