

Ques. what do you understand by resolving power?

Explain Rayleigh's criterion for the limit of resolution. obtain an expression for the resolving power of a prism.

Ans. Resolving power \rightarrow The ability of an optical instrument to just resolve the images of two near by points sources. is called its resolving power.

Sunday

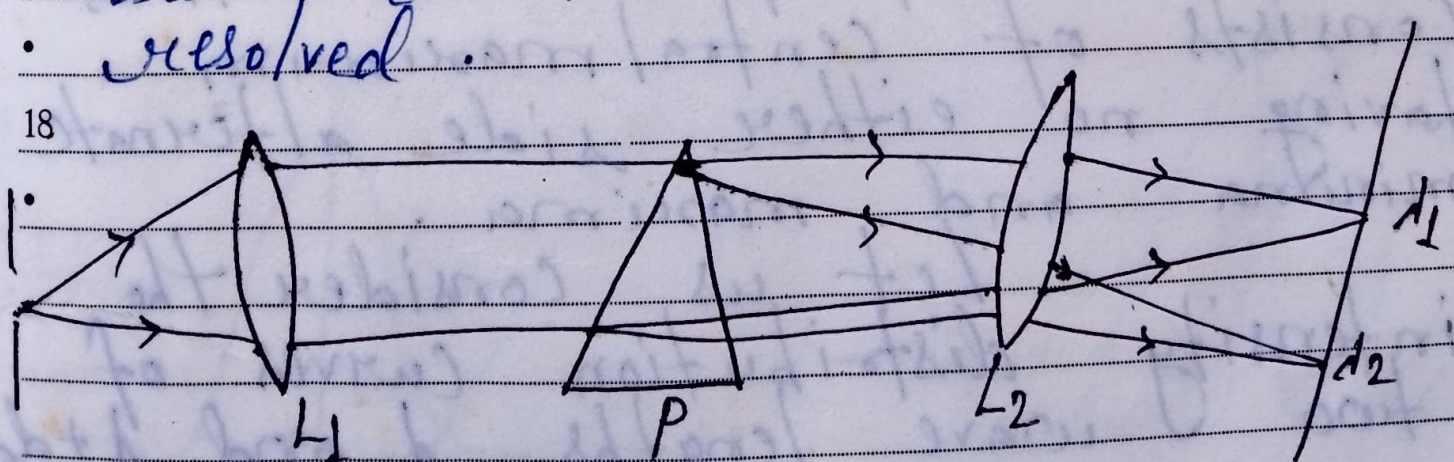
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February

34th Day

Considering a simple prism spectroscope where S is narrow slit illuminated by a source which emits two close wavelengths λ_1 and λ_2 , a spectrum consisting of two lines corresponding to λ_1 and λ_2

8 is received in the focal plane of L_2 .
 In reality the focus of the prism
 9 act as diffracting apertures.
 so the two lines in the spectrum
 10 are actually two Fraunhofer diffraction
 patterns close together having
 an intensity distribution. The two
 11 patterns overlaps each other in
 general but overlapping is only to
 12 a little extent, the principle
 maxima the two patterns are
 13 indistinguishable the lines are said to
 be resolved. On the other hand if pattern
 14 overlap to such extent that the
 resultant intensity indicates no
 15 drop in the middle then it is
 impossible to judge whether the
 16 pattern corresponds to a single
 line or two close lines. In
 17 such condition lines are not
 resolved.



Notations

Therefore, the resolving power
of such an optical instrument
is defined as the number of
spectral lines.