Fiber ophes:

- 1: Explain the different types of losses resulting in progation of light through optics fibre.
- Aus: The loss is found to be a function of fibre material, wavelength of light and dimension of the fibre.

Bending loss:

- · accurs when the fibre is bent too slaryly causing some of the light to escape from the core.
- -> Moirobending: Jarge bends that causes light
 to leak

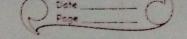
 -> Microbending: Jight bends, light (less loss)

Absorbtion loss:

· When impurites in the fibre absorbs jart of the light energy, converting it into heat defeats from the impurities.

Scattering los:

As light travels, it can scatter in deferent direction due to irregularities in the material.



2. Define acceptance angle and numerical aperture. Derive an expression for numerical aperture and acceptance angle in optical fibre.

Ans: Acceptance Angle:

The acceptance angle is the maximum angle at which light can enter the fibre and still be propagated through the core by TIR.

Angle between the incoming light racy and fibre axis

Mumerical aperture:

· Key parameter that represents the lightgathering ability of the fibre. Relates the refractive indices of core (n.) and cladding (n2) and determines the range of angles over which the fibre can accept light

· The sine of mascinium acceptaine angle is called NA

NA = SIR (Omax)

· For most fibres n, 2 n2

 $NA = \sqrt{n_1^2 - n_2^2}$

Derwation: A THE WEST OF STREET nisindi = nisindi For TIR to occur. ceplance sin (Oc) = n2, Oc is the criticle angle NA = sm (Omax) = Jni2-n22 ale peterseon the exemined hight range breami unional apointes: low fanomoter that majorente the light cothering ability of the Almos Pelater operation and icos of core (m) and place

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