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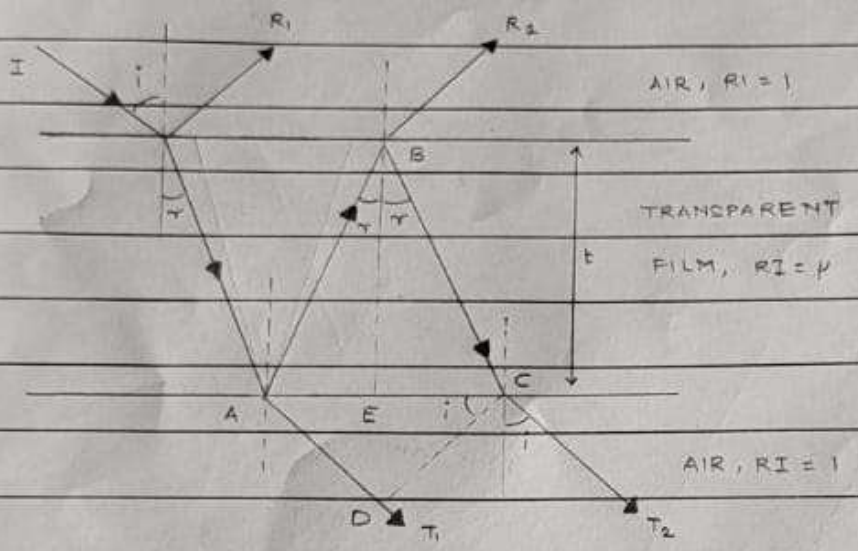
11. Derive the equations for maxima and minima due to interference in the transmitted light.

→ For a light transmitted from a thin transparent film of uniform thickness, waves are reflected from upper and lower surfaces of the film (internal reflections), which is a denser medium. Since both the reflections occur at the surface of air (rarer medium), there is no phase change and the factor $\lambda/2$ does not arise.



in this case, optical path difference = $\mu(AB + BC) - AD$

note that, the factor $\lambda/2$ is missing as there is no phase reversal. due to this, the conditions of interference would be complementary to those obtained in the reflected light. They are given by,

$2\mu t \cos r = n\lambda$ — maxima/ brightness

$2\mu t \cos r = (2n-1)\lambda/2$ — minima/ darkness

here, $n = 1, 2, 3, \ldots$