TITLE :- Interference of light in thin film :.

* - Condition of maxima and minima in Reflected Light :-

The two rays will reinforce each other if the path difference between them is an integral multiple of λ i.e. when

$2\mu t\cos r - \lambda/2 = n\lambda$, $n = 0, 1, 2$ --- etc

$2\mu t\cos r = (2n+1)\lambda/2$ (Condition of maxima) (2)

When this condition is satisfied, the film will appear bright in the reflected light

Again, the two rays will destroy each other if the path difference between them is the odd multiple of $\lambda/2$ i.e. when

$2\mu t\cos r - \lambda/2 = (2n-1)\lambda/2$ $\cdot$ $n = 1, 2, 3$ ---

$2\mu t\cos r = n\lambda$ (condition of maxima)

Path difference in transmitted Light :-

The path diff. between the transmitted ~~light~~ rays BT_1 and DT_2 is similarly given by

$\Delta = \mu(BC + CD) - BL$

$= 2\mu t\cos r$

If Light travels from denser to rarer medium, there is no change in phase due to reflection at B or C.

Hence the effective path difference BT_1 and DT_2 is also $\boxed{2\mu t\cos r}$