

TERMS

Be able to define or discuss the following terms with their SI units, if any.

1. magnifier
2. angular magnification M
3. microscope
4. telescope
5. monochromatic light
6. coherence
7. constructive interference
8. destructive interference
9. phase difference ϕ
10. path difference $r_2 - r_1$
11. Michelson interferometer

EQUATIONS

Understand the meaning and know the SI units of all the symbols in these equations—and be able to use the equations to solve problems.

$$1. M \equiv \frac{\theta'}{\theta} = \frac{25 \text{ cm}}{f}$$

$$2. \phi = \frac{2\pi}{\lambda} (r_2 - r_1)$$

$$3. \text{Eq. (35.4)}$$

$$4. 2t = m\lambda \text{ (where } m = 1, 2, 3, \dots \text{ and } \lambda = \frac{\lambda_0}{n} \text{)}$$

$$5. 2t = (m + \frac{1}{2})\lambda \text{ (where } m = 0, 1, 2, 3, \dots \text{ and } \lambda = \frac{\lambda_0}{n} \text{)}$$

$$6. 2y = m\lambda$$

SKILLS

Use the material in these sections to be able to:

1. use that, for normal (perpendicular) reflection off dielectrics, there is zero phase shift upon reflection off a lower n medium and there is a π rad phase shift upon such reflection off a higher n medium.
2. state that a reflection maximum gives a transmission minimum while a reflection minimum gives a transmission maximum for a insulating thin film (by conservation of energy).

SUMMARY—THIN INSULATING FILMS, NORMAL INCIDENCE

Number of phase shifts of π rad upon reflection	0 or 2	1
Reflection maximum and transmission minimum	$2t = m\lambda$	$2t = (m + \frac{1}{2})\lambda$
Reflection minimum and transmission maximum	$2t = (m + \frac{1}{2})\lambda$	$2t = m\lambda$

Page 1164, Fig. 35.5 and its captions: Compared to Figs. (35.2), (35.3), (35.6), (35.7), and so on, this figure is upside down.

Page 1171, above and below Eq. (35.16): Since the amplitude can, by definition, never be negative, change “amplitude” to “component” twice above Eq. (35.16) and once (in the plural) below it.

Those who think they have not time for bodily exercise will sooner or later have to find time for illness.

Edward Stanley