LEO101 LU2 OPTICAL HANDLING & POSITIONING EXAM

What are the units of “index of refraction?”
- a. mm
- b. watts
- c. m/s
- d. none

Which wavelength has the highest index of refraction?
- a. Violet Light
- b. Infrared Light
- c. Ultraviolet Light
- d. Green Light

Which one of the following properties should be very high in a lens?
- a. absorption
- b. transmission
- c. reflection
- d. scattering

1100 watts is incident on a focusing lens and 92 watts exits the lens, what is the transmission?
- a. 92%
- b. 92 watts
- c. 8%
- d. 8 watts

Why would a fused silica lens be a bad choice for a carbon dioxide laser emitting 10.6 microns?
- a. too small diameter
- b. not thick enough
- c. does not transmit
- d. cost too much
- e. Not coated

What is the angle of incidence where no parallel polarized light is reflected?
- a. polar angle
- b. Parallel angle
- c. Brewster’s angle
- d. Plane angle
- e. Newton’s angle

Optical material properties that can affect the beam include which of the following:
- a. Melting point
- b. Stress
- c. Water solubility
- d. Aberrations

In optical coating, the material to be coated is called the _____.
- a. mirror
- b. lens
- c. substrate
- d. blank

A coating that cuts down on reflection losses is called a(an) _____ coating.
- a. dielectric
- b. reflection
- c. transmission
- d. antireflection

A coating that increases the amount of light “bouncing” off of the optic is a(an) _____.
- a. high-reflection coatin
- b. non-transmissive coating
- c. interference coating
- d. refractive coating

A type of filter that passes a wide range of wavelengths is referred to as a _____ filter.
- a. wide band
- b. narrow bandpass
- c. broadband
- d. neutral density
- e. cut-off

An internal defect in an optical element is referred to as a what?
- a. internal scratch
- b. internal dig
- c. inclusion
- d. pollution

The best method of cleaning a new, perfectly clean optic is what?
- a. not to clean it
- b. use the dragwipe method
- c. use only cotton balls
- d. start with reagent grade alcohol
- e, Use only detergent

An optical filter that allows higher wavelengths to pass and blocks lower wavelengths is a _____filter.

a. long-wave pass
b. narrow band pass
c. broadband
d.hot mirror

Which of the following allow a tiny range of wavelengths to pass and block all others?

a. long-wave pass
b. narrow band pass
c. broadband
d. hot mirror

A filter that mimics the spectra response of the human eye is called a _____ filter.

a. radiometric
b. narrow band pass
c. broadband
d. photometric

_____ are small pieces of material that have broken away from the side of an optic and become an issue if they become larger than 0.5mm.

a. Straie
b. Block reek
c. Edge Chips
d. Digs

These lines or markings on the surface of an optics are due mainly to mishandling. A value given to this represents it's width.

a. Scratch
b. Block reek
c. Fungus
d. inclusion

Small pits or craters in an optical surface are called_____..

a. digs
b. scratch
c. craters
d. inclusions

If two optics are cemented together, as in an achromatic lens, why is Acetone a bad choice for cleaning?

a. Eats the glue
b. changes the index of refraction
c. evaporates too fast
d. causes pitting in the glass

As this light property increases, the index of refraction of an optical element decreases.

a. wavelength
b. displacement
c. frequency
d. amplitude

Which of the following should be low or minimal in a transmissive optic like a lens or a window?

a. reflectivity
b. absorption
c. distortion
d. scatter

Light _____ as it passes from air into a piece of optical grade glass.

a. speeds up
b. slows down
c. remains constant

Absorption of light in a material is _____.

a. always necessary
b. random in visible light
c. wavelength dependant
d. not predictable

The optical density of an optical element is 2.5. Find the transmission.

a. 0.0032
b. 0.01
c. 0.1
d. 0.025

A filter has an absorption coefficient of $1.8cm^{-1}$ and is 0.12cm thick, find the transmission.

a. 81%
b. 1.24%
c. 0.09
d. 0.0012

A gallium arsenide lens has an index of refraction of 3.12. If left uncoated, what would be the single surface reflection? (index of refraction of air is 1.0)

a. 26.5%
b. 0.08%
c. 51.4%
d. 1.94%

What can be done to nearly eliminate unwanted reflections on a transmissive optic?

a. add an antireflection coating
b. attach it to an achromat
c. clean the optic
d. use it in the dark

Brewster's Angle is used to transmit _____ light.

a. coherent
b. polarized
c. single wavelength
d. laser

Acetone should not be used on plastic or bonded optics because it

a. turns it blue
b. doesn't clean it well
c. is only used to clean fingernail polish
d. will etch the plastic and dissolve the glue

Fill in the blank:

When handling a laser grade optic one should:

Open the packaged optic in a dust free room.
Always wear gloves.
Hold optics only by their edges.
Only clean the optic if necessary.
Never use dry tissue to wipe an optical surface.