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**Forensic Use of Light Exam**

\_\_\_\_\_\_1. Hair viewed for forensic investigations is studied both macroscopically and microscopically. Macroscopic observation might be done with a \_\_\_\_\_\_\_\_\_\_, while microscopic observation would be done with a \_\_\_\_\_\_\_\_\_\_\_\_.

1. Microscope, electron microscope
2. Spectrophotometer, stereomicroscope
3. Stereomicroscope, compound microscope
4. All of the above

\_\_\_\_\_\_2. Many dyes and other hair treatments will fluoresce under a certain color (wavelength) of light. In a fluorescence microscope, a beam of light of a certain color is used. If the sample contains particular chemicals, it will absorb some of the light and then reemit light of a different color. This is called

1. Fluorescence
2. Effervescence
3. Incandescence
4. None of the above

\_\_\_\_\_\_3. Two methods that can analyze fibers are

1. Polarizing light microscopy and infrared spectroscopy
2. Polarizing light spectroscopy and infrared microscopy
3. Heat and light
4. None of the above

\_\_\_\_\_\_4. A forensic light source should include

1. All wavelengths of light (including some outside of the visible)
2. White light
3. Black light
4. All of the above

\_\_\_\_\_\_5. The refractive index is a tool used to study how light bends as it passes through

1. Three or more substances
2. One substance and into another
3. Four or more substances
4. None of the above

\_\_\_\_\_\_6. When light travels through any medium other than a vacuum, the particles in that medium slow the light down. As the density of the medium increases, the

1. Speed of light passing through that material increases
2. Speed of light passing through that material decreases
3. Amount of light passing through that material decreases
4. None of the above

\_\_\_\_\_\_7. The speed of light passing through air is slightly

1. Slower than the speed of light passing through a vacuum, because air is slightly denser than a vacuum
2. Faster than the speed of light passing through a vacuum, because air is slightly denser than a vacuum
3. Slower than the speed of light, because air is slightly less dense than air traveling at the speed of light
4. None of the above

\_\_\_\_\_\_8. Refraction

1. Describes the behavior of light as it travels through time
2. Describes the behavior of light as it travels from one part of one medium into a different part in the same medium
3. Describes the behavior of light as it travels from one medium into a different medium
4. Describes the behavior of light as it brightens

\_\_\_\_\_\_9. One method of determining if the evidence glass matches the glass from the crime scene is to compare the

1. Index of the evidence glass to the index of the glass from the crime scene
2. Refractive index of the evidence glass to the refractive index of the glass from the crime scene
3. Reflective index of the evidence glass to the reflective index of the glass from the crime scene
4. None of the above

\_\_\_\_\_\_10. The submersion method involves placing the glass fragment into different liquids of known refractive indexes. If a piece of glass and a liquid have the same refractive index, the glass fragment will seem

1. Larger when placed in the liquid
2. Smaller when placed in the liquid
3. To disappear when placed in the liquid
4. To reappear when placed in the liquid

\_\_\_\_\_\_11. If the refractive indexes of several different liquids are known, the

1. Submersion method can be used to estimate the refractive index of the glass
2. Submersion method can be used to estimate the reflective index of the glass
3. Reflective method can be used to estimate the refractive index of the glass
4. Reflective method can be used to estimate the submersion index of the glass

\_\_\_\_\_\_12. If the refractive index of the liquid medium is different than the refractive index of the piece of glass, a halo-like ring appears around the edge of the glass. This halo-like effect is called a

1. Becke quotient
2. Becke edge
3. Becke line
4. Becker edge

\_\_\_\_\_\_13. While photographing and recording tool mark evidence, the expert searches the surface of the tool mark for bits of foreign material using

1. Digital imaging
2. Oblique lighting
3. An electron microscope
4. None of the above

\_\_\_\_\_\_14. The dual-theory of light explains that light behaves like

1. A fire and a flashlight
2. A candle and a light bulb
3. A particle and a wave
4. An electron and a photon

\_\_\_\_\_\_15. What causes the emission of light?

1. A photon moving down an energy level, hitting an electron
2. A wave of light
3. An energized electron moving down an energy level, hitting a photon
4. None of the above

\_\_\_\_\_\_16. Which of the following are properties of light and describe light behavior?

1. Emission
2. Absorption
3. Intensity
4. All of the above

\_\_\_\_\_\_17. Dispersion is when white light passes through a prism and is

1. Broken up into its individual wavelengths/frequencies
2. Broken up according to wave speed
3. A property related to interaction and refraction
4. Both a and c

\_\_\_\_\_\_18. What property of light does a spectrophotometer use?

1. Refractive Index
2. Dispersion
3. Intensity
4. None of the above

\_\_\_\_\_\_19. What do a compound microscope, a magnifying glass, and a camera all have in common?

1. The use of convex lenses to magnify small objects for observation
2. The use of concave lenses to magnify large objects for observation
3. The use of convex lenses to magnify small objects for observation and/or concave lenses to bring large object into focus
4. None of the above