Scientific Foundations of Photography

Photography · Practice Test · 12 Questions

1. What fundamental optical principle governs the formation of an image in a camera lens?

A) Diffraction
B) Refraction
C) Interference
D) Polarization

2. In film photography, what chemical compound is primarily responsible for capturing light and forming a latent image?

A) Silver halide crystals
B) Potassium dichromate
C) Gelatin
D) Carbon black

3. The 'inverse square law' in photography relates to the intensity of light and its distance from the source. What does it state?

A) Light intensity doubles with every foot of distance.
B) Light intensity is inversely proportional to the square of the distance.
C) Light intensity is directly proportional to the distance.
D) Light intensity remains constant regardless of distance.

4. What is the scientific term for the phenomenon where light bends as it passes from one medium to another, such as from air to glass?

A) Reflection
B) Dispersion
C) Refraction
D) Diffraction

5. In digital photography, what sensor technology converts light photons into electrical signals?

A) Charge-Coupled Device (CCD)
B) Light Emitting Diode (LED)
C) Resistor-Capacitor (RC) circuit
D) Diode-Transistor Logic (DTL)

6. What primary scientific principle explains why different wavelengths of light produce different colors?

A) The Doppler effect
B) The photoelectric effect
C) Quantum entanglement
D) Electromagnetic spectrum

7. The 'reciprocity law' in photography describes the relationship between exposure time and aperture. What does it state?

A) Exposure time and aperture are independent variables.
B) The product of exposure time and aperture is constant for a given exposure.
C) Exposure time is always half the aperture value.
D) Aperture is always twice the exposure time.

8. What is the physical property of light that determines its 'brightness' or luminous intensity?

A) Wavelength
B) Frequency
C) Amplitude
D) Photon energy

9. In the context of digital imaging, what does the term 'bit depth' refer to?

A) The physical size of the image sensor.
B) The number of pixels in the image.
C) The range of colors or tonal values each pixel can represent.
D) The compression ratio of the image file.

10. What scientific phenomenon is responsible for the phenomenon of chromatic aberration in lenses, where different colors of light are focused at different points?

A) Reflection
B) Dispersion
C) Diffraction
D) Polarization

11. The 'persistence of vision' is a concept often discussed in relation to motion and photography. What is its scientific basis?

A) The brain processes visual information instantaneously.
B) The image of an object remains on the retina for a fraction of a second after the object is removed.
C) The eyes automatically adjust focus in low light.
D) Light travels at a finite speed.

12. What is the scientific principle behind the functioning of a 'pinhole camera', which forms an image without a lens?

A) Reflection of light from a curved surface.
B) Refraction of light through a medium.
C) Rectilinear propagation of light.
D) Diffraction of light around an aperture.