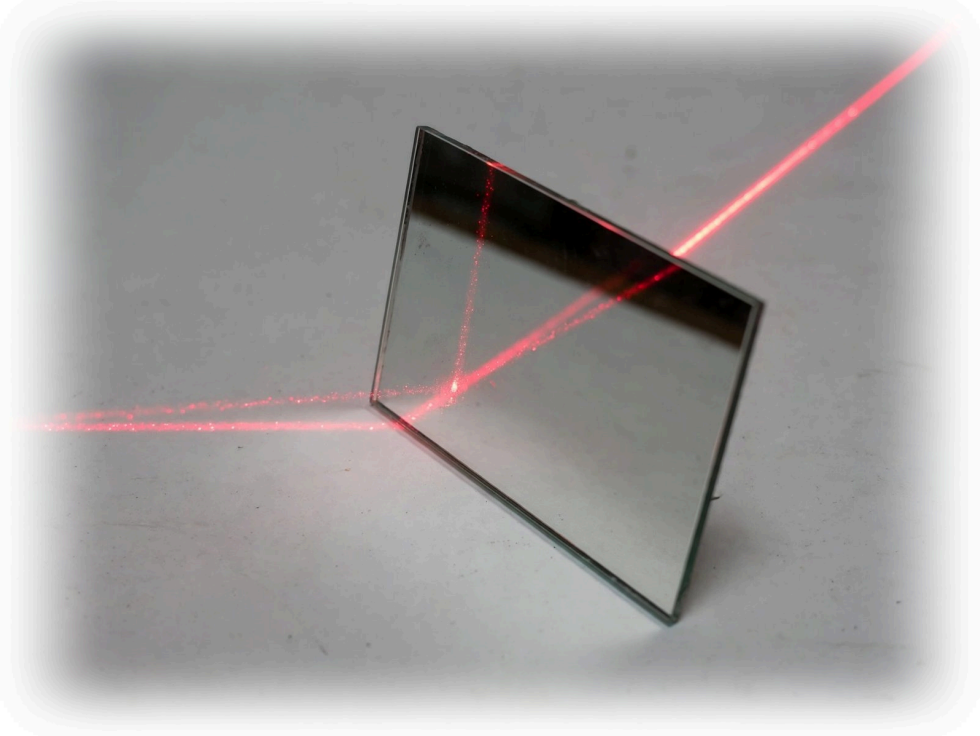
ARKANSAS PHYSICS · UNIT 4 · 25 QUESTIONS

Light and Modern Physics — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **A light ray hits a plane mirror at an angle of incidence of 35 degrees What is the angle between the incoming ray and the reflected ray?**



A 17.5 degrees

B 55 degrees

C 35 degrees

D 70 degrees

Understand It with Pulse

Flag a mistake

2 **Light passes from air into water and slows down The ray bends**

A Away from the normal

B Back along its path

C Not at all

D Toward the normal

Understand It with Pulse | Flag a mistake

3 **A plane mirror forms an image that is**

A The same size and virtual

B Smaller and real

C Larger and real

D Upside down and real

Understand It with Pulse | Flag a mistake

4 **An object 2 centimeters tall forms an image 6 centimeters tall The magnification is**

- A 2
- B 3
- C 4
- D 12

Understand It with Pulse | Flag a mistake

5 **The speed of light in a material is 200000 kilometers per second The speed of light in a vacuum is 300000 kilometers per second The refractive index of the material is**

- A 0.67
- B 2.5
- C 1.5
- D 50000

Understand It with Pulse | Flag a mistake

6 **A lens has a focal length of 0.5 meters Its power is $\frac{1}{0}$.5 diopters Its power is**

- A 0.5 diopters
- B 5 diopters
- C 20 diopters
- D 2 diopters

Understand It with Pulse | Flag a mistake

7 **Photon energy increases when the frequency of the light**

- A Increases
- B Decreases
- C Stays the same
- D Becomes zero

Understand It with Pulse | Flag a mistake

8 **In the photoelectric effect, increasing the intensity of light above the threshold mainly increases the**

- A Energy of each electron
- B Number of electrons emitted per second
- C Threshold frequency
- D Wavelength

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9 **In the photoelectric effect, the maximum kinetic energy of emitted electrons depends mainly on the**

- A Intensity of the light
- B Size of the metal
- C Frequency of the light
- D Time of exposure

Understand It with Pulse | Flag a mistake

10 **An atom has 6 protons and 6 neutrons Its mass number is**

A 6

B 18

C 36

D 12

Understand It with Pulse | Flag a mistake

11 **Two atoms have the same number of protons but different numbers of neutrons They are**

A Isotopes

B Ions

C Isomers

D Allotropes

Understand It with Pulse | Flag a mistake

12 **A sample starts with 80 grams of a radioactive isotope After two half lives, the mass remaining is**

A 10 grams

B 20 grams

C 40 grams

D 60 grams

Understand It with Pulse | Flag a mistake

13 **An alpha particle consists of**

A 1 proton only

B 2 electrons

C 2 protons and 2 neutrons

D 1 neutron only

Understand It with Pulse | Flag a mistake

14 **In beta decay, a neutron changes into a proton and emits an**

A Alpha particle

B Proton

C Photon only

D Electron

Understand It with Pulse | Flag a mistake

15 **Gamma radiation has**

A No charge and no rest mass

B A positive charge

C A negative charge

D The mass of a proton

Understand It with Pulse | Flag a mistake

16 **Nuclear fission is the process in which a heavy nucleus**

A Joins with a light nucleus

B Splits into smaller nuclei

C Gains electrons

D Loses its protons only

Understand It with Pulse | Flag a mistake

17 **Nuclear fusion in the Sun joins light nuclei to form**

A Lighter nuclei and absorb mass

B Only photons

C Heavier nuclei and release energy

D Only neutrons

Understand It with Pulse | Flag a mistake

18 **The hydrogen spectrum consists of discrete lines because electrons in atoms have**

A Continuous energy levels

B No energy levels

C Only kinetic energy

D Discrete energy levels

Understand It with Pulse | Flag a mistake

19 **Light shows both wave and particle behavior This is called wave particle**

A Duality

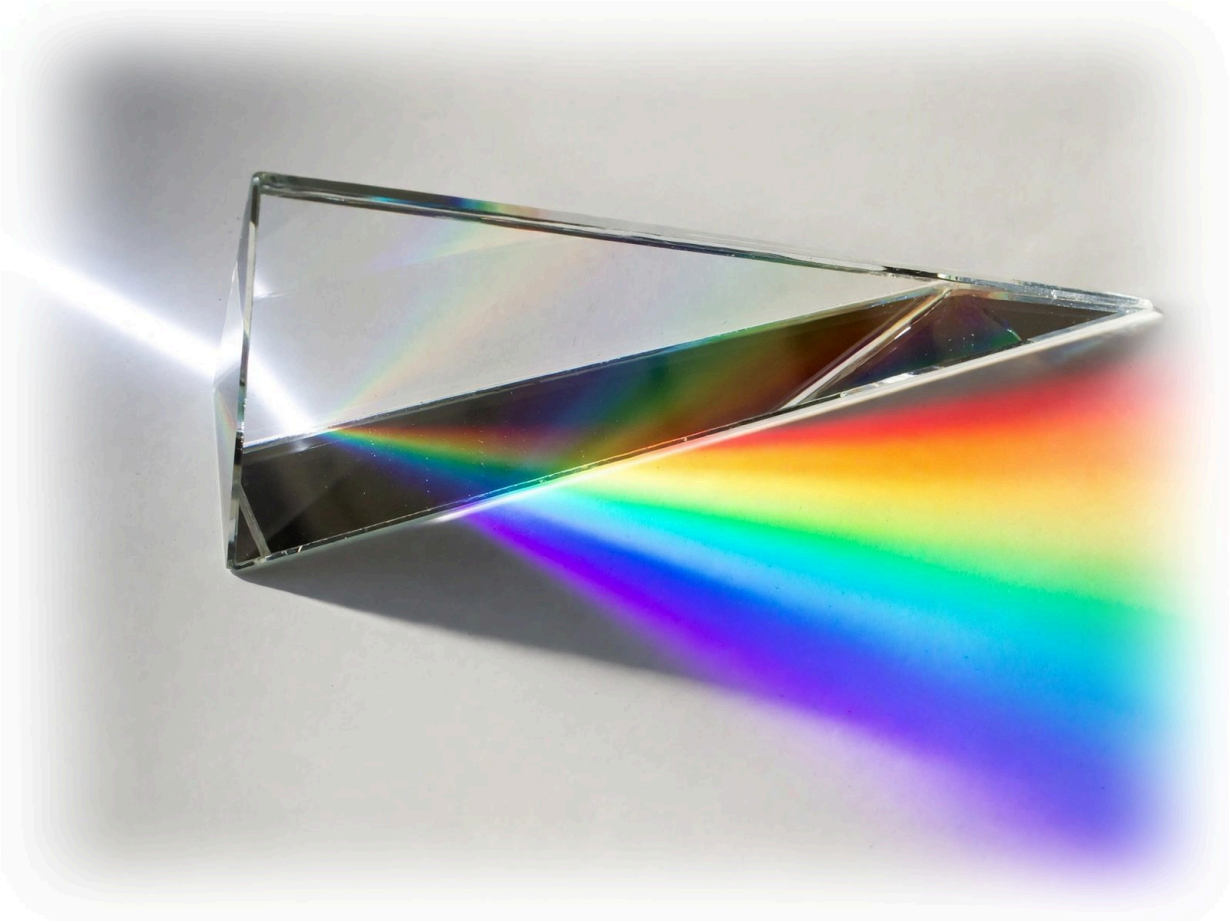
B Reflection

C Refraction

D Diffraction

Understand It with Pulse | Flag a mistake

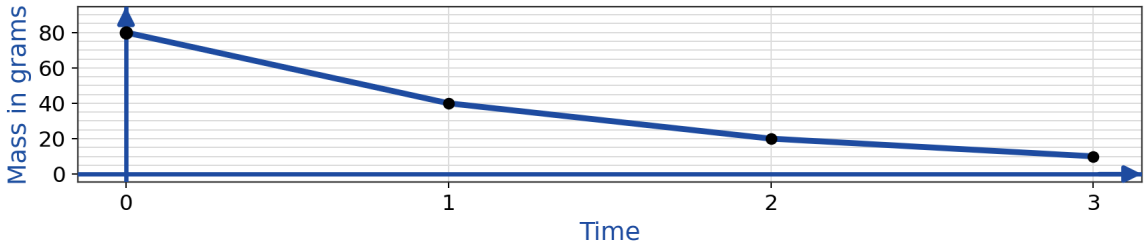
20 **When white light passes through a prism it spreads into colors because different colors**



- **A** Travel at the same speed in glass
- **B** Refract by different amounts
- **C** Have the same wavelength
- **D** Are absorbed equally

Understand It with Pulse | Flag a mistake

21 **The graph shows the mass of a radioactive sample against time The sample starts at 80 grams and falls to 40 grams after 1 time unit The half life is**



A 0.5 time units

B 2 time units

C 1 time unit

D 4 time units

Understand It with Pulse | Flag a mistake

22 **Total internal reflection can occur when light travels from a denser material to a**

A Denser material

B Vacuum only

C Mirror only

D Less dense material

Understand It with Pulse | Flag a mistake

23 **A converging lens can form a real image because it**

A Brings parallel rays to a focus

B Spreads rays apart

C Reflects all rays

D Absorbs all rays

Understand It with Pulse | Flag a mistake

24 **A sample starts with 160 grams of a radioactive isotope After three half lives, how many grams remain**

ANSWER

Understand It with Pulse | Flag a mistake

25 **An object 3 centimeters tall seen through a magnifying glass forms an image 12 centimeters tall What is the magnification**



ANSWER

Understand It with Pulse | Flag a mistake

ANSWER KEY

1. C
2. D
3. A
4. B
5. C
6. D
7. A
8. B
9. C
10. D
11. A
12. B
13. C
14. D
15. A
16. B
17. C
18. D
19. A
20. B
21. C
22. D
23. A
24. 20
25. 4

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