Physics

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Attempted MCQs 0/35   ↻

1) Which of the following light has highest momentum?

A) Blue   C) Yellow

B) Violet   D) Red

○ A   ○ B   ○ C   ○ D

2) If energy of a photon A is twice the energy of photon B,

then ratio of their momenta $\dfrac{p_A}{p_B} =$

A) 2   C) 4

B) $\dfrac{1}{2}$ D) $\dfrac{1}{4}$

○ A   ○ B   ○ C   ○ D

3) Which of the following properties, the photon does not possess:

A) Rest mass   C) Momentum

B) Energy   D) Frequency

○ A   ○ B   ○ C   ○ D

4) The energy of a photon of frequency f is given by E= hf, where h is Plank's constant. The momentum of a

photon of wavelength λ is $p = \dfrac{h}{\lambda}$. Then we may

conclude that velocity of light is equal to:

A) $\left(\dfrac{E}{p}\right)^{\frac{1}{2}}$ C) Ep

B) $\left(\dfrac{E}{p}\right)$ D) $\left(\dfrac{E}{p}\right)^{2}$

○ A   ○ B   ○ C   ○ D

5) If the value of h is 6.6×10^{-34} J s, the energy of a

quantum of frequency 10^{15} Hz will be:

A) 6.6×10^{-19} J

C) 6.6×10^{-49} J

B) 6.6×10^{-12} J

D) 6.6×10^{-41} J

○ A   ○ B   ○ C   ○ D

6) **If stopping potential is 3 volts. The maximum K.E of photoelectron is:**

A) 1.6×10^{-19} J

C) 4.8×10^{-19} J

B) 3.2×10^{-19} J

D) 6.4×10^{-19} J

○ A   ○ B   ○ C   ○ D

7) **K.E$_{max}$ of photoelectrons depends upon.**

A) Intensity of light

C) Energy of light

B) Frequency of light

D) Both B and C

○ A   ○ B   ○ C   ○ D

8) **If work function for a surface is $\dfrac{h}{2}$ then photoelectric threshold frequency is (where h is plank's constant)**

A) 1 Hz

C) 1.5 Hz

B) 0.5 Hz

D) 2 Hz

○ A   ○ B   ○ C   ○ D

9) **Which cathode material emits photoelectrons for white light?**

A) Potassium cathode

B) Cesium coated oxidized silver cathode

C) Both A and B

D) Aluminum cathode

○ A   ○ B   ○ C   ○ D

10) **A brighter light as compared to a dimmer light of same colour will eject:**

A) More number of electrons C) Electrons of greater K.E

B) Less number of electrons D) Electrons of lesser K.E

○ A   ○ B   ○ C   ○ D

11) **The mass of moving photon is:**

A) $\dfrac{h}{\lambda c}$

C) Zero

B) $\dfrac{hc}{\lambda}$

D) $\dfrac{hf}{\lambda}$

○ A   ○ B   ○ C   ○ D

12) Which of the following equation represent Einstein's equation of photoelectric effect K.E $_{max}$=?

A) hf

C) hf$_o$

B) h(f+f$_o$)

D) h(f-f$_o$)

○ A   ○ B   ○ C   ○ D

13) On increasing the frequency of incident light in photoelectric effect:

A) Photoelectric current decrease

B) Photoelectric current increases

C) Stopping potential increases

D) Stopping potential decreases

○ A   ○ B   ○ C   ○ D

14) If a photon of energy 5.2 eV strikes a metal surface of work function 4 eV, then maximum K.E. of photoelectrons is.

A) 9.2 eV

C) 4.2 eV

B) 1.5 eV

D) 1.2 eV

○ A   ○ B   ○ C   ○ D

15) The slope of the graph between K.E$_{max}$ of photoelectrons and frequency of incident light gives units of:

A) h

C) $\dfrac{e}{h}$

B) $\dfrac{h}{e}$

D) he

○ A   ○ B   ○ C   ○ D

16) When light of wavelength 100 nm falls on a metal, photoelectrons are ejected. If another light of 200 nm is sufficient for photoemission from another metal, then ratio of work function of two metals is:

A) 1:2

C) 2:1

B) 4:1

D) 1:4

○ A   ○ B   ○ C   ○ D

17) A source of light is placed at a distance of 10 cm from photocell and stopping potential is V$_o$ if source is now placed at 20 cm then stopping potential will become:

A) $\dfrac{V_o}{2}$

C) $\dfrac{V_o}{4}$

B) $2V_o$

D) V_o

○ A   ○ B   ○ C   ○ D

18) During Compton Effect, the wavelength of scattered photon is:

A) Greater than incident photon

B) Lesser than incident photon

C) Equal to incident photon

D) Sometimes greater and sometimes smaller than incident photon.

○ A   ○ B   ○ C   ○ D

19) Compton shift in wavelength of X-rays photon will be minimum when scattering angle of photon $\theta=$____.

A) 0°

B) 90°

C) 180°

D) 45°

○ A   ○ B   ○ C   ○ D

20) Which of these effects is caused by $\gamma-ray$ photons?

A) Photoelectric effect

B) Compton effect

C) Pair production

D) Annihilation of matter

○ A   ○ B   ○ C   ○ D

21) The heavy nucleus in pair production conserves:

A) Charge

B) Energy

C) Momentum

D) Energy and momentum

○ A   ○ B   ○ C   ○ D

22) For pair production, hf:

A) Should be greater than m_oc^2

B) Should be greater than $\frac{1}{2}m_o c^2$

C) Should be greater than $2m_oc^2$

D) Should be less than $\frac{1}{2}m_o c^2$

○ A   ○ B   ○ C   ○ D

23) Compton shift in wavelength depends upon:

A) Wavelength of incident photon

B) Mass of electron

C) Scattering angle of photon

D) All of these

○ A   ○ B   ○ C   ○ D

24) Compton's effect is typically given by:

A) $\gamma-rays$

B) X-rays

C) Ultraviolet

D) Infrared

○ A   ○ B   ○ C   ○ D

25) Units of $\frac{h}{m.c}$ are:

A) m

B) s

C) m^{-1}

D) s^{-1}

○ A   ○ B   ○ C   ○ D

26) Compton's shift is equal to Compton's wavelength at scattering angle of:

A) 0°

B) 90°

C) 180°

D) 45°

○ A   ○ B   ○ C   ○ D

27) The photon in a radio wave of wavelength 3×10^8 cm has an energy:

A) 6.63×10^{-30} J

C) 6.63×10^{-36} J

B) 6.63×10^{-32} J   D) 6.63×10^{-28} J

○ A   ○ B   ○ C   ○ D

28) Electrons are emitted when a beam of red light falls on cathode of photocell. If the red-light beam is replaced by a blue light beam of same power, which of the following quantity would decrease?
A) The work function of cathode
B) The maximum K.E of electrons emitted
C) The number of photons striking the cathode per unit time
D) The energy of each photon striking the cathode

○ A   ○ B   ○ C   ○ D

29) If U.V light rays are failed to emit photoelectrons from a metal, then which of the following light can be used for the possibility of emitting the electrons from that metal?
A) Visible   C) Infrared
B) Microwaves   D) X-rays

○ A   ○ B   ○ C   ○ D

30) The threshold wavelength for a metal whose work function is 2 eV is:
A) 310 nm   C) 1240 nm
B) 620 nm   D) 2480 nm

○ A   ○ B   ○ C   ○ D

31) Two light beams of same intensities and same energies are incident on two different metals with work functions "$\phi_2=2\phi_1$". Which of the following correctly describes the characteristic curves of photoelectric currents $\left(I_{P_1}, I_{P_2}\right)$ versus applied voltage for the given two metals.:
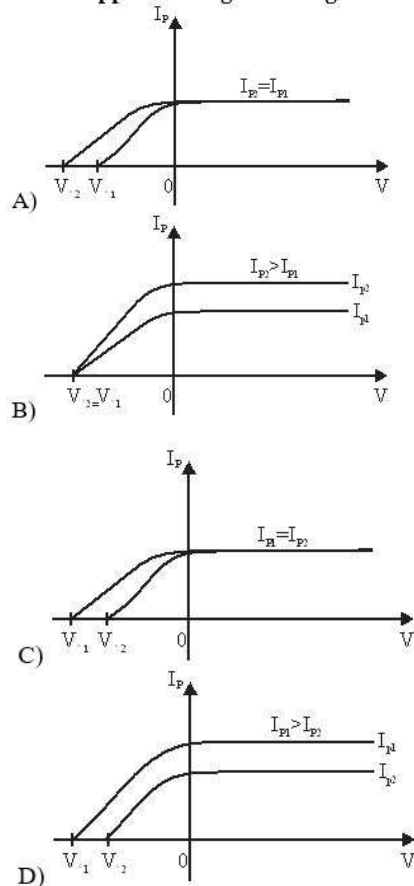
A)

B)

C)

D)

32) The amount of energy required to remove the least tightly bound electron from a metal is "2.5 eV." When a photon of some energy is incident on that metal, electrons with K.Es ranging from "0" to 1.7 eV are emitted. The energy of incident photon is:

A) 0.8 eV   C) 3.7 eV
B) 4.2 eV   D) 1.9 eV

○ A   ○ B   ○ C   ○ D

33) Photoelectrons are emitted by a metal when photons of wavelength 410 nm are incident. If the K.E of the emitted electrons is to be increased, then:

A) The intensity of radiation should be increased
B) The wavelength of radiation should be increased
C) The wavelength of radiation should be decreased
D) The intensity of radiation should be decreased

○ A   ○ B   ○ C   ○ D

34) The work function of a metal is 3.3 eV. The threshold frequency of that metal will be:

A) 8×10^{14} Hz   C) 4×10^{14} Hz
B) 5×10^{20} Hz   D) 2×10^{20} Hz

○ A   ○ B   ○ C   ○ D

35) The work function of a metal is 7.7 eV and photons of energy 22.5 eV are incident on metal surface, then the stopping potential is:

A) 15 eV   C) 13.6 V
B) 14.8 eV   D) 14.8 V

○ A   ○ B   ○ C   ○ D

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