PHYSICS

AAKASH INSTITUTE ENGLISH

Mock Test 38: PHYSICS

Example

1. The work function of material (in eV), whose threshold frequency is6×10^{14} Hz would be

A. 5.48 eV

B. 3.48 eV

C. 2.48 eV

D. 8.48 eV

Answer: C

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2. The energy (E) and momentum (p) of photon are respectively, (symbols have their usual meaning)

A. $E = hc, p = \frac{v}{c}$

B. $E = hv, p = h\frac{v}{c}$

C. $E = \frac{c}{v}, p = \frac{h}{c}$

D.

Answer: B

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3. The de-Broglie wavelength of an electron accelerated by and electric potential of V volts is given by:

A. $\lambda = \frac{12.27}{\sqrt{}} vcm$

B. $\lambda = \frac{12.27}{\sqrt{}} vmm$

C. $\lambda = \frac{12.27}{\sqrt{}} vcm$

D. $\lambda = \frac{12.27}{\sqrt{}} vA$

Answer: D

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4. On increasing the temperature the work function of metal will

A. Increase

B. Decrease

C. Remains same

D. First increase and then decrease

Answer: B

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5. Find the ratio of de Broglie wavelength of a proton and as α-particle which have been

accelerated through same potential difference.

A. $1:2$

B. $1:1$

C. $1:2\sqrt{2}$

D. $1:4$

Answer: C

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6. In the davisson- German experiment, if the scattering angle is 60^{o}, then glancing angle is equal to

A. 30^{o}

B. 45^{o}

C. 60^{o}

D. 90^{o}

Answer: C

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7. According to Einstein's photoelectric equation (symbols have their usual meaning)

A. $hv - \phi = (KE)_{\max}$

B. $hv > (KE)_{\max}$

C. $\phi = hv + \frac{(KE)_{\max}}{2}$

D. $\phi = (KE)_{\max} - \frac{hv}{2}$

Answer: A

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8. In photoelectric effect experiment, the slope of the graph of the stopping potential versus frequency gives the value of :

A. h

B. $\frac{h}{e}$

C. he

D. $\frac{h^2}{e}$

Answer: B

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9. Explain photoelectric effect Explain the effect of increase of intensity of incident radiations on photoelectrons emitted by a photo-tube.

A. increases

B. decreases

C. remains constant

D. first decrease and then increase constant

Answer: A

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10. Find the maximum velocity of an electron emitted by light of wavelength λ incident on the surface of a metal of work function ϕ.

A. $v = \left[2m_e \frac{\lambda}{hc - \lambda\phi}\right]^{12}$

B. $v = \left[2h \frac{c}{m_e\lambda - \phi}\right]^{12}$

C. $v = \left[m_e \frac{\lambda}{hc + \lambda\phi}\right]^{12}$

D. $v = \left[2 \frac{hc - \lambda\phi}{m_e\lambda}\right]^{12}$

Answer: D

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11. The De-Brogli wave is

A. a mechanical wave

B. An electromagnetic wave

C. neither mechanical wave nor electromagnetic wave

D. both (1) & (2)

Answer: C

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12. The work function of two metals metal A and metal B are 6.5 eV and 4.5 eV respectively. If the threshold wavelength of metal A is 2500 A, the threshold wavelength on metal B will be approximately equal to

A. 3611A

B. 3500 A

C. 6332 A

D. 4321 A

Answer: A

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13. The wave like character is significant and measurable for

A. macroscopic objects only

B. sub-atomic particles

C. both macroscopic objects and sub-atomic particles

D. heavy and more energetic particles

Answer: B

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14. If the material particle is moving with velocity v and the velocity of light is c, then mass of particle is taken as (m_0 is rest mass)

A. $m = \frac{m_0}{c}$

B. $m = \frac{m_0}{\sqrt{\left(1 - \frac{v^2}{c^2}\right)}}$

C. $m = m_0 \sqrt{\left(1 + \frac{v^2}{c^2}\right)}$

D. $m = \frac{m_0}{\sqrt{\left(1 + \frac{v^2}{c^2}\right)}}$

Answer: B

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15. The material having minimum work function is

A. copper

B. silver

C. gold

D. cesium

Answer: D

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16. The ionisation energy of electron (E) is second orbit of hydrogen atom is

A. -13.6 eV

B. -3.4 eV

C. +3.4 eV

D. zero

Answer: C

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17. The minimum energy needed to separate the constituent of nucieons system is known as

A. ionisation energy

B. binding energy

C. excitation energy

D. kinetic energy

Answer: B

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18. calculate the longest wavelength in Balmer series and the series limit . (Given $R = 1.097 \times 10^7 m^{-1}$)

A. 6000 A

B. 6563 A

C. 7200 A

D. 7383 A

Answer: B

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19. In alpha-particle scattering experiment, the expression of distance of closest approach (r_0)is (symbols have their usual meanings)

A. $\frac{Ze^2 \sin^2\left(\frac{\theta}{2}\right)}{4\pi\varepsilon_0 E}$

B. $\frac{Ze^2 \cot\left(\frac{\theta}{2}\right)}{4\pi\varepsilon_0 E}$

C. $\frac{Ze^2 \cos\left(\frac{\theta}{2}\right)}{4\pi\varepsilon_0 E}$

D. $\frac{Z^2 e^2 E}{\sin^4\left(\frac{\theta}{2}\right) 4\pi\varepsilon_0}$

Answer: B

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20. The total energy (E) of the electron is an orbit of radius r in hydrogen atom is

A. $\frac{e^2}{8\pi\varepsilon_0 r}$

B. $-\frac{e^2}{4\pi\varepsilon_0 r}$

C. $-\frac{e^2}{8\pi\varepsilon_0 r}$

D. zero

Answer: C

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21. According to Bohr's theory the possible value of angular momentum of an electron orbiting in hydrogen atom is

A. $\frac{4h}{3\pi}$

B. $\frac{h}{\pi}$

C. $\frac{4h}{5\pi}$

D. both (1) & (3)

Answer: B

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22. For hydrogen atom, energy of nth level is given by

A. $E_n = -\left(\frac{13.6}{n}\right)eV$

B. $E_n = +\left(\frac{13.6}{n}\right)eV$

C. $E_n = \left(\frac{13.6}{n^2}\right)eV$

D. $E_n = -\left(\frac{13.6}{n^2}\right)eV$

Answer: D

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23. Calculate the value of Rydberg's constant.

A. $1.097 \times 10^{7} m^{-1}$

B. $8.85 \times 10^{-12} m^{-1}$

C. $1.6 \times 10^{-19} m^{-1}$

D. $6.63 \times 10^{-34} m^{-1}$

Answer: A

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24. The ratio of the velocity of electron in 3rd and 5th orbit of hydrogen atom is

A. $5:3$

B. $1:3$

C. $5:1$

D. $1:1$

Answer: A

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25. According to Rutherford, which force was responsible for centripetal acceleration of an electron revolving around the nucleus?

A. gravitational force

B. weak nuclear force

C. strong nuclear force

D. electrostatic force

Answer: D

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26. In x-ray spectra, the K_γ lines in k series corresponds to

A. The vacancy created in K-shell being filled by an electron from L-shell

B. The vacancy created in L-shell being filled by an electron from M-shell

C. The vacancy created in L-shell being filled by an electron from K-shell

D. The vacancy created in K-shell being filled by an electron from N-shell

Answer: D

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27. Total energy of an electron in an atom is negative. What does it signify?

A. electron is bound to nucleus

B. the force between electron and nucleus is attractive or repulsive

C. the centripetal force provided for revolution is provided by electrostatic force of attraction

D. both (1) & (2)

Answer: A

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28. In alpha-particle scattering experiment, the expression of distance of closest approach (r_0)is (symbols have their usual meanings)

A. $\frac{1}{4\pi\varepsilon_0 E} \times \frac{Ze^2}{E}$

B. $\frac{1}{4\pi\varepsilon_0} \times \frac{2Ze^2}{E}$

C. $\frac{1}{4\pi\varepsilon_0} \times \left(Z^2e^2\right)$

D. $\frac{1}{4\pi\varepsilon_0} \times \frac{Z^2e^4}{E}$

Answer: B

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29. In Lyman series the wavelength lambda of emitted radiation is given by (R is rydberg constant)

A. $\frac{1}{\lambda} = R\left(\frac{1}{2^2} - \frac{1}{n^2}\right), n = 3, 4, 5, \ldots\ldots$

B. $\frac{1}{\lambda} = R\left(\frac{1}{3^2} - \frac{1}{n^2}\right), n = 4, 5, 6, \ldots\ldots$

C. $\frac{1}{\lambda} = R\left(\frac{1}{1^2} - \frac{1}{n^2}\right), n = 2, 3, \ldots$

D. $\frac{1}{\lambda} = R\left(\frac{1}{4^2} - \frac{1}{n^2}\right), n = 5, 6, 7, \ldots$

Answer: C

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