Unit 14 - Week 12

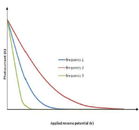
Assignment 12

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-10-23, 23:59 IST.

1) In studying the photo electric effect, the following graph is obtained for three different frequencies ν_1 (frequency-1), ν_2 ((frequency-2) and ν_3 (frequency-3) with intensity of light kept constant. Now chose the correct option

1 point



(a) frequency-1> frequency-2> frequency-3

(b) frequency-2 > frequency-1> frequency-3

(c) frequency-1> frequency-2= frequency-3

(d) frequency-3> frequency-1> frequency-2

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
b

2) When UV light incident on a Zinc metal surface, few electrons are emitted. The phenomenon is called

1 point

(a)Thermal emission

(b)Compton effect

(c) Photovoltaic effect

(d) Photoelectric effect

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
d

3) The phenomenon 'Photoelectric effect' was first observed by Heinrich Hertz. The man who gave the correct explanation for the same was

1 point

(a) Einstein

(b) Max Plank

(c) Heinrich Hertz

(d) Isaac Newton

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
a

4) The fundamental theory which could explain Photoelectric effect is

1 point

(a) Classical theory

(b) Quantum Theory

(c) Wave theory

(d) Corpuscular theory

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
b

5) Which among the following is true in the case of Photoelectric effect

1 point

(a) It is not an instantaneous phenomenon

(b) The photo current is independent of the intensity of incident light

(c) The kinetic energy of photo electrons increases with the frequency of incident radiation

(d) The photo current depends on frequency of incident radiation

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
c

6) In a photoelectric experiment, ultraviolet light of wavelength 310 nm falls on the photo cathode with work function 2.1 eV. The stopping potential should be closed to:

1 point

(a) 1.9 V

(b) 1.6 V

(c) 2.2 V

(d) 2.4 V

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
a

7) A beam of light of 400 nm and of power 1.55 m watt is directed at the cathode of a photoelectric cell (Given hc = 1240 eVnm , e =1.6×10^{-19} C). If only 10% of the incident photons effectively produce photoelectrons, find the current due to these electrons.

1 point

(a) 5 mA

(b) 50 μA

(c) 5 μA

(d) 5 A

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
b

8) If the photo electric work function is Φ eV, the threshold wave length is:

1 point

(a) eΦ/h

(b) hc/eΦ

(c) h/Φ

(d) hc/Φ

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
b

9) A metallic surface is irradiated by monochromatic light of frequency $\nu_1$and stopping potential is found to be V_1. If light of frequency ν_2 irradiates the surface, the stopping potential will be:

1 point

(a) $V_1 + (h/e) (\nu_1 + \nu_2)$

(b) $V_1 + (h/e) (\nu_1 - \nu_2)$

(c) $V_1 + (e/h) (\nu_1 - \nu_2)$

(d) $V_1 - (h/e) (\nu_1 + \nu_2)$

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
b

10) The photoelectric work function of a surface is 2.2 eV. The maximum kinetic energy of photo electrons emitted when light of wave length 6200 A.U. is incident on the surface is:

1 point

(a) 1.6 eV

(b) 1.4 eV

(c) 1.2 eV

(d) Photo electrons are not emitted

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
d

11) The retarding potential required to stop the emission of photoelectrons when a photosensitive material of work function 1.2 eV is irradiated with ultraviolet rays of wave length 2000 A.U. is:

1 point

(a) 4V

(b) 5V

(c) 6V

(d) 8V

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
b

12) The energy of an electron in excited hydrogen atom is -3.4 eV. Then, according to Bohr's theory, the angular momentum of the electron in Js is:

1 point

(a) 2.11×10^{-34}

(b) 3×10^{-34}

(c) 3.5×10^{-34}

(d) 0.5×10^{-34}

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
a

13) Singly ionized helium (He+) atom is hydrogen like in the sense that a solitary electron revolves around a positively charged nucleus. If the energy of this electron in its first orbit (n = 1) is −54.4 eV, what will be its energy in the first excited state?

1 point

(a) −108.8 eV

(b) −27.2 eV

(c) −13.6 eV

(d) −6.8 eV

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
c

14) In a mixture of H − He+ gas (He+ is singly ionized He atom) H atoms and He+ ions are excited to their respective first excited states. Subsequently, H atoms transfer their total excitation energy to He+ ions (by collisions). Assume that the Bohr model of atom is exactly valid.

The quantum number n of the state finally populated in He+ ions is

1 point

(a) 2

(b) 3

(c) 4

(d) 5

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
c

15) Which state of the triply ionised Be+++ has the same orbital radius (for the electron) as that of the hydrogen atom in the ground state?

1 point

(a) First excited state

(b) Second excited state

(c) Third excited state

(d) Fourth excited state

a
b
c
d

No, the answer is incorrect.
Score: 0
Accepted Answers:
a