RADIATION AND MATTER DUAL NATURE

1)Which photon is more energetic: A red one or a violet one?
a) Both
b) Red
c) Violet
d) Neither

2. If the wavelength of electromagnetic radiation is doubled, what will happen to the energy of photons?
a) Remains the same
b) Doubled
c) Halved
d) Infinite

3. What happens to the wavelength of a photon after it collides with an electron?
a) Increases
b) Decreases
c) Remains the same
d) Infinite

4. Why are alkali metals most suited as photo-sensitive metals?
a) High frequency
b) Zero rest mass
c) High work function
d) Low work function

5. Which radiations will be most effective for the emission of electrons from a metallic surface?
a) Microwaves
b) X rays
c) Ultraviolet
d) Infrared

6. Photoelectric emission is possible at all frequencies.
a) True
b) False

7. Two beams, one of red light and the other of blue light, of the same intensity are incident on a metallic surface to emit photoelectrons. Which emits electrons of greater frequency?
a) Both

b) Red light
c) Blue light
d) Neither

8. If the intensity of incident radiation in a photo-cell is increased, how does the stopping potential vary?
a) Increases
b) Remains the same
c) Decreases
d) Infinite

9. If the frequency of the incident radiation is equal to the threshold frequency, what will be the value of the stopping potential?
a) 0
b) Infinite
c) 180 V
d) 1220 V

10. How does retarding potential vary with the frequency of light causing photoelectric effect?
a) Infinite
b) Zero
c) Decreases
d) Increases

11. If the intensity of the radiation incident on a photo-sensitive plate is doubled, how does the stopping potential change?
a) Increases
b) Decreases
c) No effect
d) Infinite
12. The stopping potential in photoelectric emission does not depend upon the frequency of the incident radiation.
a) True
b) False
13. The maximum kinetic energy of a photoelectron is 3 eV. What is the stopping potential?
a) 0 V
b) 3 V
c) 9 V
d) 12 V

14. The stopping potential in an experiment on the photoelectric effect is 1.5 V. What is the maximum kinetic energy of the photoelectrons emitted?

a) 1.5 eV
b) 3 eV
c) 4.5 eV
d) 6 eV

15. What is the frequency of a photon whose energy is 66.3 eV?
a) 12.6×10^{16} Hz
b) 91.6×10^{16} Hz
c) 1.6×10^{16} Hz
d) 81.6×10^{16} Hz

16. Calculate the energy of a photon of wavelength 6600 angstroms.
a) 0.3×10^{-19} J
b) 3×10^{-19} J
c) 30×10^{-19} J
d) 300×10^{-19} J

17. Among the following four spectral regions, in which of them, the photon has the highest energy in?
a) Infrared
b) Violet
c) Red
d) Blue

18. What will be the photon energy for a wavelength of 5000 angstroms, if the energy of a photon corresponding to a wavelength of 7000 angstroms is 4.23×10^{-19} J?
a) 0.456 eV
b) 5.879 eV
c) 3.701 eV
d) 1.6×10^{-19} eV
19. Photons of energy 10.25 eV fall on the surface of the metal emitting photoelectrons of maximum kinetic energy 5.0 eV. What is the stopping voltage required for these electrons?
a) 10 V
b) 4 V
c) 8 V
d) 5 V

20. When a proton is accelerated through 1 V, then its kinetic energy will be 1 V.
a) True
b) False

ANSWERS-1.(C) 2.(C) 3.(A) 4.(D) 5.(C) 6.(B) 7.(C) 8.(B) 9.(A) 10.(D) 11.(C) 12.(B) 13.(A) 14.(C) 15.(B) 16.(B) 17.(C) 18.(D) 19.(B) 20.(B)