Exercise 1

Calculate the wavelength of a 2eV photon. ($1eV = 1.6 \times 10^{-19}$ J.)

(Ans. 620 nm)

Exercise 2

Assuming the sun to be a black body, calculate the number of photons emitted by the sun every second.

(Ans. 2.1×10^{45})

Exercise 3

The minimum energy required to remove an electron from a metal is 2.5 eV. What is the longest wavelength of radiation that can cause photoelectrons to be emitted from such a metal ?

(Ans. 495 nm)

Exercise 4

The work function of Potassium is 2 eV. If the surface of the metal is illuminated by a radiation of 360 nm, what will be (i) stopping potential, (ii) energy of the fastest photoelectron ?

(Ans. (i) 1.45 eV (ii) 1.45 V)

Exercise 5

The maximum kinetic energy emitted from the surface of a metal has a value equal to twice its work function. By what factor should the frequency of incident radiation be increased so that the kinetic energy is doubled ?

(Ans. 5/3)

Exercise 6

Radiation from a black body at a temperature of 500 K falls on a metal with a work function of 0.2 eV. Find the longest wavelength of the spectrum capable of releasing photoelectrons from the surface. What percentage of the total radiant energy of the black body contributes to the process ?

(Ans. 6.19 μm, 29%)