Question 1

Two light sources produce red light of exactly the same color, corresponding to wavelength $650\,\text{nm}$. Light source A produces 10000 photons every second and light source B produces 10 photons every second.

Which of the following is true?

1. The energy of each photon produced by A is the same as that of each photon produced by B.
2. The energy of each photon produced by A is 10000 times that of each photon produced by B.
3. The energy of each photon produced by A is 1000 times that of each photon produced by B.
4. The energy of each photon produced by A is less than that of each photon produced by B.

Question 2

A Xenon lamp equipped with a filter that transmits light of wavelength $400\,\mathrm{nm}$.

The power (total energy per second) emitted by the light is increased. Which of the following is true?

1. The energy of each photon is unchanged and the rate of photon emission is unchanged.
2. The energy of each photon is unchanged and the rate of photon emission increases.
3. The energy of each photon increases and the rate of photon emission is unchanged.
4. The energy of each photon increases and the rate of photon emission increases.