

## Question 1

Consider the following sources of light. Each produces light of one wavelength:

	<b>Wavelength</b>	<b>Power</b>
Source A	650 nm	10 W
Source B	650 nm	20 W
Source C	500 nm	10 W
Source D	500 nm	20 W

Which of the following best ranks these in terms of the energy per photon?

1.  $A = B > C = D$
2.  $A = B < C = D$
3.  $A = C > B = D$
4.  $A = C < B = D$

## Question 2

Visible light has wavelengths in the range 350 nm – 700 nm. Consider a source of light with wavelength 600 nm that produces power 1.0 W.

Which of following most closely represents the energy of a single photon of this light?

1.  $1 \times 10^{-19} \text{ J}$
2.  $1 \times 10^{-10} \text{ J}$
3.  $1 \times 10^{-5} \text{ J}$
4.  $1 \text{ J}$
5.  $1 \times 10^5 \text{ J}$
6.  $1 \times 10^{10} \text{ J}$

## Question 3

Consider the following sources of light. Each produces light of one frequency:

	Frequency	Power
Source A	$4.0 \times 10^{14}$ Hz	30 W
Source B	$8.0 \times 10^{14}$ Hz	15 W

Let  $N_A$  be the number of photons produced by A every second and similar  $N_B$  that produced by B every second. Which of the following is true?

1.  $N_A = \frac{1}{4} N_B$
2.  $N_A = \frac{1}{2} N_B$
3.  $N_A = N_B$
4.  $N_A = 2N_B$
5.  $N_A = 4N_B$