

## Quiz 1: Characteristics of Light

1. An electromagnetic wave consists of

- A. a transverse electric field and a longitudinal magnetic field.
- B. a longitudinal electric field and a transverse magnetic field.
- C. longitudinal electric and magnetic fields.
- D. transverse electric and magnetic fields.

2. In an electromagnetic wave, the electric and magnetic fields

- A. are parallel to each other.
- B. are at right angles to each other.
- C. have constant intensity.
- D. have different frequencies.

3. An electromagnetic wave has a frequency of  $2.73 \times 10^{14}$  Hz. To what part of the spectrum does it belong?

- A. microwaves
- B. infrared waves
- C. visible light
- D. ultraviolet light

4. High frequency electromagnetic waves tend to be absorbed by water. As a result, very low frequencies are used for communications with submarines. If the frequency used is  $1.0 \times 10^4$  Hz, calculate the wavelength of these radio waves.

- A.  $3.0 \times 10^4$  m
- B.  $3.0 \times 10^{12}$  m
- C.  $3.3 \times 10^{-2}$  m
- D.  $3.3 \times 10^{-4}$  m

5. A microwave oven uses radiation that has a wavelength of 12.5 cm. What is the frequency of those waves? Hint: convert units of cm to m.

- A.  $3.75 \times 10^7$  Hz
- B.  $4.17 \times 10^{-10}$  Hz
- C.  $2.40 \times 10^9$  Hz
- D.  $2.40 \times 10^7$  Hz