



Waves

2003

- 11** Three of the characteristic phenomena demonstrated by waves are reflection, refraction and diffraction.
How many of these phenomena cause the frequency of the wave to change?
- A** 0
B 1
C 2
D 3
- 19** The energy in joules (E) associated with a photon of radiation is related to its frequency in hertz (f) by the equation: $f = E/h$ where h is a constant (6.63×10^{-34}). What is the energy of a photon of radiation if 5 waves of this radiation are produced in 1×10^{-13} sec?
- A** 1.33×10^{-21} J
B 6.63×10^{-21} J
C 3.32×10^{-20} J
D 1.51×10^{46} J
E 7.54×10^{46} J



Waves

2006

7 The following statements can be applied to certain types of wave:

- 1 Their oscillations are longitudinal.
- 2 They travel at the speed of light in air.
- 3 They are used in pre-natal scanning.
- 4 They are used in thermal imaging.
- 5 They will not travel through a vacuum.

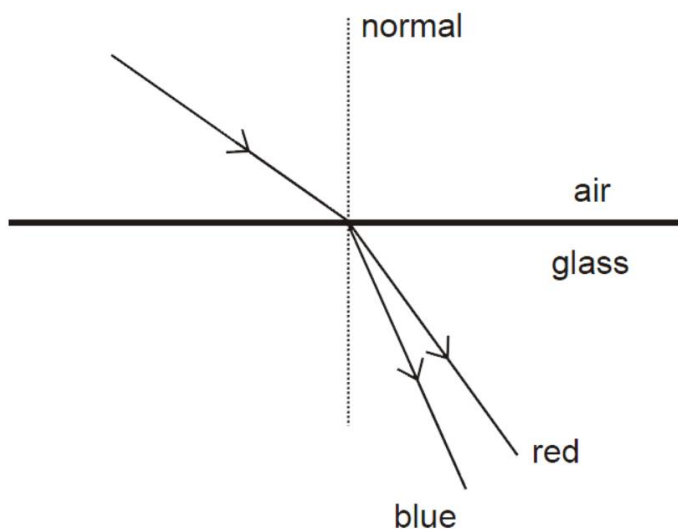
Which of these statements can be applied to microwaves?

- A 2 only
- B 4 only
- C 1 and 5 only
- D 2 and 4 only
- E 1, 3 and 5 only
- F 2, 3 and 4 only



Waves

23 The diagram shows the dispersion of white light as it passes from air into glass.



Red light travels at speed c in air, but only $2c/3$ in glass. Red light has a wavelength of λ in air.

What is the frequency of red light, and the speed of blue light in glass?

	frequency of red light in glass	speed of blue light in glass
A	$2c/3\lambda$	$< 2c/3$
B	$2c/3\lambda$	$> 2c/3$
C	c/λ	$< 2c/3$
D	c/λ	$> 2c/3$
E	$3c/2\lambda$	$< 2c/3$
F	$3c/2\lambda$	$> 2c/3$



Waves

2007

- 15 Which diagram shows how a ray of white light is refracted by an air bubble in water, and gives the correct relative positions of the red and violet light formed by dispersion?

