

8.2 Transverse Waves: EM Spectrum & Polarisation

Question Paper

Course	CIE A Level Physics (9702) 2019-2021
Section	8. Waves
Topic	8.2 Transverse Waves: EM Spectrum & Polarisation
Difficulty	Easy

Time allowed:

20

Score:

/13

Percentage:

/100

Question 1

Which of the following is the number of wavelengths in one metre of visible light?

- A 10^4 B 10^6 C 10^8 D 10^{10}

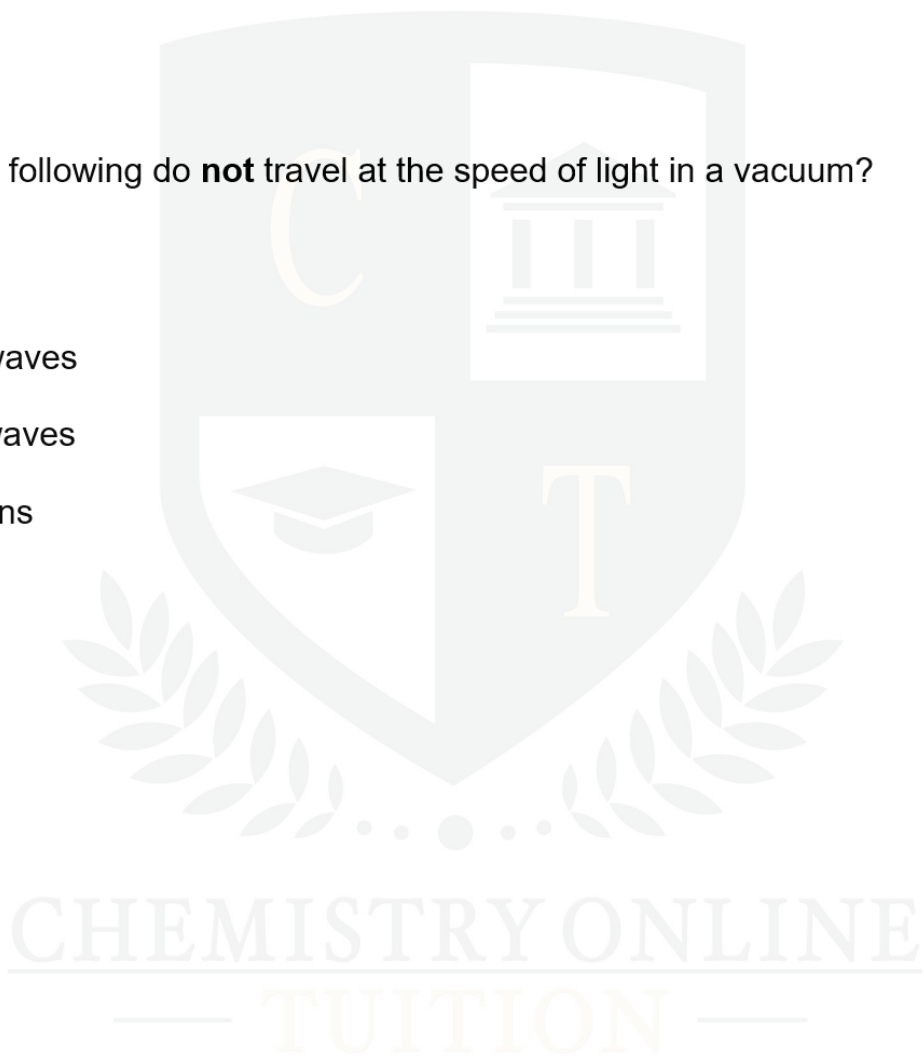
[1 mark]

Question 2

Which of the following do **not** travel at the speed of light in a vacuum?

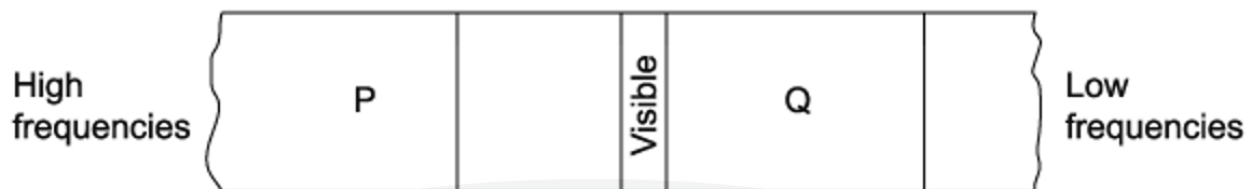
- A x-rays
B radio waves
C microwaves
D electrons

[1 mark]



Question 3

The diagram shows part of the electromagnetic spectrum.



Which row correctly labels the regions marked P and Q?

	P	Q
A	infrared	x-ray
B	ultraviolet	x-ray
C	x-ray	infrared
D	infrared	microwaves

[1 mark]

Question 4

Malus's law shows the intensity of polarised light as it emerges through an analyser. Which is the correct equation to calculate the intensity?

- A** $I_0 \sin^2 \theta$
- B** $I_0 \cos^2 \theta$
- C** $I_0 \cos \theta$
- D** $\frac{I_0}{2} \cos^2 \theta$

[1 mark]

Question 5

Which of the following give the order of magnitude of frequencies of the visible part of the electromagnetic spectrum?

- A** 10^{15} Hz **B** 10^{14} Hz **C** 10^{13} Hz **D** 10^{16} Hz

[1 mark]

Question 6

Which of the following statement is a correct description of part of the electromagnetic spectrum?

- A** waves of wavelength 5×10^{-7} m are infrared waves
B waves of wavelength 5×10^{-9} m are high energy gamma rays
C waves of wavelength 9×10^{-7} m are light waves
D waves of wavelength 3×10^{-8} m are ultraviolet waves

[1 mark]

Question 7

Which of the following waves can be polarised?

- A** transverse
B progressive
C stationary
D longitudinal

[1 mark]

Question 8

Which of the following is the approximate range of frequencies of infrared radiation?

- A $1 \times 10^{14} - 1 \times 10^{16}$ Hz
- B $1 \times 10^{12} - 1 \times 10^{14}$ Hz
- C $1 \times 10^9 - 1 \times 10^{11}$ Hz
- D $1 \times 10^3 - 1 \times 10^9$ Hz

[1 mark]

Question 9

A student looked at the liquid crystal display on their calculator with a polarising film. They observed that as they rotated the film, the display changed.

Which property of the radiation from the calculator display is described correctly?

- A the emitted radiation is a transverse wave
- B the emitted radiation is a wave with 3 cm wavelength
- C the emitted radiation is unpolarised
- D the emitted radiation is a longitudinal wave

[1 mark]

Question 10

The following are statements about waves. Which statement below describes a situation in which polarisation would not happen?

- A microwaves pass through a metal grid
- B sound waves pass through a metal grid
- C light waves are reflected
- D light waves are scattered

[1 mark]

Question 11

Which of the following statements shows that sound waves are longitudinal?

- A sound is diffracted around corners
- B sound is refracted as it passes from hot air to cold air
- C sound cannot be polarised
- D sound can be reflected from a solid surface

[1 mark]

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Question 12

The following statements are about waves.

- 1 Waves can travel through free space
- 2 Waves can be polarised
- 3 Waves have a frequency inversely proportional to their wavelength
- 4 Waves have an intensity proportional to their amplitude

Which ones would apply to both sound and light waves?

- A** 3 only **B** 4 only **C** 1 and 4 **D** 1 and 2

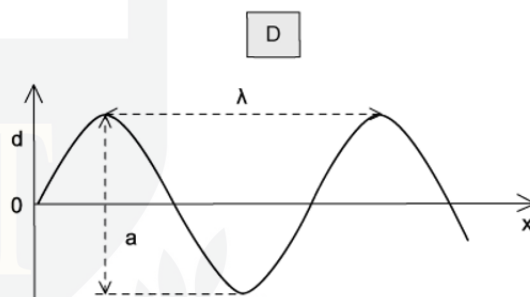
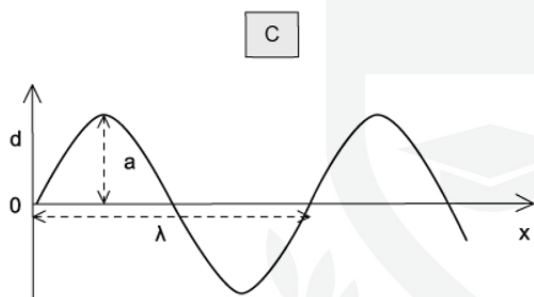
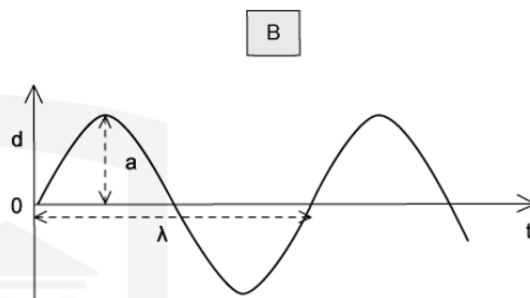
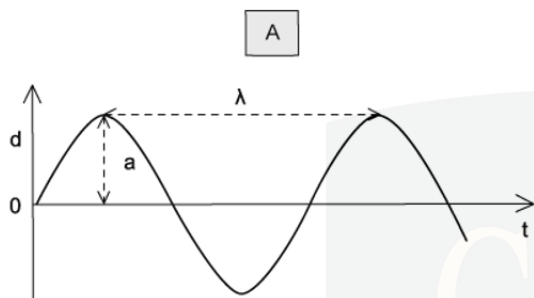
[1 mark]

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Question 13

A sound wave has a displacement y at a distance x from its source at time t .

Which graph shows correctly the amplitude a and the wavelength λ of the wave?



[1 mark]

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