Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : Waves

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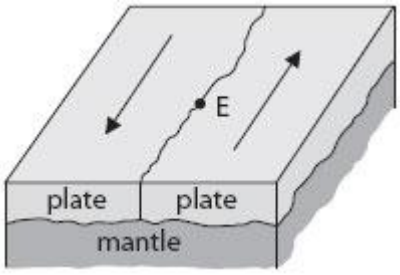
Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

(a) The diagram shows part of the boundary between two tectonic plates.



(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

The plates are being steadily pushed in opposite directions by

(1)

☒ **A** convection currents in the mantle

☒ **B** reflection of waves from the Earth's core

☒ **C** tsunami waves in the ocean

☒ **D** volcanic eruptions on the surface

(ii) An earthquake occurs.
Its epicentre is at the place marked E on the diagram.
Describe what happens at the plate boundary to cause this earthquake.

(2)

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(b) The earthquake causes seismic waves.

(i) S waves are one type of seismic wave. They travel at 0.65 km/s.
There is a seismometer 80 km away from point E.
Show that it takes about 2 minutes for the S waves from the earthquake to reach the seismometer.

(2)

(ii) P waves are another type of seismic wave.
They travel about 10 times more quickly than S waves.

Describe how scientists can use seismometer records of P and S waves to locate the epicentre.

(3)

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(iii) Seismic waves have a frequency of about 15 Hz.
P waves have a much smaller amplitude than S waves.

Some people claim that animals can detect an earthquake before people are aware of it.
Suggest an explanation for this.

(2)

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(Total for Question is 10 marks)

Q2.

Ultraviolet (UV) waves from the Sun travel towards the Earth.

Ultraviolet waves can be grouped by wavelength.

The three groups of wavelengths are UVA, UVB and UVC.

Figure 7 shows, for each group,

- the wavelength range
- the effect of the Earth's atmosphere on each type of UV wave.

	UVA	UVB	UVC
wavelength range	400 nm to 315 nm	314 nm to 280 nm	279 nm to 100 nm
% energy absorbed by the Earth's atmosphere	5%	95%	100%

Figure 7

(i) Explain why UVC is potentially the most dangerous ultraviolet radiation but does not cause harm to people.

(2)

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(ii) The speed of electromagnetic radiation is 3.00×10^8 m/s .

Calculate the frequency of the shortest wavelength of UVB radiation.

(3)

frequency = ... Hz

(Total for question = 5 marks)

Q3.

Ultrasound can be used to find cracks in metals.

Figure 13a shows the signals emitted and received when the metal bar has no cracks.

Figure 13b shows the signals emitted and received when the metal bar has a crack.

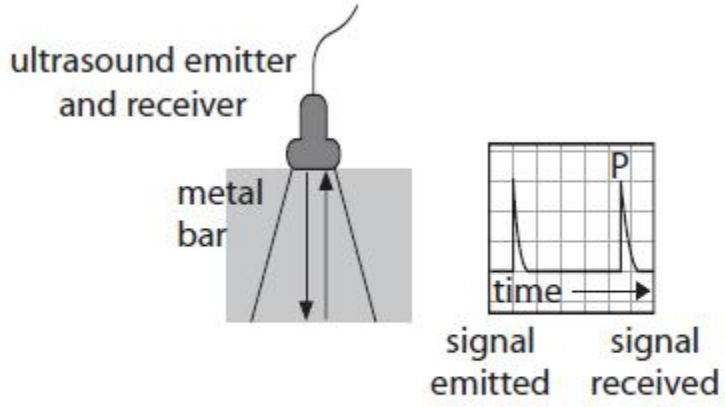

Figure 13a

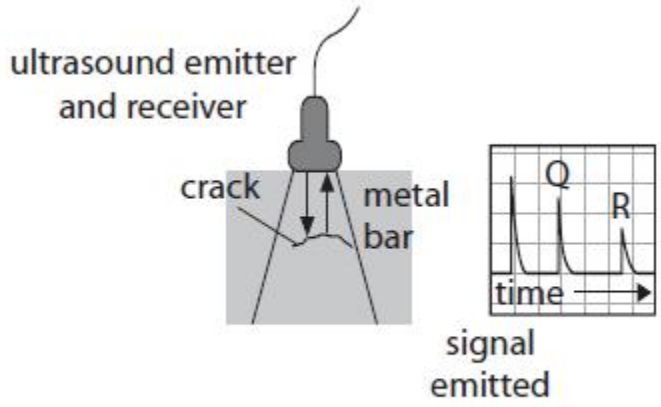

Figure 13b

(i) Explain how the signals in Figure 13a and Figure 13b show that there is a crack in the metal bar in Figure 13b.

(2)

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(ii) Suggest **one** reason why the amplitude of signal R in Figure 13b is smaller than the amplitude of signal P shown in Figure 13a.

(1)

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(Total for question = 3 marks)