Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

Sound travels slower in air than it does in water.

Figure 6 shows the direction of travel of a sound wave approaching a boundary between air and water.

The sound wave refracts at the boundary between air and water.

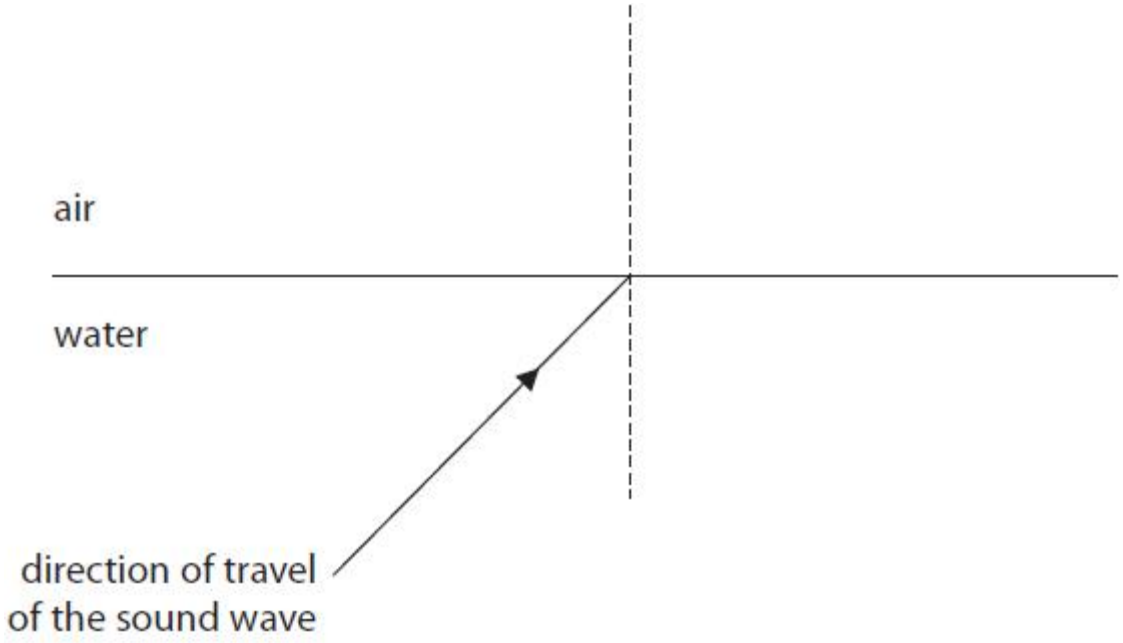

Figure 6

Complete the diagram in Figure 6 to show the direction the sound wave travels in the air.

(Total for question = 2 marks)

Q2.

There are many different types of waves.

Waves on the surface of water are transverse waves.

Sound waves are longitudinal waves.

Describe the difference between transverse waves and longitudinal waves.

(2)

.....

.....

.....

.....

(Total for question = 2 marks)

Q3.

Figure 5 shows a long metal rod and a hammer.
The rod is hit at one end by the hammer.
This causes a sound wave to travel along the inside of the metal rod.

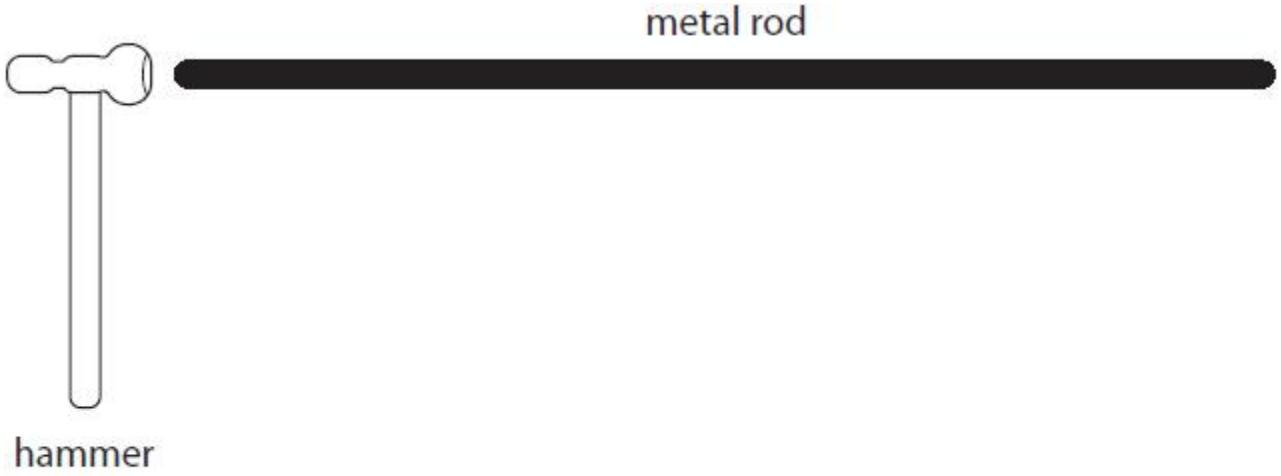

Figure 5

Describe how hitting the rod causes a sound wave to travel along the inside of the rod.

(2)

.....

.....

.....

.....

(Total for question = 2 marks)

Q4.

* Figure 13 shows a beam of red light approaching one side of a rectangular glass block.

The beam of light will pass through the block and leave through the opposite side.

AB is a wavefront.

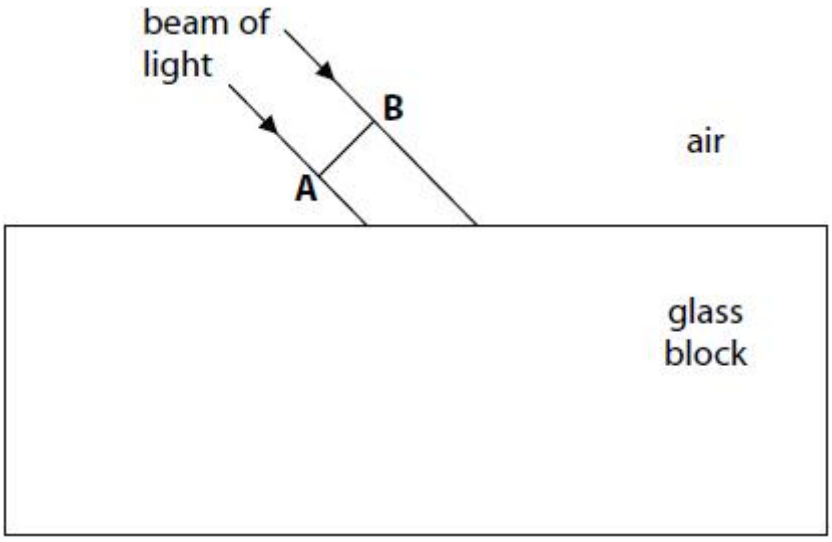

Figure 13

Discuss the path of the wavefront **AB** as it enters and leaves the glass block.

(6)

.....
.....
.....
.....
.....
.....
.....
.....
.....

(Total for question = 6 marks)

Q5.

Figure 6 represents a sound wave coming from a loudspeaker and shows the effects on particles of the air at one instant in time.

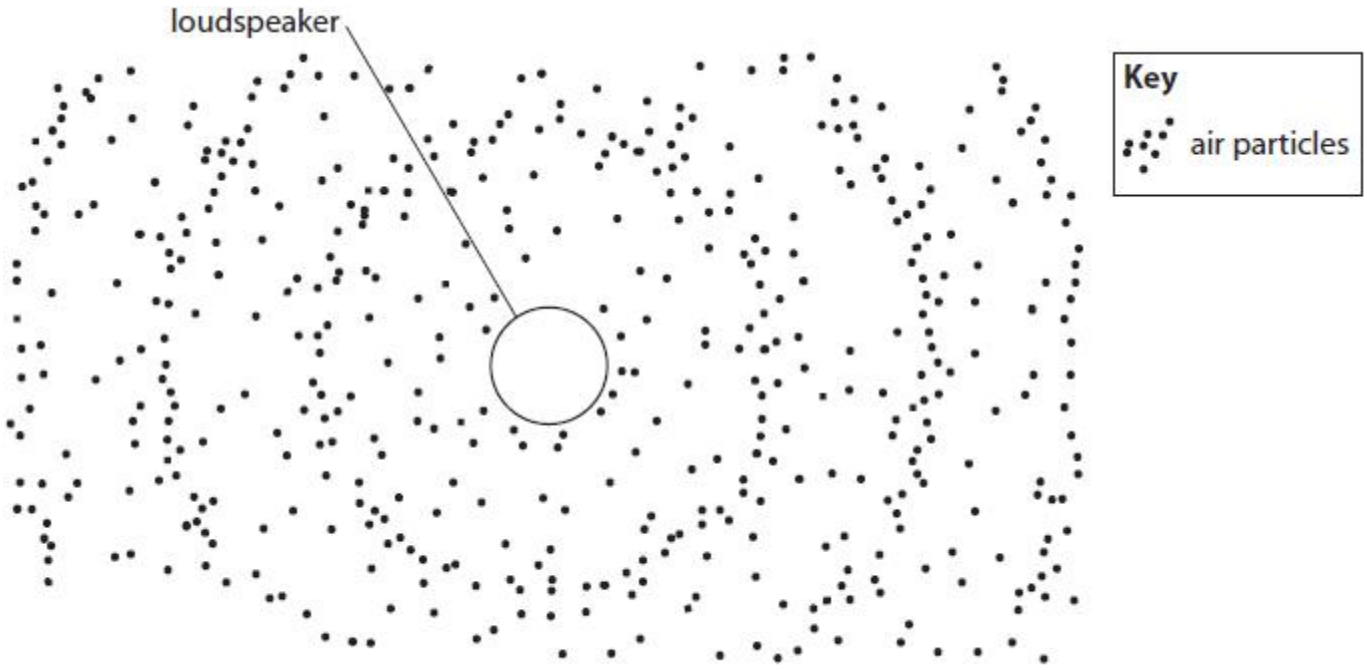

Figure 6

(i) Draw and label a distance of one wavelength in Figure 6.

(1)

(ii) Describe the motion of the particles as the wave travels through the air.

(2)

.....

.....

.....

.....

(Total for question = 3 marks)

Q6.

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 4 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 4

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

(2)

.....

.....

.....

.....

(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)