Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic: Waves (High Demand Questions)

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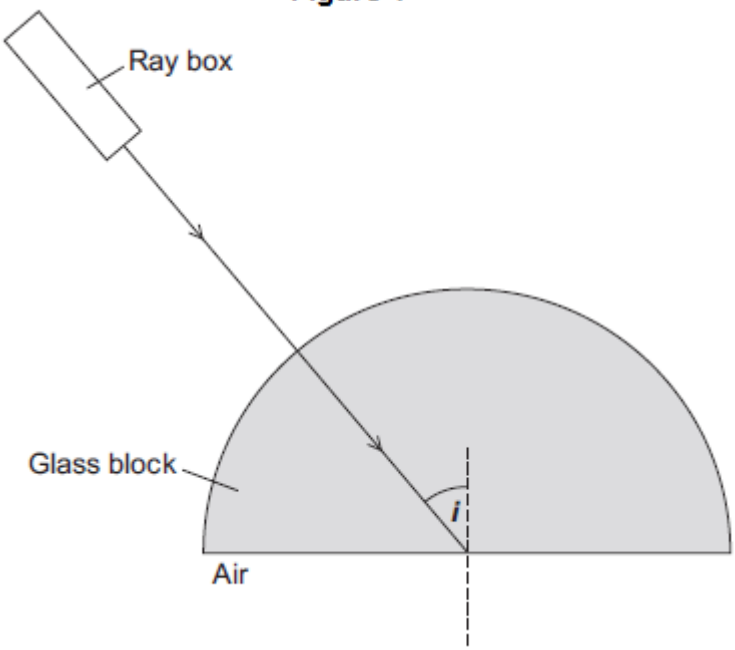
Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

Figure 1 shows a ray of light travelling through a semicircular glass block.
The angle of incidence is labelled ***i***.

Figure 1



(a) (i) The angle of incidence ***i*** equals the critical angle for the glass.

Complete **Figure 1** to show what happens to the ray of light at the glass-to-air boundary.

(1)

(ii) The critical angle for the glass is 41°.

Calculate the refractive index of the glass.

_____

_____

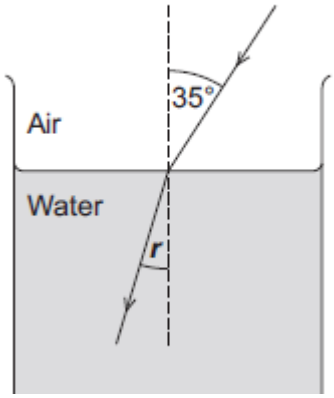
_____

Refractive index = _____

(2)

(b) **Figure 2** shows what happens to a ray of light as it meets the boundary between air and water.

Figure 2



Not to scale

The refractive index of the water is 1.3.

Calculate the angle of refraction ***r***.

_____

_____

_____

_____

_____

Angle of refraction = _____ degrees

(3)

(Total 6 marks)

Q2.

Different parts of the electromagnetic spectrum have different uses.

(a) The diagram shows the electromagnetic spectrum.

Radio waves	Microwaves	Infrared	Visible light	Ultraviolet	X-rays	Gamma rays

(i) Use the correct answers from the box to complete the sentence.

amplitude	**frequency**	**speed**	**wavelength**

The arrow in the diagram is in the direction of increasing _____

and decreasing _____ .

(2)

(ii) Draw a ring around the correct answer to complete the sentence.

The range of wavelengths for waves in the electromagnetic

spectrum is approximately

10^{-15} to 10^{4}
10^{-4} to 10^{4}
10^{4} to 10^{15}

metres.

(1)

(b) The wavelength of a radio wave is 1500 m.
The speed of radio waves is 3.0×10^{8} m / s.

Calculate the frequency of the radio wave.

Give the unit.

_____

_____

_____

Frequency = _____

(3)

(c) (i) State **one** hazard of exposure to infrared radiation.

_____

(1)

(ii) State **one** hazard of exposure to ultraviolet radiation.

_____

(1)

(d) X-rays are used in hospitals for computed tomography (CT) scans.

(i) State **one** other medical use for X-rays.

_____

_____

(1)

(ii) State a property of X-rays that makes them suitable for your answer in part **(d)(i)**.

_____

_____

(1)

(iii) The scientific unit of measurement used to measure the dose received from radiations, such as X-rays or background radiation, is the millisievert (mSv).

The table shows the X-ray dose resulting from CT scans of various parts of the body.

The table also shows the time it would take to get the same dose from background radiation.

Part of the	**X-ray dose**	**Time it would take to get the same**

body	in mSv	dose from background radiation
Abdomen	9.0	3 years
Sinuses	0.5	2 months
Spine	4.0	16 months

A student suggests that the X-ray dose and the time it would take to get the same dose from background radiation are directly proportional.

Use calculations to test this suggestion and state your conclusion.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(3)

(Total 13 marks)