LEVEL -8

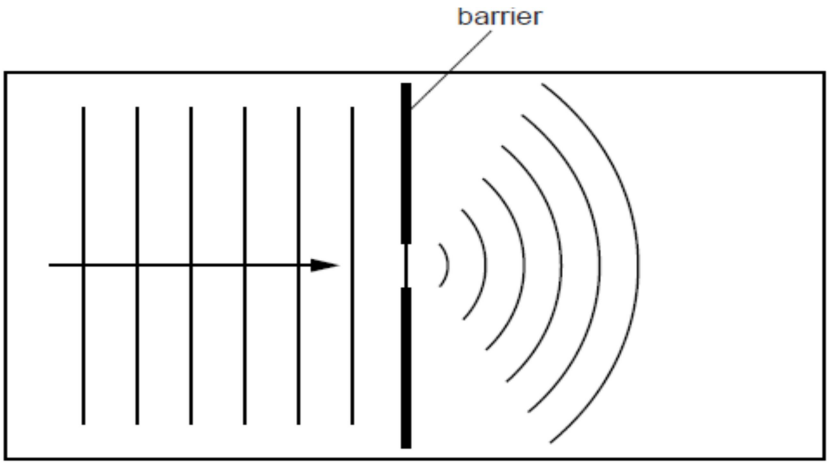
PHYSICS

FINAL TERM REVISION WORKSHEET -4

TOPIC : PROPRTIES OF WAVES & SPECTRA

SECTION B

1. (a) **Figure shows the surface of water in a tank.**



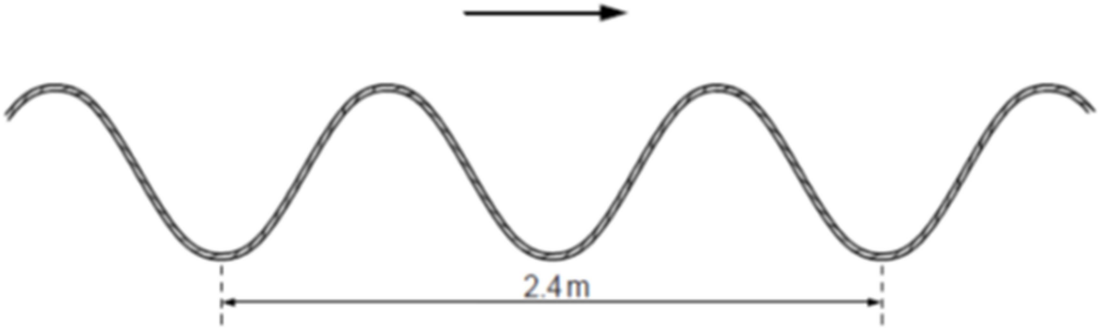
Straight wavefronts are produced at the left-hand end of the tank and travel towards a gap in a barrier. Curved wavefronts travel away from the gap.

(i) Name the process that causes the wavefronts to spread out at the gap.

(ii) Suggest a cause of the reduced spacing of the wavefronts to the right of the barrier.

(iii) State how the pattern of wavefronts to the right of the barrier changes when the gap is made narrower.

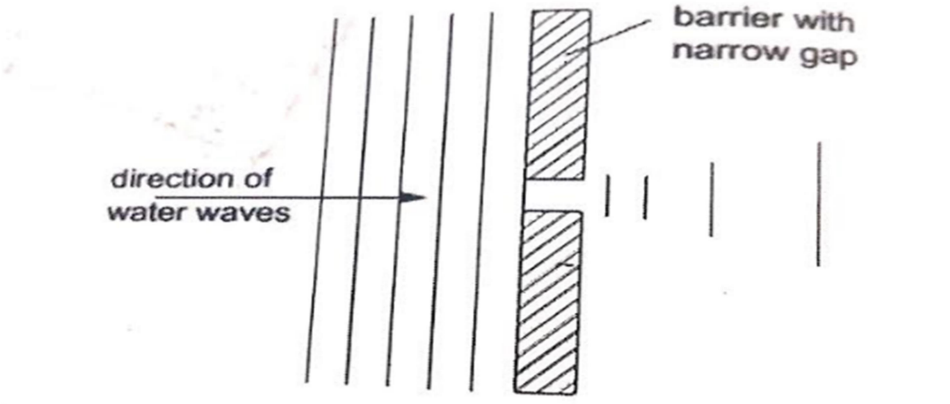
(b)figure shows a wave travelling ,in the direction of the arrow, along the rope.



i. **Explain why the wave shown in figure is described as a transverse wave.**

ii. **The speed of the wave along the rope is 3.2 m/s .Calculate the frequency of the wave.**

2. **Figure is a drawing of a student's attempt to show the diffraction pattern of water waves that have passed through a narrow gap in a barrier.**



(a) State two things that are wrong with the wave pattern shown to the right of the barrier.

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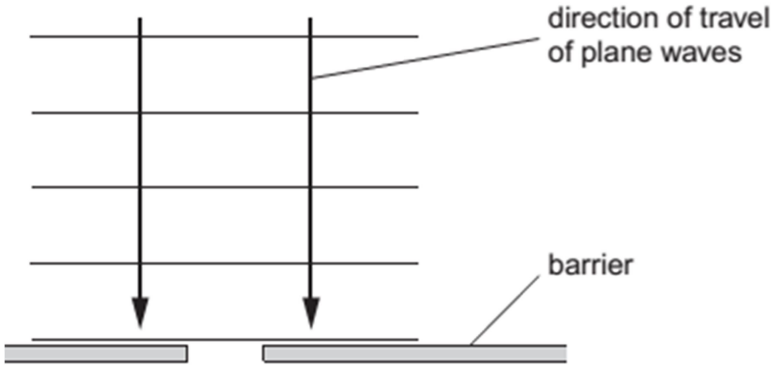
(b) In the space below, sketch the wave pattern when the gap in the barrier is made five times wider.

(c) The waves approaching the barrier have a wavelength of 1.2 cm and a frequency of 8.0 Hz. Calculate the speed of the water waves.

3. **Figure shows a scale drawing of plane waves approaching a gap in a barrier.**



(a) On Fig. , draw the pattern of the waves after they have passed the gap.

(b) The waves approaching the barrier have a wavelength of 2.5 cm and a speed of 20 cm/s. Calculate the frequency of the waves.

(c) State the frequency of the diffracted waves.

4. **(a) The following list contains the names of types of energy transfer by means of waves.**

γ-rays, infra-red, radio/TV/microwaves, sound, visible light, X-rays

(i) Which one of these is **not** a type of electromagnetic wave?

(ii) State the nature of the wave you have named in **(a)(i)**.

(iii) The remaining names in the list are all regions of the electromagnetic spectrum, but one region is missing.

Name the missing region.

(b)

A television station emits waves with a frequency of 2.5×10^8 Hz. Electromagnetic waves travel at a speed of 3.0×10^8 m/s.

Calculate the wavelength of the waves emitted by this television station. State the equation you use.

5.

Here is a list of different types of waves.

gamma (γ)
infra-red
radio
sound
ultra-violet
visible
X-rays

(a) Which one of these is the only one which is **not** part of the electromagnetic spectrum?

(b) Which one of these makes us feel warm when the Sun shines?

(c) Which one of these do doctors use to detect broken bones?

(d) Figure shows part of the electromagnetic spectrum.

(i) On Figure label the positions of γ-rays, visible light waves and radio waves.

(ii) State which of the three types of wave in (i) has the lowest frequency

(iii) State the approximate value of the speed in air of radio waves.