

The following constants may be useful;

Speed of light = $3.0 \times 10^8 \text{ms}^{-1}$

speed of sound in air = 330ms^{-1}

1. (a) Define the following terms in relation to wave motion.

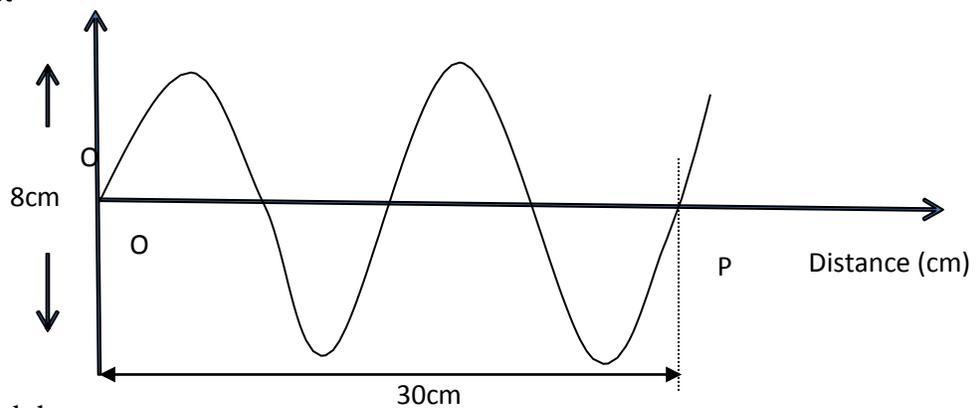
(i) Wave front

(ii) Frequency

(iii) Amplitude

(b) The figure below represents a wave motion in which a crest moves from O to P in 8 seconds.

Displacement
(cm)



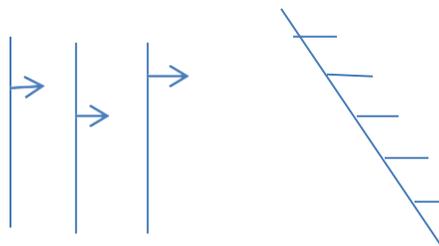
Find the

(i) Amplitude

(ii) Wavelength

(iii) Frequency

(c) Plane waves move towards a reflector as shown in figure below.



Copy and complete the diagram to show the motion of waves after reflection.

2. (a) What is sound?

(b) (i) Distinguish between mechanical and electromagnetic waves.

(ii) State any three examples of mechanical waves and three examples of

electromagnetic waves.

- (c) Describe an experiment that demonstrates that sound is a mechanical wave.
 - (d) A sound wave of frequency 300Hz and wavelength 4m is travelling in water. Calculate the speed and period of the wave.
- 3.
- (a) What is meant by interference of waves?
 - (b) Using a labeled diagram, show how circular water waves are reflected from a concave reflector.
 - (c)
 - (i) State any two properties of electromagnetic waves.
 - (ii) Calculate the frequency of a radio wave of wavelength 2m.
 - (d) Two people X and Y stand in a line at distances 330m and 660m respectively from a high wall. Find the time interval taken for X to hear the first and second sounds when Y makes a loud sound.
- 4.
- (a)
 - (i) What is meant by a stationary wave?
 - (ii) State the conditions necessary for a standing wave to be formed.
 - (b) The distance between two successive antinodes on a standing wave is 3.0cm. If the distance between the source of waves and reflector is 24.0cm, find the
 - (i) number of loops
 - (ii) wavelength of the waves.
 - (c)
 - (i) Sketch the standing wave in a closed tube corresponding to the fundamental note.
 - (iii) If the frequency of the fundamental note in (c)(i) is 110Hz. Find the length of the air column in the tube.

END