2 This question is about waves.

(a) Diagram 1 shows a small boat on the surface of the sea.

The boat moves up and down as water waves pass underneath it.

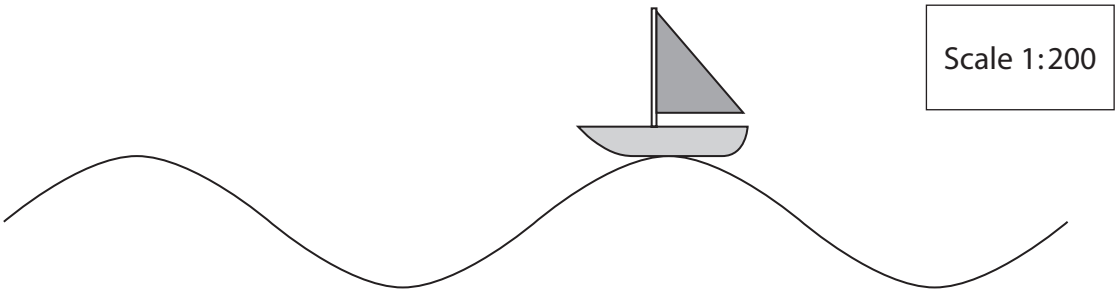

Diagram 1

(i) Using diagram 1, calculate the wavelength of the water waves.
[1 cm on the diagram = 200 cm]

(2)

wavelength = ... cm

(ii) State the equation linking wave speed, frequency and wavelength.

(1)

(iii) The frequency of the water wave is 0.4 Hz.

Calculate the speed of the water wave.

(2)

speed = ... m/s

(iv) Water waves are transverse.

State another example of a transverse wave.

(1)

.....

(b) Diagram 2 shows waves passing through an opening in a harbour wall, with a boat in a calm area of water where there are no waves.

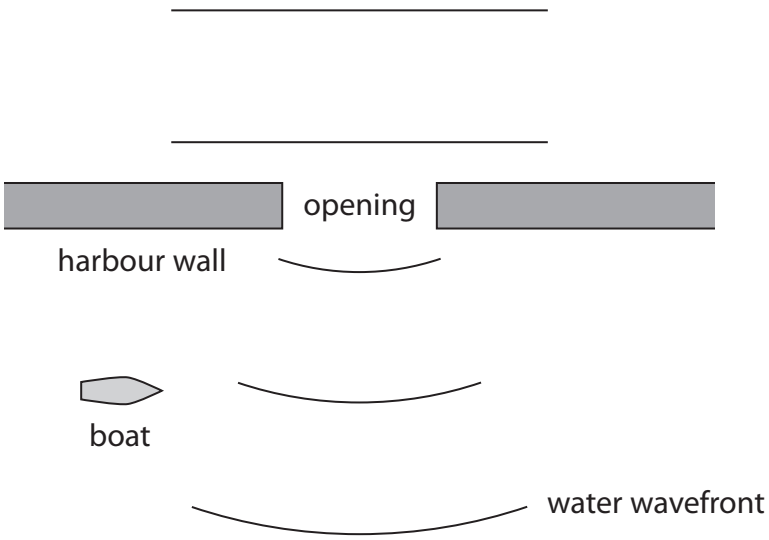

Diagram 2

(i) State the wave phenomenon that causes the waves to spread out as they pass through the opening in the harbour wall.

(1)

(ii) Discuss what would happen to the boat if the size of the opening in the harbour wall changed.

(3)

(Total for Question 2 = 10 marks)