5 **(a)** Explain what is meant by the following quantities for a wave on the surface of water:

(i) displacement and amplitude,

displacement .....

amplitude .....
[2]

(ii) frequency and time period.

frequency .....

time period .....
[2]

(b) Fig. 5.1 represents waves on the surface of water in a ripple tank at one particular instant of time.

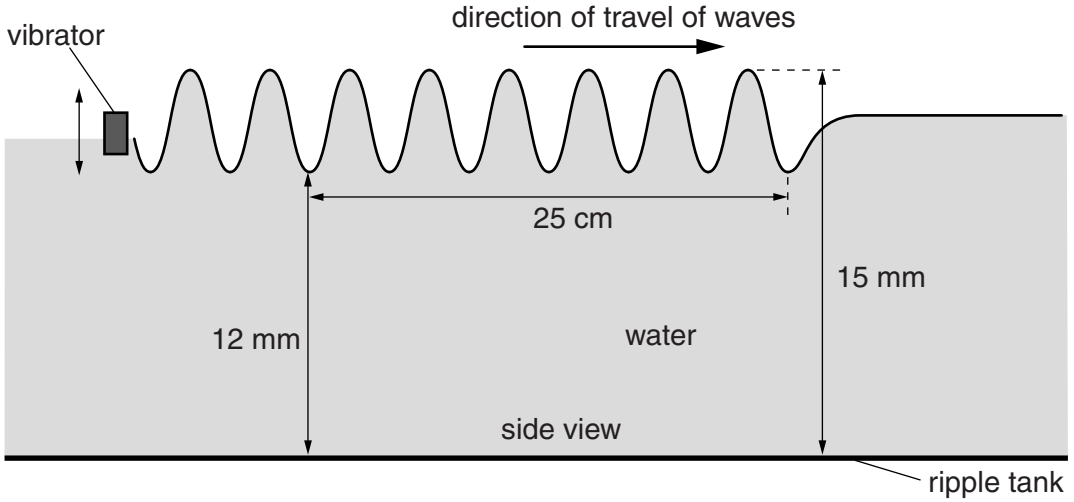

Fig. 5.1 (not to scale)

A vibrator moves the surface of the water to produce the waves of frequency *f*. The speed of the waves is 7.5 cm s^{-1}. Where the waves travel on the water surface, the maximum depth of the water is 15 mm and the minimum depth is 12 mm.

(i) Calculate, for the waves,

1. the amplitude,

amplitude = ... mm [1]

2. the wavelength.

wavelength = ... m [2]

(ii) Calculate the time period of the oscillations of the vibrator.

time period = ... s [2]

(c) State and explain whether the waves on the surface of the water shown in Fig. 5.1 are

(i) progressive or stationary,

.....

..... [1]

(ii) transverse or longitudinal.

.....

..... [1]