3 A small object of mass 24 g rests on a platform. The platform is attached to an oscillator, as shown in Fig. 3.1.

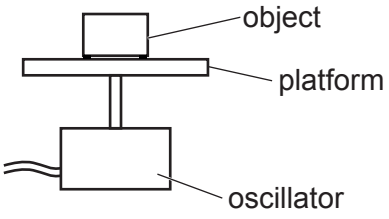

Fig. 3.1

The oscillator moves the platform up and down.

(a) The total energy of the oscillations of the object is 2.2×10^{-4} J.
In one oscillation the object travels a total distance of 14 mm.

Calculate the angular frequency ω of the oscillations.

ω = ... rad s^{-1} [3]

(b) The frequency of the oscillator is fixed, and the amplitude of the oscillations is gradually increased.

(i) Calculate the maximum amplitude of the oscillations so the object does not lose contact with the platform.

amplitude = ... m [2]

(ii) The amplitude of the oscillations is increased so it is greater than the value in **(b)(i)**.

State and explain the position in an oscillation where the object first loses contact with the platform.

.....

.....

.....

..... [2]

[Total: 7]