

11 The International Space Station (ISS) is in a low Earth orbit. Astronauts in ISS have an apparent weight of zero. In order to determine their mass, the astronauts must secure themselves to a platform which is set into oscillation and moves with simple harmonic motion.

(a) Explain why the astronauts in the ISS have an apparent weight of zero.

(2)

(b) State what is meant by simple harmonic motion.

(2)

(c) Describe how, using a stopwatch and a ruler, the following quantities could be determined for the oscillating platform:

(i) the frequency of oscillation

(2)

(ii) the maximum speed of the platform.

(2)

(d) The platform continues to move with simple harmonic motion at the same frequency, but its amplitude is doubled.

Explain how the maximum kinetic energy of the platform will change.

(2)