Q1.

The symbol '*g*' can be used to refer to the acceleration due to gravity.

The acceleration due to gravity '*g*' has the unit of m/s^2.

'*g*' can also have another unit.

Which of these is also a unit for *g*?

(1)

☒ **A** J/kg
☒ **B** J/kg^2
☒ **C** N/kg
☒ **D** N/kg^2

(Total for question = 1 mark)

Q2.

A student has some cupcake cases.

One cupcake case is shown in Figure 2.

(Source: © Anton Starikov/Shutterstock)

Figure 2

(ii) A stack of cupcake cases has a mass of 0.005 kg.

Calculate the weight, in newtons, of the stack of cupcake cases.
Gravitational field strength = 10 N / kg

(2)

Use the equation

$$W = mg$$

weight = ... N

(Total for question = 8 marks)

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Q3.

A rock on the surface of the Earth has a mass of 12 kg.

(i)   Calculate the weight of this rock on the surface of the Earth.
The gravitational field strength on the surface of the Earth is 10 N/kg.
Use the equation

$$W = m \times g$$

(2)

weight on the Earth = ... N

(ii)   The weight of the same rock on the surface of the Moon is 20 N.
Calculate the gravitational field strength on the surface of the Moon.

(3)

gravitational field strength on the Moon .... N/kg

(Total for question = 5 marks)

Q4.

The gravitational field strength on the Moon is 1.6 N/kg.
The mass of a rock on the Moon is 6.0 kg.

Calculate the weight of this rock on the Moon.
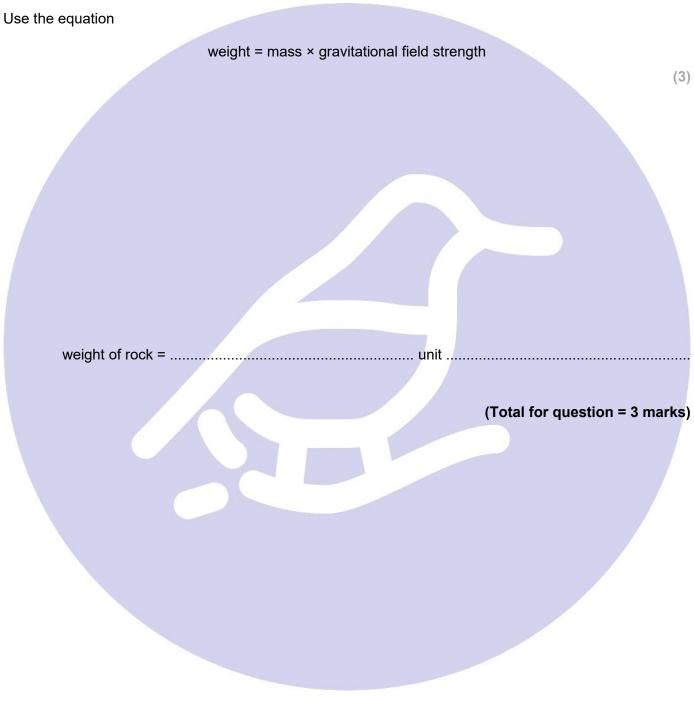
State the unit of weight.

Use the equation

weight = mass × gravitational field strength

(3)

weight of rock = ... unit ....

(Total for question = 3 marks)

Q5.

Figure 3 shows a Mars Exploration Rover.

(Source: *photojournal.jpl.nasa.gov*)

Figure 3

The mass of the rover is 190 kg.

(i)   The gravitational field strength on Earth is 10 N / kg.

Calculate the weight of the rover on Earth.
Use the equation

weight = mass × gravitational field strength

(1)

weight on Earth = ... N

(ii)   The weight of the rover on Mars is 700 N.

Calculate the gravitational field strength on Mars.

(2)

gravitational field strength on Mars = ... N/kg

(Total for question = 3 marks)

Q6.

The diagram shows the forces acting on a car which is travelling along a flat straight road.

The mass of the car is 625 kg.

Calculate the weight of the car.

gravitational field strength = 10N/kg

(2)

(Total for question = 3 marks)