Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Energy (Low Demand)

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

In an experiment, a beam of alpha particles was directed at a thin sheet of gold foil.

(a) Most of the alpha particles passed straight through the gold foil.

Alpha particles which passed close to the nucleus of a gold atom did **not** pass straight through.

What happened to the alpha particles which passed close to the nucleus of a gold atom?

_____

_____

(1)

(b) The results suggested that the diameter of the nucleus of a gold atom is $\frac{1}{6000}$ of the diameter of the atom.

The diameter of a gold atom is 0.18 nm

Calculate the diameter of a gold nucleus in nm

_____

_____

_____

_____

Diameter = _____ nm

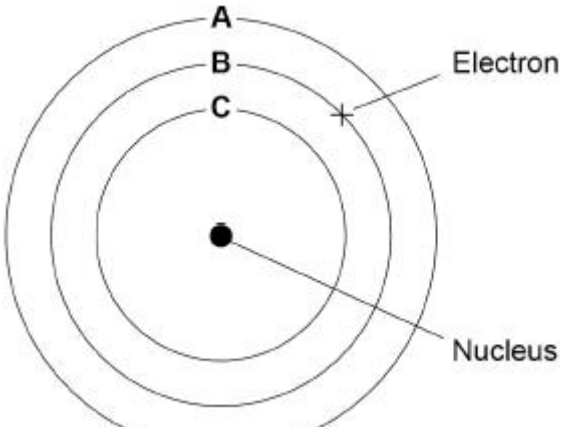
(2)

(c) Further experiments showed that gold nuclei are surrounded by electrons in different energy levels.

Figure 1 shows three of the energy levels around the nucleus of a gold atom.

Figure 1

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The electron in energy level **B** absorbs electromagnetic radiation.

Which energy level will the electron be in after it has absorbed the electromagnetic radiation?

Tick (✓) **one** box.

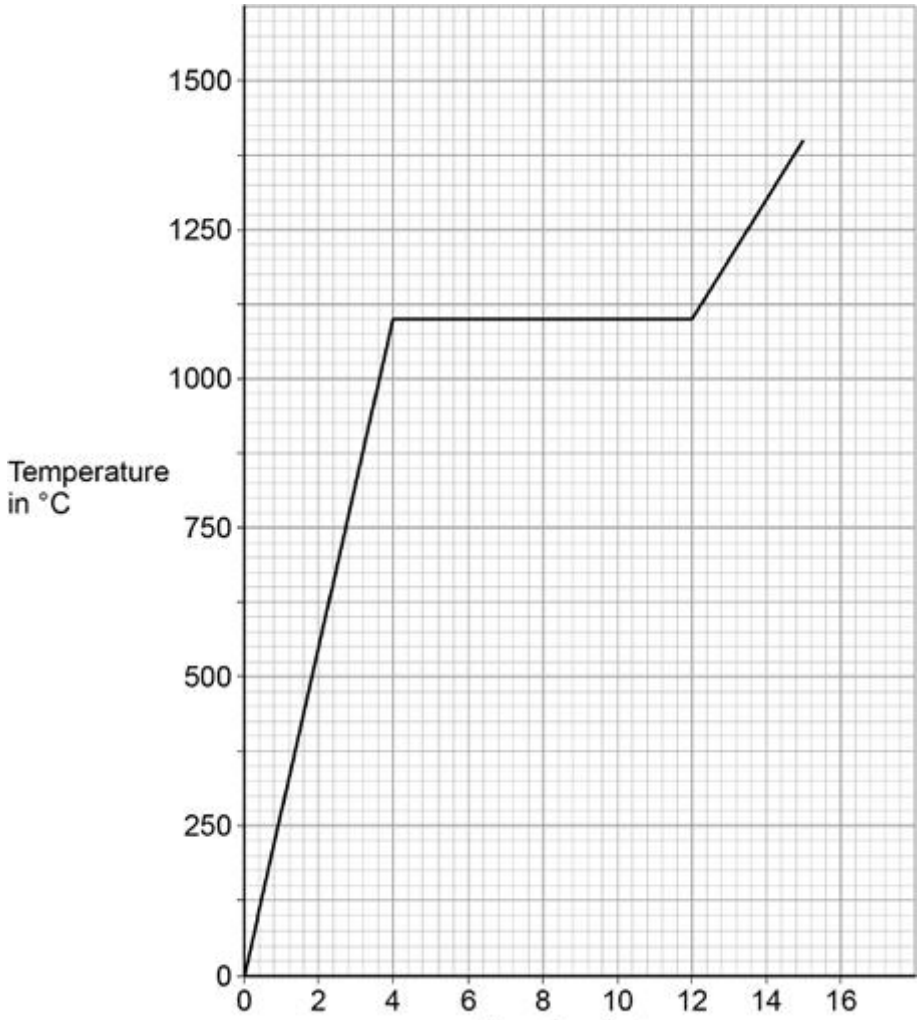
A ☐ **B** ☐ **C** ☐

(1)

Figure 2 shows how the temperature of a small sample of gold changes as it is heated from a solid to a liquid.

Figure 2

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(d) What is the melting point of the gold?

Melting point = _____ °C

(1)

(e) How many minutes did it take for all of the gold in the sample to change from solid to liquid?

Time taken = _____ minutes

(1)

(f) What does the gradient of the graph in **Figure 2** represent?

Tick (✓) **one** box.

The internal energy of the gold ☐

The rate of change of temperature of the gold ☐

The specific heat capacity of the gold ☐

(1)

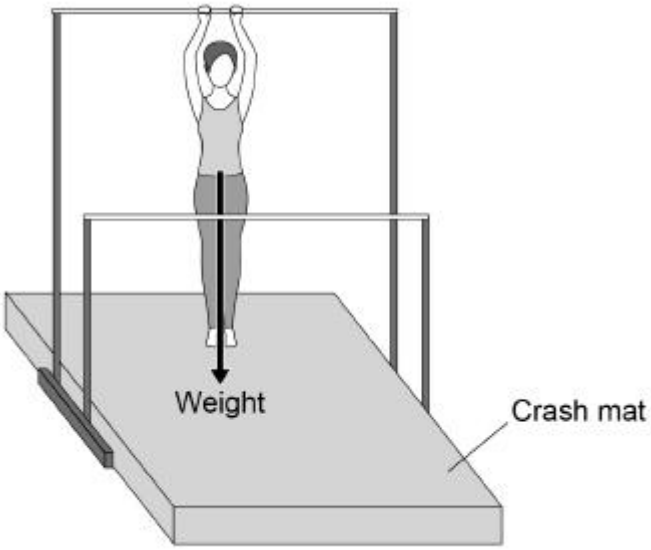
(Total 7 marks)

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Q2.

The diagram shows a gymnast on a piece of gymnastic equipment.

The equipment consists of two bars at different heights.



(a) The gymnast exerts a downward force on the bar.

What is the size of the upward force acting on the gymnast from the bar?

Tick (✓) **one** box.

It is greater than the downward force.	☐
It is less than the downward force.	☐
It is the same size as the downward force.	☐

(1)

(b) Why is the weight of the gymnast represented by an arrow?

Tick (✓) **one** box.

Weight is a constant.	☐
Weight is a scalar.	☐
Weight is a unit.	☐
Weight is a vector.	☐

(1)

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(c) The diagram above shows the weight of the gymnast acting from a point.

What name is given to this point?

Tick (✓) **one** box.

Centre of force ☐

Centre of mass ☐

Centre of tension ☐

Centre of weight ☐

(1)

(d) The gymnast has a mass of 45 kg

gravitational field strength = 9.8 N/kg

Calculate the weight of the gymnast.

Use the equation:

weight = mass × gravitational field strength

_____

_____

_____

_____

Weight = _____ N

(2)

(e) The gymnast swings from one bar to the other bar several times.

Describe how the gravitational potential energy store and the kinetic energy store of the gymnast change as she moves between the bars.

_____

_____

_____

_____

_____

_____

_____

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_____

(4)

(f) Falling on the crash mat reduces the average deceleration of the gymnast compared with falling on a hard surface.

Explain why reducing the deceleration is important to the gymnast.

_____

_____

_____

_____

_____

_____

(2)

(Total 11 marks)

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