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

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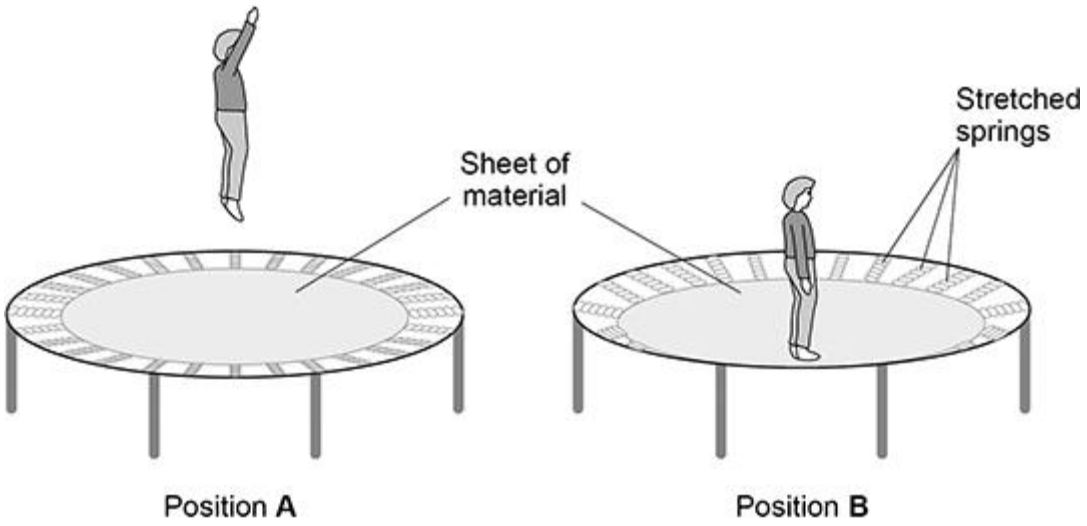
Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Q1.

A trampoline is made from a sheet of material held in place by stretched springs.

The figure below shows a child on a trampoline.



(a) Position **A** shows the child's maximum height above the trampoline.

Position **B** shows the lowest position reached by the child when landing on the trampoline.

Describe the changes to the stores of energy of the:

- child
- springs
- surroundings

as the child moves from position **A** to position **B**.

Child _____

_____

_____

_____

_____

Springs _____

_____

_____

Surroundings _____

_____

_____

(4)

(b) When the child is at position **A**, each trampoline spring is stretched by 0.056 m

The elastic potential energy of each spring is 4.9 J

When the child is at position **B**, the elastic potential energy of each spring increases to 8.1 J

Calculate the extension of each spring when the child is at position **B**.

Use the Physics Equations Sheet.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Extension = _____ m

(5)

(c) As the child bounces on the trampoline the child does work.

What is the work done by the child equal to?

Tick (✓) **one** box.

The average force applied by the child ☐

The maximum force applied by the child ☐

The total energy store of the child ☐

The total energy transferred by the child ☐

(1)

(Total 10 marks)

Q2.

The photograph below shows a sailing boat crossing an ocean.

There is a wind turbine on the boat.

(a) The wind turbine generates electricity to charge a battery on the boat.

Name one **other** renewable energy resource that could be used on the boat to generate electricity.

_____

(1)

(b) The boat also has a generator that burns a fossil fuel.

The battery can be charged by either the wind turbine **or** the generator.

Give **two** reasons why this is useful.

1 _____

_____

2 _____

_____

(2)

(c) Explain **one** environmental impact of using fossil fuels to generate electricity.

_____

_____

_____

_____

(2)

(d) The kinetic energy of the boat is 81 kJ.

mass of boat = 8000 kg

Calculate the speed of the boat.

_____

_____

_____

_____

_____

_____

_____

Speed = _____ m/s

(4)

(e) As the boat passes over a wave, the gravitational potential energy of the boat increases by 19 600 J.

mass of boat = 8000 kg

gravitational field strength = 9.8 N/kg

Calculate the change in height of the centre of mass of the boat as it passes over the wave.

_____

_____

_____

_____

_____

_____

Change in height = _____ m

(3)

(Total 12 marks)