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

Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

Some street lamps contain sodium.

Below are two isotopes of sodium.

$^{23}_{11}Na$ $^{24}_{11}Na$

(a) What are isotopes?

_____

_____

_____

_____

(2)

(b) How many protons and neutrons are in a nucleus of $^{23}_{11}Na$?

Number of protons = _____

Number of neutrons = _____

(2)

(c) The sodium atoms emit light.

What would cause light to be emitted from a sodium atom?

Tick **one** box.

Electrons being emitted from the nucleus.	☐
Electrons falling to a lower energy level.	☐
Electrons leaving the atom when it is ionised.	☐
Electrons moving to a higher energy level.	☐

(1)

(d) In a street lamp, solid sodium is melted and vaporised.

Describe how the arrangement of the sodium atoms changes as the sodium goes from solid to liquid to gas.

_____

_____

_____

_____

_____

_____

_____

_____

(4)

The table shows the power ratings of some types of sodium lamp.

Type of sodium lamp	Power in Watts
A	35
B	50
C	70
D	100
E	150

(e) Some main roads are lit by type **E** sodium lamps.

Calculate the energy transferred by one type **E** sodium lamp in 1 hour.

_____

_____

_____

_____

_____

Energy transferred = _____ J

(3)

(f) Many housing estates are lit by type **A** sodium lamps.

Suggest **two** advantages of using type **A** sodium lamps on housing estates.

1. _____

2. _____

(2)

(Total 14 marks)

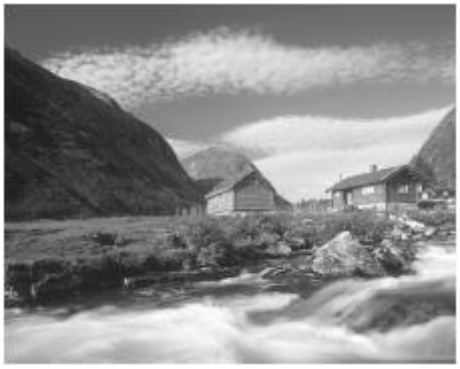
Q2.

A small community of people live in an area in the mountains.
The houses are not connected to the National Grid.

The people plan to buy an electricity generating system that uses either the wind or the flowing water in a nearby river.

Figure 1 shows where these people live.

Figure 1



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(a) It would not be economical to connect the houses to the National Grid.
Give **one** reason why.

_____

_____

_____

_____

(1)

(b) **In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.**

Information about the two electricity generation systems is given in **Figure 2**.

Figure 2

The wind turbine costs £50 000 to buy and install.
The hydroelectric generator costs £20 000 to buy and install.
The average power output from the wind turbine is 10 kW.
The hydroelectric generator will produce a constant power output of 8 kW.

Compare the advantages and disadvantages of the two methods of generating electricity.

Use your knowledge of energy sources as well as information from **Figure 2**.

(6)

(Total 7 marks)