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

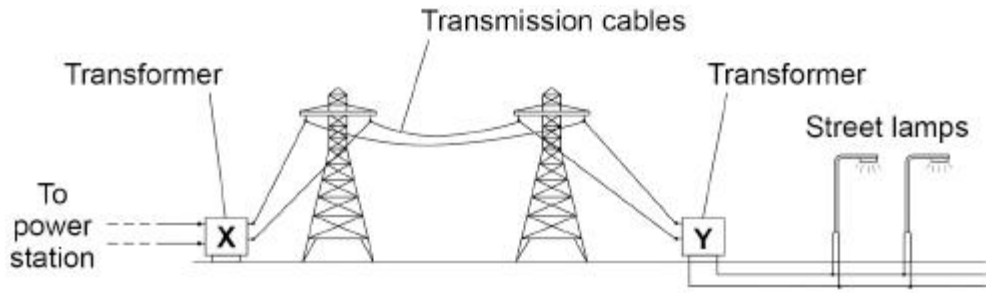
Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Q1.

Figure 1 shows how the National Grid transfers energy from a power station to some street lamps.

Figure 1



(a) Explain how transformer **X** increases the efficiency of the National Grid.

_____

_____

_____

_____

_____

_____

(3)

(b) The potential difference across the primary coil in transformer **Y** is 400 000 V.

The potential difference across the secondary coil is 11 000 V.

The current in the primary coil is 660 A.

Calculate the current in the secondary coil of transformer **Y**.

Use the Physics Equations Sheet.

_____

_____

_____

_____

Current in the secondary coil = _____ A

(3)

(c) Why is the current in each street lamp less than the current in the secondary coil in transformer **Y**?

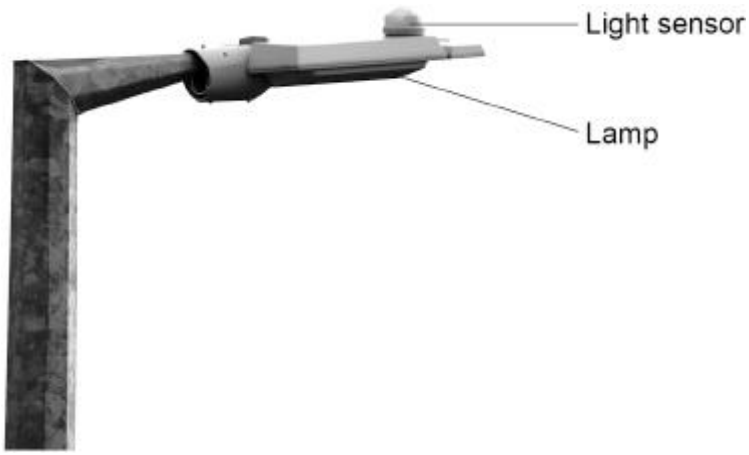
Tick (✓) **one** box.

Current is used up in the cables between **Y** and each street lamp.	☐
Some of the current is dissipated to the surroundings.	☐
The cables between **Y** and the street lamps have electrical resistance.	☐
The street lamps are connected in parallel.	☐

(1)

(d) **Figure 2** shows the top of a street lamp.

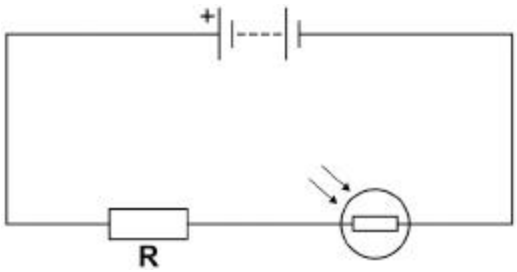
Figure 2



The light sensor detects if it is day or night.

Figure 3 shows part of the circuit in the light sensor.

Figure 3



Explain what happens to the potential difference across resistor **R** as the light intensity decreases.

(3)

(e) When the current in resistor **R** is 20 mA, the power transferred by resistor **R** is 6.0 W.

Calculate the resistance of resistor **R**.

Use the Physics Equations Sheet.

Resistance = _____ Ω

(4)

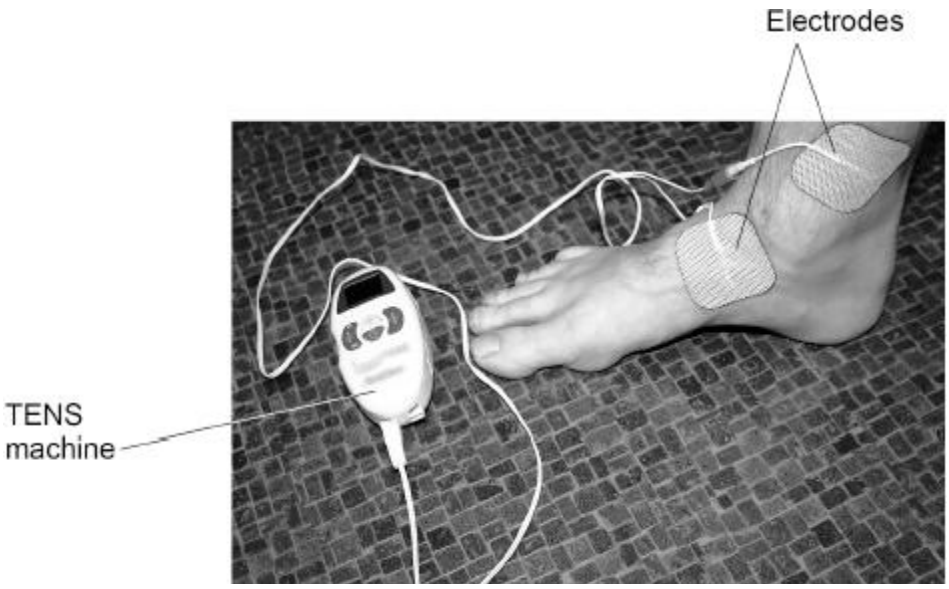
(Total 14 marks)

Q2.

A TENS machine uses an electrical current to relieve pain.

Figure 1 shows the electrodes of a TENS machine connected across an ankle.

Figure 1



(a) The maximum power of the TENS machine is 240 mW.

The potential difference across the battery in the TENS machine is 2.5 V.

Calculate the maximum current from the battery.

_____

_____

_____

_____

_____

_____

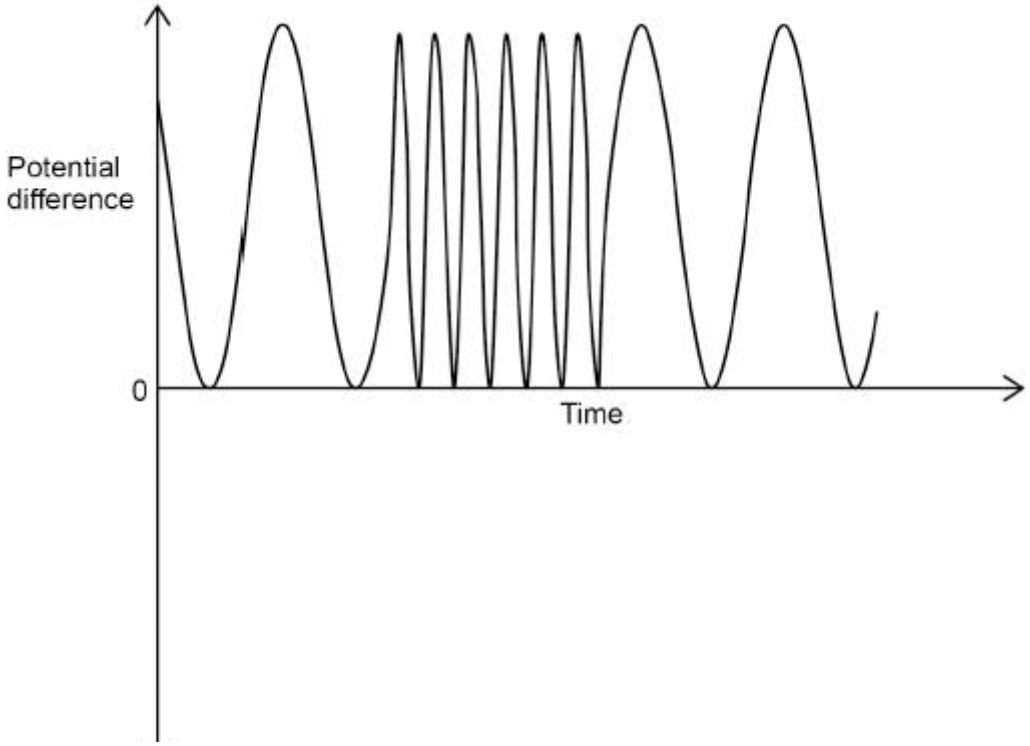
_____

Maximum current = _____ A

(4)

(b) **Figure 2** is a sketch graph showing how the potential difference across the electrodes varies with time.

Figure 2



A student concluded that there was an alternating potential difference across the electrodes.

How does **Figure 2** show that the student was **not** correct?

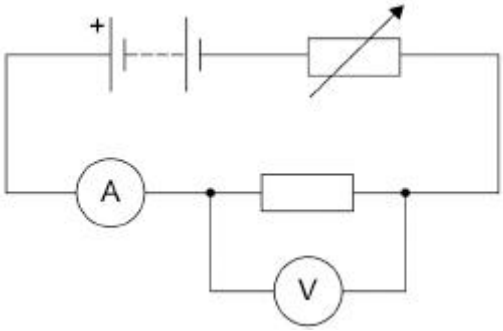
_____

_____

(1)

Figure 3 shows a circuit the student built using the battery from the TENS machine.

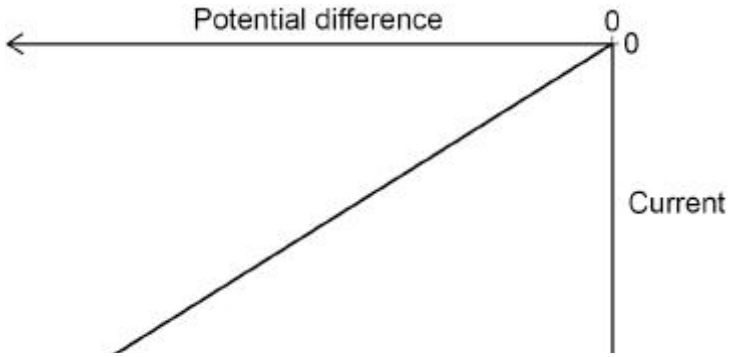
Figure 3



The student recorded how the current in the resistor varied with the potential difference across the resistor.

Figure 4 shows a sketch graph of the results.

Figure 4



(c) What relationship does **Figure 4** show?

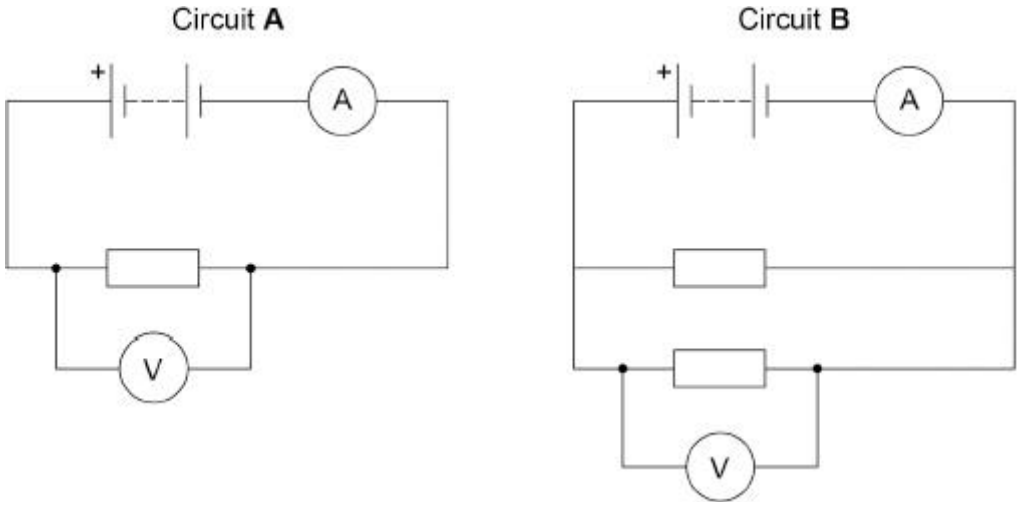
_____

_____

(1)

(d) **Figure 5** shows two more circuits that the student built using the battery from the TENS machine.

Figure 5



The resistors all have the same resistance.

Compare the readings on the voltmeter and ammeter in circuit **A** and circuit **B**.

Voltmeter _____

_____

_____

Ammeter _____

_____

_____

(3)
(Total 9 marks)