KALPAVRUKSHA MODEL SCHOOL

**ASSIGNMENT**

**Class: X Sub: PHYSICS Date:21.5.2021**

**Topic: ELECTRICITY**

**I. Answer the following questions:**

1.What is meant by “electrical resistance” of a conductor.

Ans: The property of a conductor due to which it opposes the flow of current through it is called resistance.

2.What is meant by electrical resistivity of a material? Derive an expression and write its SI units.

Ans: The resistivity is a resistance when length of a wire is 1 meter and

area of cross section of wire is 1 square unites.

It has been found by experiments that :

The resistivity of a given of a given conductor is directly proportional to its length.

R ∝ l ……………..(1)

The resistivity of a given conductor is inversely proportional to its area of cross section.

R ∝ 1/A …………… (2)

Combining (1) and (2), we get :

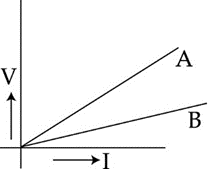
R ∝ l/A

R =𝑝×𝑙/𝐴 ………………….(3)

Where p(rho) is a constant known as resistivity of the material.

The S.I. unit of resistivity is ohm-meter (Ωm)

3. V-I graph for the two wires A and B are shown in the figure. If we connect both the wires one by one to the same battery which of the two will produce wore heat per unit time? Give justification for your answer.



Ans: ‘A’ will produce more heat per unit time. It is because potential difference and current is maximum at A

4.A wire is 1m long, 0.2mm in diameter and has resistance of 10 Ω. Calculate its resistivity.

Ans: length,l=1m, Radius,r=d/2=0.2/2=0.1mm=0.1x10-3m. R=10 Ω

ρ = R A/L = [R x ∏ r 2] / L=10x3.14x(0.1x10-3)2/1=0.314x10-6 Ωm.

5.You have been assigned a duty to create awareness in your school about saving electricity.

(i) Write any two ways by which you will create among your school mates about saving electricity.

(ii) Explain how saving electricity is important at an individual level and at national level.

* Ans (i) [1. Take advantage of natural sunlight](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_1)
* [2. Switch Over to LEDs or CFLs](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_2)
* [3. Invest in energy-saving power strips](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_3)
* [4. Change Televisions to Flat and LCD Screens](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_4)
* [5. Invest in Better Cooling Options](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_5)
* [6. Encourage Students to Recycle](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_6)
* [7. Use Sensors for Turning Lights On or Off In a Room](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_7)
* [8. Consider Upgrading the Kitchen](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_8)
* [9. Have Class in the Grass](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_9)
* [10. Keep Doors to Different Areas Closed](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_10)
* [11. Consider Changing Your Electricity Provider](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_11)
* [12. Assign Classroom Jobs](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_12)
* [13. Turn Off Lights and All Screens](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_13)
* [14. Close Unused Rooms and Spaces](https://paylesspower.com/blog/how-to-save-energy-at-school/#how-to-save-energy-at-school_14)

(ii) Traditional incandescent light bulbs consume an excessive amount of electricity and must be replaced more often than their energy efficient alternatives. Halogen incandescent bulbs, compact fluorescent lights (CFLs), and light-emitting diode bulbs (LEDs) use anywhere from 25-80 percent less electricity and last 3 to 25 times longer than traditional bulbs.

Although energy efficient bulbs are more expensive off the shelf, their efficient energy use and longer lifetimes mean that they cost less in the long run.

**II. Read the lesson “Electricity” from text book.**