G9 Science: Class 12 Homework

1. Calculate the efficiency of a compact fluorescent light bulb if it produces 30J of light energy, while using 95J of electrical energy. Use GRASS method. **[5 marks]**

2. Calculate the cost of operating the following devices if the cost of electricity is $0.12/kW•h.

    a. 100W incandescent light bulb for 1000 hours **[3 marks]**

    b. 13W fluorescent light bulb for 1000 hours **[3 marks]**

    c. 400W computer for 600 hours **[3 marks]**

    d. 750W refrigerator for 1 year **[3 marks]**

3. Calculate the difference between the operating cost of a 60W incandescent light bulb and a 13W fluorescent light bulb each operating for 100 hours. The cost of electricity is $0.11/kW•h. Use the GRASS method. **[7 marks]**

4. Draw a circuit diagram of:

    a. A circuit that contains a two-cell battery, two lamps, and a switch all connected in series **[5 marks]**

    b. A circuit that contains a two-cell battery, three lamps in parallel, and a switch that controls the whole circuit **[6 marks]**

    c. A series circuit that contains a three-cell battery, three lamps and an ammeter attached to the first lamp, a voltmeter connected to the second lamp and an ohmmeter attached to the third lamp. **[8 marks]**

5. Why are the outlets in homes never wired in series? What problems might this present? **[2 marks]**

6. What effect would the following changes have on a conductor's resistance? In each situation, explain why the change occurs.

    a. Decreasing the diameter of a conductor **[2 marks]**

    b. Placing an extension cord outside in the summer **[2 marks]**

    c. Plugging two identical extension cords together to make it longer **[2 marks]**

    d. Changing from a copper conductor to a silver conductor **[2 marks]**

7. Typical household circuits can carry a maximum current of 15A. If a wire has a resistance of 8.0Ω, determine the voltage across the energy source. Use GRASS method. **[5 marks]**

8. A laptop computer adaptor has a voltage of 19V. It has a resistance of 4.0Ω, determine the current going through the adapter. Use GRASS method. **[5 marks]**

9. Which of the following graphs shows a load with a greater resistance? Explain your answer. **[3 marks]**

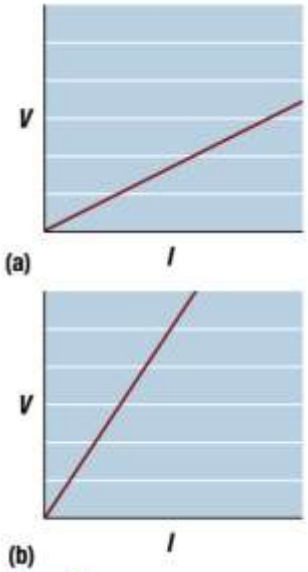

Figure 2

10. A student is investigating a resistor. She has collected the data shown in Table 1. Plot the data on a graph, then calculate the resistance. **[8 marks]**

Table 1 Potential Difference and Current Data

Potential difference (V)	Current (A)
2.5	0.002
6.0	0.005
8.7	0.007
11.6	0.009
14.5	0.012