Electricity Review Quiz **Name** Key

Useful equations:

V = IR **P=VI** **P=ΔE/t** **I=Q/t**

Unless otherwise indicated, questions (or parts of questions) are worth one mark each

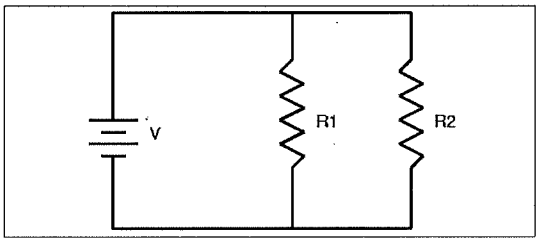
1. What is static electric charge?
   electric charges at rest
2. What is the difference between charging by conduction and charging by induction?
   conduction requires objects to touch, induction does not
3. Why is it easier to determine for sure that two things have the same charge than opposite charges?
   like charges repel, but a charged object will also attract a neutral object
4. What happens to the strength of the electric force between two objects when the distance is increased?
   it decreases
5. What is the difference between series and parallel circuits?
   electricity
6. What is the difference between electron flow and conventional current?
   electron flow is negative to positive, conventional current is positive to negative
7. What is the difference between kinetic and potential energy?
   Kinetic = energy in motion, potential = stored energy
8. A student touches a Van de Graaff generator while standing on an insulating platform. After a while, **her hair stands on end**. When the generator is turned off, the student remains standing on the platform without touching anyone or anything else. After a while, **her hair begins to settle down**. Explain these two observations. (2)
   - hair has the same charge, hairs repel each other. After turning the machine off, charges begin to dissipate through moisture in the air
9. An electric kettle has 12A of current passing though it when it is plugged into a 120V source. What is the resistance of the kettle? (2)

$$R = \frac{V}{I} = \frac{120V}{12A} = 10\,\Omega$$

10. How much current does a 25W light bulb draw from a household electrical outlet? The voltage of the outlet is 120V. (2)

$I = \frac{P}{V} = \frac{25W}{120V} = 0.21A$

11. The circuit diagram below shows two resistors connected in parallel. The values of R1 and R2 are 100Ω and 200Ω respectively. The voltage applied (Vt) is 40V.



a) What is the current in each resistor?

$I_1 = \frac{V}{R} = \frac{40V}{100\Omega} = 0.4A$ $I_2 = \frac{40V}{200\Omega} = 0.2A$

b) What is the power of each resistor?

$P = VI$ $P_1 = (0.4A)(40V) = 16W$ $P_2 = (40V)(0.2A) = 8W$

c) What is the total current delivered by the voltage source?

$I_{TOT} = I_1 + I_2 = 0.4A + 0.2A = 0.6A$

d) What is the power delivered by the voltage source?

$P_{TOT} = 16W + 8W = 24W$ OR $V_{PT} I_{TOT} = (40V)(0.6A) = 24W$

12. A hairdryer with a power of 1500W runs from a voltage supply of 120V

a. What is the resistance of the hairdryer?

$I = \frac{P}{V} = \frac{1500W}{120V} = 12.5A$ $R = \frac{V}{I} = \frac{120V}{12.5A} = 9.6\Omega$

b. How much energy would the hairdryer use if it was operated for 15 minutes every day for 30 days?

$15 min \times 30 = 450 min \div 60 min/hr = 7.5 hr$

$E = P \cdot t = (1500W)(7.5h) = 11250 W \cdot hr$
$= 11.25 kWh$