

Year 9 Science

Solutions

Physics 1 Test: Heat Transfer and Electricity

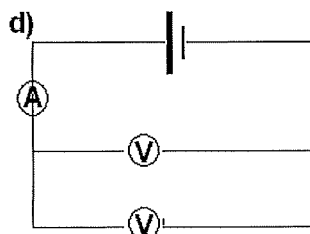
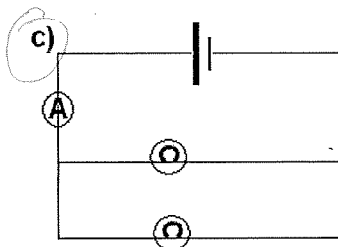
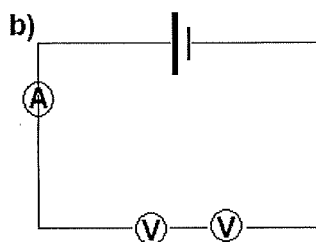
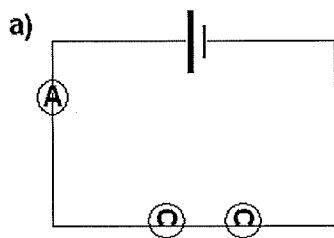
SECTION 1: MULTIPLE CHOICE (1 mark each)

Circle your answer on the multiple choice answer sheet.

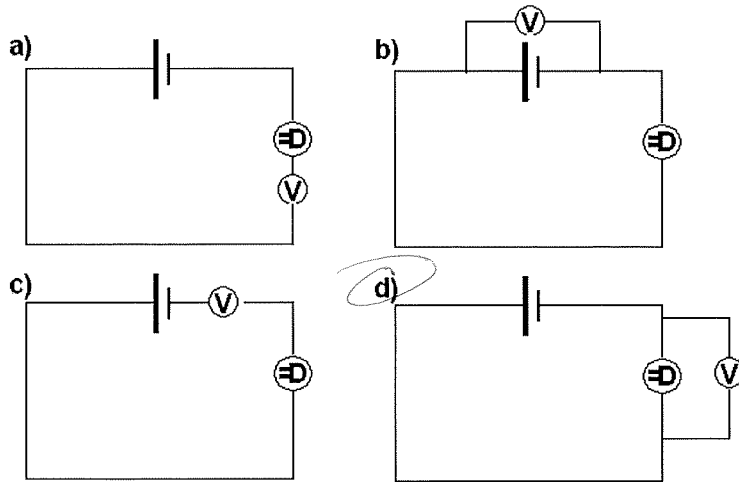
1. Heat moves through space by the process of
 - a) conduction
 - b) convection
 - ☒ c) radiation
 - d) magnetism
2. Convection currents occur due to thermal expansion and differences in density.
Convection transfers heat through
 - a) solids only
 - b) solids and liquids
 - ☒ c) liquids and gases
 - d) gases and empty space
3. Convection currents cause
 - a) sea breezes
 - b) movement of magma within the Earth's crust
 - c) global weather patterns
 - ☒ d) all of the above
4. Electric current is the movement of
 - a) protons
 - ☒ b) electrons
 - c) neutrons
 - d) positrons
5. Electric current is measured in
 - a) joules
 - b) energy
 - c) voltage
 - ☒ d) amperes
6. The potential difference or 'push' a battery gives to energy in a circuit is measured in
 - a) joules
 - b) watts
 - ☒ c) volts
 - d) amps
7. An object with strong positive nuclei that attracts electrons and stops them from moving through it is
 - a) a conductor
 - ☒ b) an insulator
 - c) a battery
 - d) a metal

8. Electrons are small negatively charged particles. Electrons accumulate when a synthetic substance is rubbed against a non-synthetic substance. This results in
- static electricity.
 - current electricity.
 - heat.
 - radiation.
9. How difficult it is for an electron to move through an object or circuit is known as
- resistance
 - joules
 - voltage
 - amperes
10. Which of the following is the most effective electric insulator?
- metal
 - wood
 - ~~air~~ gold
 - empty space
11. A material which easily allows electricity or heat to move through it is called
- an insulator.
 - a conductor.
 - a resistor.
 - a circuit.
12. Which of the following statements about electricity is true?
- $V = I \div R$
 - Resistance slows down the flow of electrons and is measured in ohms.
 - Voltage is the rate of flow of electrons and is measured in amperes.
 - Amplitude pushes electrons and is measured in amps.

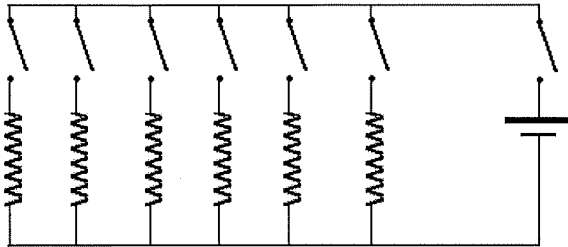
13. Which of the following shows two globes in parallel?



14. A voltmeter is being used to measure the voltage drop across a speaker. Which of these diagrams shows the correct way to use a voltmeter?



15. The circuit diagram below shows how a house would be wired.



The advantage of this kind of wiring is


- a) If one appliance is switched off, they all switch off.
- ☒ b) If one appliance is switched off, you can still use others.
- c) The voltage is divided between each of the appliances, so no one appliance gets too much electricity.
- d) The current is constant all the way around the circuit, so there is always plenty of power for any appliance.

SECTION 2: WRITTEN


Write your answers on the lined paper provided. Show All Working.

1. What do each of the following circuit symbols represent? (8)

a)  resistor

e)  wire

b)  ammeter

f)  light bulb

c)  voltmeter

g)  cell

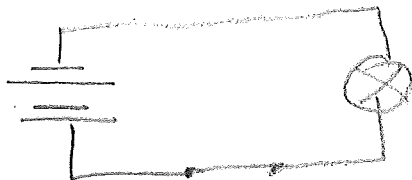
d)  electric bell

h)  switch

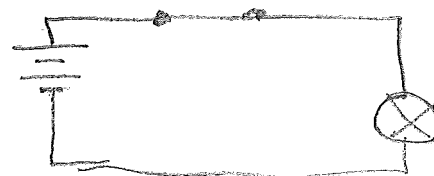
2. Draw a circuit diagram for a torch with two batteries. (3 marks)
3. Describe the similarities and differences between an electric motor and a generator. (3 marks)
4. What current passes through a lamp of resistance $60\ \Omega$ as a voltage of $15\ \text{V}$ is applied across it? (Show all working) (3)
5. A fuse will blow when a current of $8\ \text{A}$ flows through it. If the voltage is $240\ \text{V}$ what is the lowest circuit resistance possible before the fuse will blow? (Show all working) (3)

END OF TEST (OUT OF 35 MARKS)

2



or



Similarities

Both need: coil
magnet

Differences:

E.M requires electric current

Gen requires spinning motion

E.M produces spinning movement

Gen produces an electric current

4

$$V = IR \Rightarrow I = \frac{V}{R} = \frac{15}{60} = 0.25\text{A}$$

5

$$V = IR \Rightarrow R = \frac{V}{I} = \frac{240}{8} = 30\ \Omega \text{ is the lowest resistance}$$