PART A: MULTIPLE CHOICE (10 MARKS)
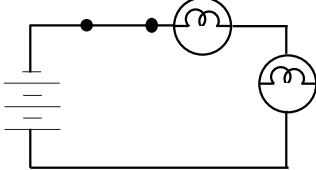Choose the best response in each case and place your answer in the appropriate space on your answer sheet.

1. Which atomic particles are electrically charged?
    (a) electrons and neutrons
    (b) neutrons and protons
    (c) electrons and protons
    (d) electrons, neutrons and protons

2. What type of circuit is shown to the right?
    (a) open
    (b) short
    (c) parallel
    (d) series

3. The term "alternating current" means that the:
    (a) electric current travels in a single direction.
    (b) electric current reverses direction periodically.
    (c) electric current increases and decreases regularly.
    (d) electric current can travel in more than one path.

4. The unit of electric potential difference is the:
    (a) ampere   (b) volt
    (c) ohm   (d) watt

5. According to the "electron-flow" method, when electric current flows in a conductor:
    (a) it is the electrons that move.
    (b) it is the protons that move.
    (c) it is the neutrons that move.
    (d) none of the above.

6. An ammeter is used to measure the current in a circuit. How is it connected?
    (a) in parallel
    (b) in series
    (c) both (a) or (b)
    (d) neither (a) or (b)

7. The unit of electric resistance is the:
    (a) ampere   (b) volt
    (c) ohm   (d) watt

8. A circuit in which an electrical load <u>can</u> be disconnected without affecting other loads is known as a(n):
    (a) parallel circuit.   (b) series circuit.
    (c) short circuit.   (d) open circuit.

9. A current of 0.080 A passing through a human body could be fatal. If you accidentally touched a 110 V supply, what skin resistance will produce a current of 0.080 A?
    (a) 0.00073 Ω (b) 0.080 Ω
    (c) 8.8 Ω (d) 1375 Ω

10. The graphs below show V vs I for various conductors. Which one of the graphs shows an ohmic conductor?
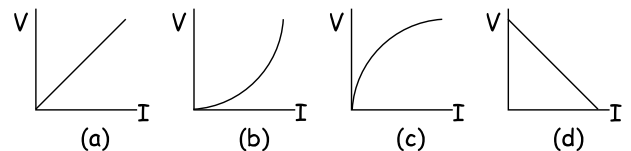
PART B: MATCH (5 MARKS)
Match the definition from the 1st column to the best term in the 2nd column and place the matching letter in the appropriate space on your answer sheet.

1. Measure of the amount of energy per charge.
2. An electrical circuit in which a conductor is connected across a source and bypasses the load.
3. An electrical circuit forming a complete path for the current.
4. An electrical connection in which the current follows two or more paths.
5. Material that prevents the transfer of electric charges.

A) closed circuit
B) conductor
C) electric current
D) electric potential difference
E) electric resistance
F) insulator
G) open circuit
H) parallel connection
I) short circuit
J) series connection

PART A: MULTIPLE CHOICE (10 MARKS)

1	2	3	4	5	6	7	8	9	10

PART B: MATCH (5 MARKS)

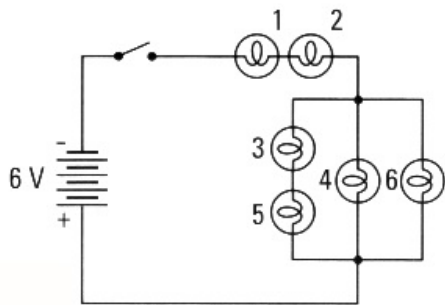| 1	2	3	4	5

PART C: SHORT ANSWER (25 MARKS)

Answer the following questions in the space provided.

{3} 1. What 3 basic parts are required in any simple electric circuit. (Use the correct terminology, not examples of.)

① _____   ② _____   ③ _____

{5} 2. What happens in the circuit diagram below if:

(a) the switch is closed.
_____

(b) the switch is closed and light bulb 1 is unscrewed.
_____

(c) the switch is closed and light bulb 3 is unscrewed.
_____

(d) the switch is closed and light bulb 4 is unscrewed.
_____

(e) the switch is closed, and light bulb 6 is removed and replaced by a copper wire.
_____

{5} 3. Convert the following measurements as indicated, assuming 3 significant digits.

a	655 mA	A
b	0.0425 A	mA
c	125 mV	V
d	126 000 V	kV
e	65 µV	V

{3} 4. Complete the chart below by determining the missing information.

	Resistance (Ω)	Potential Difference (V)	Current (A)
a	15	6.0	
b	24		5.0
c		2.4×10^2	21

{9} 5. Determine the unknown values indicated in the diagram below. Don't forget their units!

$V_1 =$

$I_1 =$

$R_1 = 25\ \Omega$

$V_T =$

$I_T = 2.0\ A$ 100 V

$R_T =$

$V_2 =$

$I_2 =$

$R_2 =$

$V_3 = 20\ V$

$I_3 =$

$R_3 =$
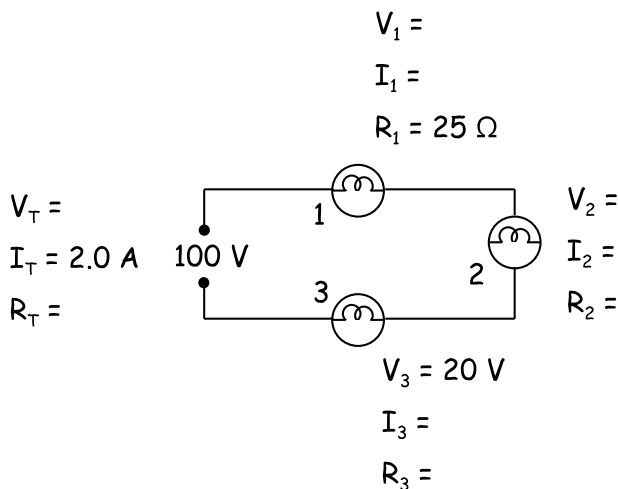
PART D: PROBLEMS (10 MARKS)

Answer the following questions on a separate sheet of paper. You may use the back of this sheet if you wish.

{3} 1. An electric razor has a resistance of 18 Ω and a current of 0.28 A. Calculate the potential drop across the razor.

{4} 2. A handheld video game, operating on 9.0 V, has a current of 7.5 mA. Determine the game's resistance.

{3} 3. An electric can opener used in a 120 V circuit has a resistance of 110 Ω. Calculate the can opener's current.