Science

Grade 10

Current & electricity

* Answer all the questions after studying the lesson " Current electricity "

(Grade 10 part ii pages 140 - 167

Part I

01. Static electricity is,

 i. The charges that are deposited on the surfaces of insulators & do not flow.

 ii. The charges that are deposited on the surface of conductors & do not flow.

 iii. The charges that are deposited on the surfaces of insulators & can flow.

 iv. The charges that are deposited on the surfaces of conductors & can flow.

02.   Which principle is used to make photocopy machine?

    i. Static electric charges   ii. Heat transfer

    iii. Dynamic electricity   iv. Electrolysis

03. Consider the following statements about the current flow through a conductor.

    A – All metals conduct electricity easily.

    B – The reason for electricity to flow easily through metals is the electrons in the valency shell.

    C – When the positive and the negative terminals of a cell are connected by a conductor, the electrons begin to flow from the negative terminal to the positive terminal via the conductor.

    The true statements out of the above are

 i B & C   ii. A & C   iii. A & B   iv. A, B&C

04. The following figure shows how two resistors are connected in series combination in a circuit.
Two ammeters (A1 & A2) and two voltmeters (V1 & V2) are also connected as follows.

    Which answer is correct about the ammeter & voltmeter readings?

	Ammeter reading	Voltmeter
(i)	$A_1 = A_2$	$V_1 = V_2$
(ii)	$A_1 > A_2$	$V_1 = V_2$
(iii)	$A_1 > A_2$	$V_1 < V_2$
(iv)	$A_1 = A_2$	$V_1 < V_2$
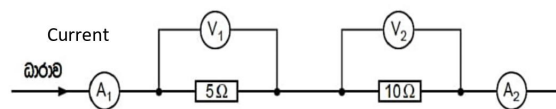
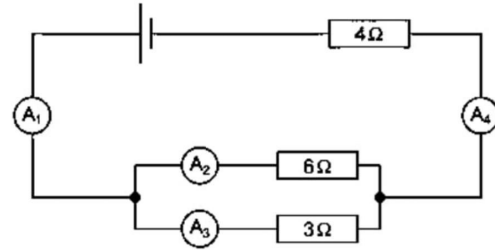05. What is the ammeter reading of the circuit?
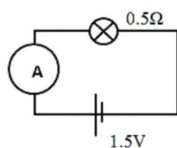
    i. 2A   ii. 7.5A

    iii. 3A   iv. 30 A

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06. In the following circuit reading of A₂ ammeter is 1 A and the reading of A₄ ammeter is 3 A,

    What are the readings of A,& A3 ammeters,

	A$_1$	A$_3$
(i)	2A	1 A
(ii)	3A	2 A
(iii)	3A	1 A
(iv)	1.5 A	0.5 A

07. * Both A and B solids conduct electricity.

    * When the temperature increases the conductivity of A increases.

    * When the temperature increases the conductivity of B decreases.

    Which is the most correct statement about A & B.

    i. A & B are conductors

    ii. A - Semiconductor B - Conductor

    iii. A & B are semi conductors

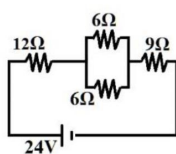   iv. A - conductor B – semiconductor

08. Which of the following is used to measure only the potential difference?

    i. Voltmeter   ii. Multimeter   iii. Galvonometer   iv. Ammeter

09. What is the correct circuit diagram to measure the potential difference of R and the current flow

    through it?
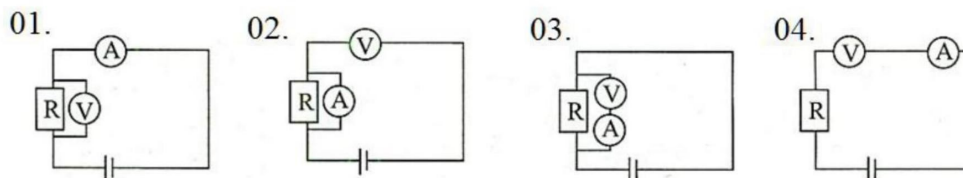
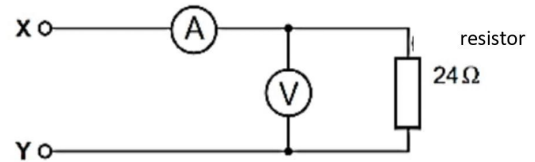10. What is the potential difference across the 12Ω resistor?

i. 3v   ii. 12v

iii. 4V   iv. 9v

3

11. What is the ammeter reading & voltmeter reading when electric supply is connected to the **X** and **Y**.

	voltmeter	Ammeter
(i)	12 V	0.5 A
(ii)	2 V	0.5 A
(iii)	12 V	2 A
(iv)	2 V	6 A

12. Resistance of a 1m long conductor is 2Ω. When it is connected to a cell, 3A current flows through the conductor. Then the conductor is removed and another conductor of 2m length was connected to the same cell, which of the following is the resistance and the current of the second conductor?

|	resistance	Current
(i)	4Ω	1.5 A
(ii)	1Ω	3.0 A
(iii)	4Ω	3.0 A
(iv)	1Ω	1.5 A

13. The following figures show the circuit symbols of three types of resistors. Which answer gives their names in order?
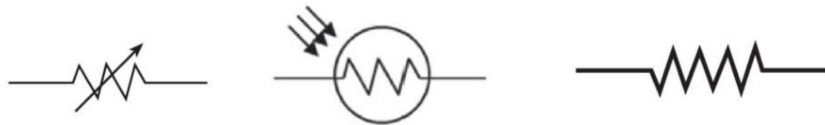
   i. Light dependent resistor, variable resistor, heat dependent resistor.

   ii. heat dependent resistor, Light dependent resistor, Fixed value resistor.

   iii. Fixed value resistor, variable resistor, fixed value resistor.

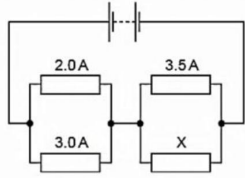   iv. variable resistor, Light dependent resistor, Fixed value resistor.

14. What is the equivalent resistance of the combination of resistors?

(i) 10 Ω   (ii) 14 Ω
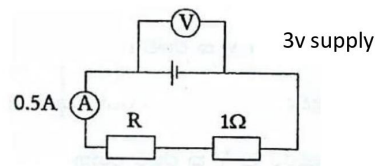
(iii) 8Ω   (iv) 12 Ω
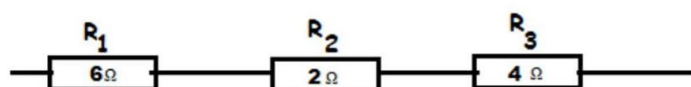
15. Four resistors are connected to two dry cells as shown in the figure. The current passes through three resistors is mentioned. What is the current of x?

i. 2.0A   ii.3.0A

iii.1.5A   iv. 5.0A

16. What is the value of R resistor?
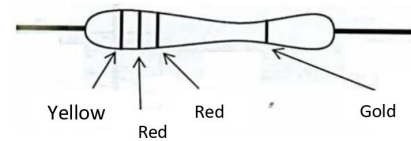
(i) 6Ω
(ii) 4 Ω
(iii) 5Ω
(iv) 3Ω

3v supply

0.5A (A) R   1Ω

17. What is the resistance and the tolerance value of this resistor?

(Yellow -4, Red -2, Gold ± 5%)

(i) 4200Ω $^+_-$5%   (ii) 420Ω $^+_-$10%

(iii) 2400Ω $^+_-$5%   (iv) 720Ω $^+_-$10%

Yellow   Red   Gold
Red

18. Which of the following statement is <u>incorrect</u> about electric conductor?

i. Resistance is indirectly proportional to the area of cross section of the conductor.

ii. The temperature of a conductor does not affect the resistance.

iii. Resistance is directly proportional to the length of the conductor.

iv. Resistance varies according to the material of the conductor.

19. The following figure shows a fixed value resistor. Which colour band shows the tolerance value?

i. Black   ii. Silver

iii. Red   iv. Brown

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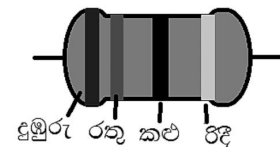
20. Who is the scientist that first discovered the relationship between the current flow through a conductor and the potential difference?

i. Galvani   ii. Michal   iii. Ohm   iv. Newton

21. The graph shows how the flow of current through a conductor varies with the potential difference. What is the resistance of the conductor?

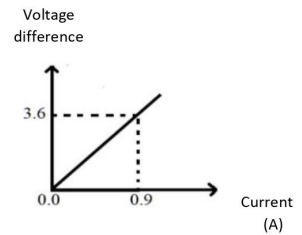(i) 4.0 Ω   (ii) 3.24 Ω

(iii) 4.5 Ω   (iv) 0.25 Ω

Part II

01. (A) Underline the correct word to get a meaningful idea in the following sentences.

   * Static electricity is the stationary charges that are deposited on the surfaces of **(insulators / Conductors)** .
   * When two objects are rubbed the surfaces of either object remove or receive electrons and get charged.
   * If the surface of an object remove or receive electrons it get **(Charged / discharged).**
   * A current of electric charges flowing through a conductor is knows as an electric **(Current/Potential).**
   * The negative terminal of a cell has the ability to **(attract/repel)** electrons. The positive /terminal has the ability to **(attract/repel)** electrons.
   * Whenever a cell is connected to a conductor electrons begin to flow from the **(negative terminal / positive terminal)** of the cell to the **(negative / positive)** terminal via the conductor.

02. This figure shows how to generate an electric current from electro – static charges.
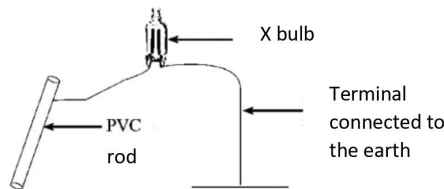
i.   How to charge the PVC rod

....
....

ii.   What is the observation, when the terminal of x bulb touch the charged rod?

....
....

iii.   What is the name used for the flow of static electric charges like that?

....
....

03.

     i.   Write the Ohm's law?

……..
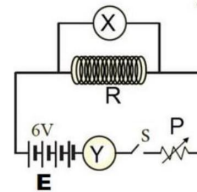
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  ii. The following circuit is used to prove the Ohm's law.

      R is a conductor and **S** is a switch.

     a.   What kind of current is generated by **E** cells.

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     b.   Name X,Y, and P

      X - ………………………….   Y - …………………………….   P - …………………………….

     c.   What is the reading obtained through X?

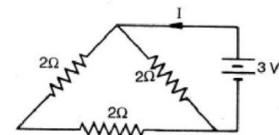……

     d.   At a constant temperature in R , X and Y readings change according to the adjustments of P. If readings of X and Y are a and b respectively , write the mathematical relationship between a and b.

……

04. The following diagram shows a circuit with resistors.

     i.   What is the equivalent resistance of the circuit?

………

………

     ii.   Find the I current flowing through the circuit.

………………………………………………………………………………………………………..

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05. In the following sentences, there are only two correct statements. Put (   ) mark only for the correct statement.
   **Maximum two** (✓) marks can be used and don't put another symbol.

    a.   The electromotive force of a cell is equal to the resistance between the terminals of the cell when electricity is not drawn from the cell. (   )

    b.   An electric current is a flow of electric charges. (   )

    c.   The resistance of a conductor decreases when the cross sectional area is increased. (   )

    d.   Volume control resistor is a type of light dependent resistors. (   )

    e. The equivalent resistance is the resistance of a resistor that could be used in place of all the resistors. (   )

    f. light dependent resistors have a low resistance in the dark. (   )

06. This figure shows a combination of resistors. Circle the correct answer.
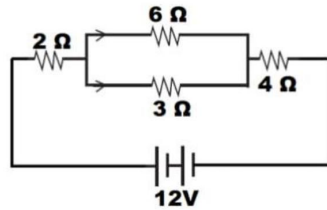
    a. What is the equivalent resistance of this circuit?

        15Ω   8Ω   6Ω   12Ω

    b. What is the current flowing through the 2Ω resistor?

        1.5A   1A   2A   0.8A

    c. What is the total current flowing through the circuit when the 3 resistor is removed?

        1.5A   1A   2A   0.8A