

MULTIPLE CHOICE QUESTIONS.

01. Electricity is the branch of physics that studies the

- a) Behavior of charges at rest b) Behavior of charges in motion c) Neither (a) and (b) d) Both (a) and (b)

02. The device in a circuit that creates the potential difference across the ends of the circuit to facilitate the flow of electrons in the circuit is...

- i) A cell or a battery ii) A dynamo iii) a motor iv) A resistor

OPTIONS;

- a) Both (i) and (ii) b) Both (iii) and (iv) c) Both (i) and (iii) d) Both (ii) and (iv)

03. What generates the potential difference across the terminals of a cell?

- a) The internal resistance of the cell b) The chemical reaction with in the cell c) The electric current of the cell d) The Charges present in the cell.

04. The device that makes a conducting link between the cell and the electric component of the circuit.

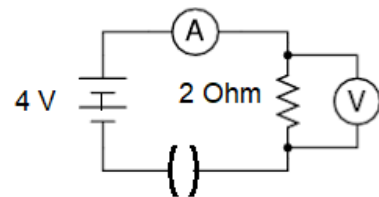
- a) A cell or battery b) An electric bulb c) A switch d) A resistor

05. A continuous and closed path of an electric current is called an

- (a) A wire (b) an electric circuit (c) A circuit diagram (d) both (b) and (c)

06. Look at the circuit and find out the reading in the ammeter and voltmeter.

- (a) 4V and 2 A (b) 2V and 4 A (c) 1V and 1A (d) 0 V and 0 A



07. The electric current is expressed as -

- (a) The amount of charge flowing through a particular area in unit time.
 (b) The amount of work done in moving a charge from one point of the conductor to another
 (c) The energy dissipated by the source in moving the charges across the terminals
 (d) The opposing force offered by the conductor to the flow of charges through it.

08. The number of protons that make +1C of charge

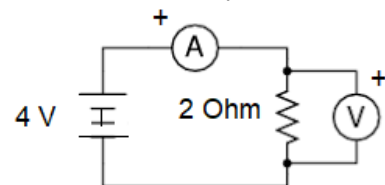
- (a) 1.6×10^{19} (b) 1.6×10^{18} (c) 6.25×10^{19} (d) 6.25×10^{18}

09. If 3.125×10^{16} electrons are drifted across the ends of the terminals of an electric bulb in every 5 sec then the electric current in the bulb is ..

- a) 10 Amp b) 1 Amp c) 1 mA d) 1 μ A

10. What is the measure of current in the given circuit?

- a) 0 Amp b) 2 Amp c) 0.5 Amp d) 8 Amp



For the given question two statements are given under. One is labelled Assertion (A) and other is labelled Reasoning (R) . Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv)

- (i) Both A and R are correct and R is correct explanation for A
 (ii) Both A and R are correct and R is not the correct explanation for A

(iii) A is true but R is false (iv) A is false but R is true

11. Assertion: The conventional direction of electric current in a circuit is from the Positive terminal to the Negative terminal of the source of the circuit.

Reason: It is because in olden days it was believed that the electric current is set by the flow of positively charges

12. Assertion: One Coulomb of charge is constituted by 6.25×10^{18} electrons.

Reason : Charge of an electron is 1.6×10^{-19} C

13. Assertion: In order to maintain the current in a given electric circuit, the cell has to expend its electrical energy stored in it.

Reason : When the cell is connected to a conducting circuit element, the potential difference sets the charges in motion in the conductor.

14. Assertion: An ammeter is always connected in parallel in a given circuit.

Reason : An ammeter has low resistance.

15. Assertion: A voltmeter is always connected in parallel in a given circuit.

Reason : The resistance offered by a voltmeter is high.

16. Assertion: When an ammeter is connected in parallel in a given circuit it will burn.

Reason: The resistance offered by an ammeter is low.

17. Assertion: Ohms law states that the electric current flowing through a metallic wire is directly proportional to the potential difference across its ends provided its temperature remains the same.

Reason : The electric current in the conductor, for the given potential difference, increases with the length of the conductor, decreases with the increase in area of cross section.

18. Assertion: Resistivity is also called as specific resistance.

Reason : Specific resistance is the resistance offered by a cubic conductor of unit volume when electric current flows across two parallel faces normal to it.

19. Assertion : Resistivity of a substance changes only with temperature

Reason : Specific resistance of the substance offered by a conductor is the resistance of the conductor of unit volume when electric current flows across the two parallel faces normal to it.

20. Assertion: Alloys are used in electrical heating devices.

Reason : The resistance offered by a conductor is inversely proportional to the area of cross section of the conductor.

SOLVE THE GIVEN SUMS:

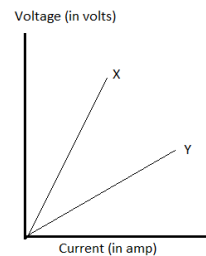
21. How many electrons make 10 Coulomb of charge?

22. If an electric wire is rated 15 Amp calculate how many electrons will pass through the conductor in 10 minutes?

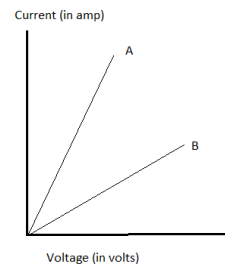
23. An ammeter connected in a circuit shows 4 ampere for 5 minutes and 5 amperes in next 5 minutes. Calculate the total no. of electrons that would have travelled through the ammeter in 10 minutes time.

24. An electronic appliance is rated $20 \mu\text{A}$. Calculate the no. electrons that would travel through it in 5 minutes.
25. How much energy is given to each coulomb of charge passing through a 6 V battery?
26. A battery is rated 12 V. Calculate the amount of energy that has to be spent by the battery to discharge 1.2×10^{40} electrons in a circuit.
27. A battery does a work of 40 Joules of energy in drifting 2.4×10^{20} electrons through a circuit. Calculate the rated voltage of the battery.
28. A battery of 12 V is connected to a coil through an ammeter. The ammeter reads 2 Amp. Calculate the work done by the battery in 10 min in discharging charged particles through the coil.
29. A circuit has a voltmeter, ammeter and a battery rated 20V. In the circuit the voltmeter reads 18V and ammeter reads X and the current is passed for 10min. If the battery does a work of 1800 J in discharging charged particles through the circuit for that time calculate the current in the circuit and the charged particles that are drifted in the circuit in one second.

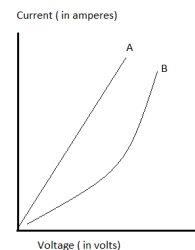
30. There are two resistors A and B whose variation in V and I are plotted as given under. Which of the resistor has higher resistance? Why?



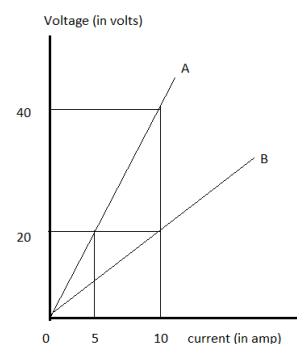
31. Which of the two resistors X and Y of the given graph has higher resistance? Why?



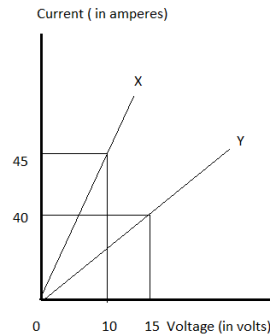
32. Which of the given conductor A or B obey Ohms law? Why?



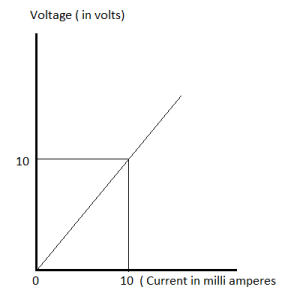
33. Calculate the resistance offered by the resistor A and B.



34. Calculate the resistance offered by the resistor X and Y.



35. Calculate the resistance of the given resistor.



36. An electric heater is rated 200 Volt and 10 Amp. Calculate the resistance offered by the heater.

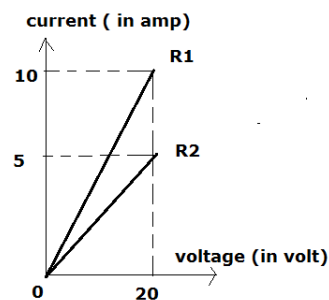
37. If a resistor of one kilo ohm is connected in the circuit the ammeter connected to it reads 5 amp. What is the potential difference across the resistor.

38. A resistor is connected in a circuit across 200 Volt. If 12×10^{22} electrons are moved through the conductor in two minutes calculate the resistance offered by the conductor.

39. A heater coil rated 1 kilo ohm is connected across a source. The source does a work of 10 mega joule in moving 4000 C of charge through the coil. Calculate the current in the coil.

40. Look at the graph and answer the questions:

- Calculate the resistance of R1 and R 2
- Calculate the number of electrons moving through the resistors in five seconds
- Redraw the graph for 40 volts in X axis.



41. A conductor of resistivity 100×10^8 Ohm meter is connected in the circuit. If the length of the conductor is 10 meter and area of cross section is 1 mm^2

- calculate the resistance offered by the conductor.

- (b) How does its resistance change if its length is halved and area of cross section is doubled.
- (c) What happens to its resistance if the temperature of the conductor is increased? Why?
- (d) If this conductor is remoulded such that its length is halved what will be its resistance?

42. A conductor of resistance 100 ohm of length 200 m having area of cross section 2 mm^2 is connected in a circuit
- (a) Calculate the specific resistance offered by the conductor.
 - (b) How does its resistivity change if its length and area of cross section are doubled.
 - (c) What happens to its resistivity if the temperature of the conductor is increased?
 - (d) If this conductor is remoulded such that its length is halved what will be its resistivity?

43. A conductor is connected across the source of 200 V and its resistance offered is 100 ohm. The resistivity of the material of the conductor is $100 \times 10^8 \text{ Ohm meter}$ and its length is 10 meter. Calculate the current in the conductor if the area of cross section of the conductor is 1 mm^2 .

44. A conductor is connected across the source of 200 V and the current in the conductor is 5 amp. The length and area of cross section of the conductor is 10 meter and 1 mm^2 . Calculate the resistivity of the conductor.

45. Calculate the current in the coil of resistance one kilo ohm connected to 200 Volt