PHYSICS

BOOKS - VGS BRILLIANT PHYSICS (TELUGU ENGLISH)

ELECTRIC CURRENT

Review Of Your Previous Knowledge

1. What do you mean by electric current ?

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2. What do you mean by electric current ?

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3. which type of charge (Positive or negative) flows through an electric wire when it is connected in an electric circuit ?

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4. Is there any evidence for the motion of charge in daily life situations ?

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Conceptual Understanding

1. Explain the lorentz - Drude theory.

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2. Explain the lorentz - Drude theory.

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3. How does a battery work ? Explain.

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4. Write the difference between potential difference and emf.

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5. What do you mean by electric shock ? Explain how it takes place.

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6. Derive $\mathrm{R} = \frac{\rho l}{A}$.

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7. Derive a formula that shows the relation between resistance length and area of cross section of a conductor.

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8. What is the relationship between length of a conductor and its resistance ? Write the experimental procedure to verify that relationship.

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9. State Kirchhoff's law for an electrical network. Using these laws deduce the conditions for balance in a wheatstone bridge.

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10. What is the of 1 KWH in joules ?

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11. What happens when this current (overloading) increases greatly to the household circuit ?

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12. Deduce the expression for the equivalent resistance of there resistor connected in series.

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13. Derive $R = R_1 + R_2 + R_3$.

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14. Explain the expression for the equivalient resistance of three resistors which are connected in series.\

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15. The second end of a first resistor is connected to first end of second resistor. Then how are the resistors connected ? Derive the for the resultant resistance of this connection.

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16. Derive an expression for the effective resistance when three resistors are connected in (i) series (ii) parallel.

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17. Derive $\frac{1}{Rp} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$. (Resistors in parallel)

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18. Derive an expression for the effective resistance when three resistors are connected in (i) series (ii) parallel.

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19. Derive an expression for the effective resistance when three resistors are connected in (i) series (ii) parallel.

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20. Silver is a better conductor of electricity than copper. Whey do we use copper wire for conduction of electricity ?

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21. Two bulbs have ratings 100 W, 220 V and 60 W, 220 V. Which one has the greater resistance ?

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22. Why don't we use series arrangement of electical appliances like bulb, television, fan and others in domestic circuits ?

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23. A wire of length 1 m and radius 0.1 mn has a resistance of 100Ω.

Find the resistivity of the material.

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24. Express the units hom in terms in terms of volt and ampere.

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25. What is a conductor of electricity ?

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26. What is non-conductor ?

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27. Define potential difference and give an expression to it.

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28. State Ohm's law.

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29. What are the limitations of Ohm's law ?

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30. What is resistor ?

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31. Define electric circuit.

View Text Solution

32. State Kirchhoff's Junction Law.

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33. State Kirchhoff's Loop law.

View Text Solution

34. Define electric power.

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35. What do you say that two or more resistance are conneted in series ?

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36. When do you say that two or more resistors are connected in series ?

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37. When do you say that two or more resistors are connected in parallel?

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38. What is lattice ?

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39. What is the drift speed of electrons ?

Watch Video Solution

40. Is the voltmeter connected in series or parallel in circuit ? Why ?

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41. State the use of Ammeter. How to connect the Ammeter in electric circuit ?

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42. The home appliance like Fridge ,T.V, Computer are connected in series or parallel ? Why ?

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43. Why are copper wires used as connecting wires ?

View Text Solution

44. Name two special characteristics of fuse wire.

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45. Name two special characteristics of heating coil.

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46. What is Resistance ? What are the SI Units of Resistance ?

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47. When a potential difference 30V is applied across a resistors, it draws a current of 3A. If 20V is applied across the same resistor, what will be the current ?

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48. Is Ohm's law universally applicable for all condcuting elements? If not, give examples of elements which do not obey Ohm's law.

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49. Give reasons for using lead in making fuses.

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50. Define electric current and give an experssion to it.

View Text Solution

51. What is drift speed ?

View Text Solution

52. Define emf.

View Text Solution

53. What are the factors affecting the resistance of a material ?

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54. Calculate the drift speed of electrons in copper wire carrying a current of 1A and cross sectional area $10^{-6}m^2$.

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55. How can we decide the direction of electric current in a conductor ?

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56. A student says "Potential difference and emf are same. Justify your answer.

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57. Define Ohmic and non-ohmic conductors and give two examples each of them.

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58. Derive an expression to find drift velocity of electrons.

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59. Derive $V_d = \frac{1}{nqA}$.

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60. Derive an expression to find the work done by the electric force to move free charges in specified directions.

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61. Derive an expression for the electric potential due to a point charge.

Watch Video Solution

62. Derive an expression to measure of a battery.

Watch Video Solution

63. How do uou appreciate a multimeter ?

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64. Deduce an expression to measure electrc power.

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65. Derive $P = I^2 R$.

View Text Solution

66. Find electric current draw (figure) from the battery of emf 12V.

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Application To Daily Life Concern To Biodiversity

1. How can you appreciate the role of a small fuse in house wiring circuit in preventing damage to various electrical appliance connected in the circuit ?

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2. We can save the household wiring and devices by using fuses. Write any four points by appreciating the role of fuse.

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3. Observe the circuit and answer the questions given below.

Are resistors C and D in series ?

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4. Observe the circuit and answer the questions given below.

Are resistors A and B inf series ?

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5. Observe the circuit and answer the questions given below.

Is the battery in series with any resistors ?

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6. What is the potential drop across the resistors C ?

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7. Observe the circuit and answer the questions given below.

What is the total emf in the circuit if the potential drop across resistor A is 6V ?

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8. A house has three tube lights, two fans and a Television. Each tube light draws 40W. The fan draws 80W and the Television draws 60W. On the average all the tube lights are kept on for five hours, two fans for 12 hours and the television for five hours every day. Find the cost of electric energy used in 30 days at the of Rs. 3.00 per KWH.

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9. Which device is used to measure the current in your pump sets ?

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10. The current resistance of bodies of Karthik and Hemanth are $10,000\Omega$ and $1,00,000\Omega$ respectively. If they touch a current wire with 240 V, who may exerience more effect by an electrical shock ?

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11. What is the use of a multimeter ?

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12. A bulb is marked 60 W and 120 V. How much current does pass through it ?

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13. Which instrument is used to measure electric current ?

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14. What are uses of semi conductors ?

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15. Which instrument is used to measure potential difference or emf ?

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16. Shekhar was observed a bulb and asked some questions to you. Those are

What is the material of the filament ?

View Text Solution

17. Shekhar was observed a bulb and asked some questions to you. Those are

Why does it used as a filament ?

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18. 12 V, 9 V and 12 V bulbs are connected in series. What is the potential difference of their combination ?

View Text Solution

19. 

What is the value of 'x' ?

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20. Jhansi has been using the given devices in her house. Calculate the current bill for one month $\circ 5/-$ per unit.

1. 100 W TV for 12 hrs.

2. 80 W two fans for 10 hrs

3. 11 W four LED bulbs for 12 hrs.

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21. Find the resistance of a bulb, on which 60W and 120 V is marked.

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22. Two wires have equal area of cross section. One is copper and other is Aluminium have the same resistance. Find Which one is longer.

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23. Find which has greater resistance, 1 KW heater or a 100 W tungsten bulb, both marked for 230 V.

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24. A circuit is shown in the picture. The current passing through A is

What is the potential difference between A and B ?

View Text Solution

25. A circuit is shown in the picture. The current passing through A is

What is the equivalent resistance between A and B ?

View Text Solution

26. What do you mean by short circuit ?

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27. A householsd uses the following electric appliances.

i. Refrigerator of rating 400 W each for ten hours each day.

ii. Two electric fans of rating 80 W each for 12 hours each day.

iii. Six electric tubes of rating 18 W each for 6 hours each day. Calculate the electric bill of the of houselod in a month if the cost per unit electric energy is Rs 3.00.

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28. From the adjacent figure

i. Find the potential at D.

ii. Find the current passes through AD, DB and DC.

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29. 

Calculate the equivalent resistance.

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30. 

Calculate the equivalent resistance.

View Text Solution

31. 

Calculate the equivalent resistance.

View Text Solution

32. How do you connect the resistance of $6\Omega, 3\Omega$ and 1Ω to get $R_{eff} = 3\Omega$.

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33. some metals are given

Classify them into insulators and semi conductors.

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34. some metals are given

What material do you observe in (i) a bulb, (ii) a soldering unit, (iii) an iron box, (iv) a diode.

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35. some metals are given

To protect from an electrical shock which material is generally used to cover over a tool ?

View Text Solution

36. some metals are given

Which metals did you observe in your house electrical is wiring ?

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37. 0.5 amp current is passing through the 3 bulbs with $4\Omega, 12\Omega \text{ and } 8\Omega$ resistances and they are connected in series ? Find the voltage of the combination.

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Fill In The Blanks

1. The kilowatt hour is the of .....

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2. A thick wire has ..... Resistance than a thin wire.

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3. A unknown circuit drwas a current of 2 A from a 12 V battery. Its equilatent resitance is .....

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4. The SI unit of potential difference is .....

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5. The SI unit of currents is .....

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6. Three resistors of values $2\Omega, 4\Omega, 6\Omega$ are connected in series. The equivalent resistance of combination of resistors is .....

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7. Three resistors of values $2\Omega, 4\Omega, 6\Omega$ are connected in parallel. The equivalent resistance of combination of resistors is .....

Watch Video Solution

8. The power delivered by a battery of emf, 10 V is 10 W. Then current delivered by the battery is .....

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Multiple Choice Questions

1. A uniform wire of resistance 50Ω is cut into five equal parts. These parts are now connected in parallel in parallel. Then equivalent resistance of the combination is

A. 2Ω

B. 12Ω

C. 250Ω

D. 6250Ω

Answer: A

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2. A charge is moved from a pont A to a point B. The work done to move unit charge duuring this process is called

A. potential at A

B. potential at B

C. potential differece between A and B

D. current from A to B

Answer: C

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3. joule/coulomb is the same as

A. 1 - watt

B. 1 - volt

C. 1 - ampere

D. 1 - ohm

Answer: B

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4. The current in the wire depends

A. only on the potentia difference applied

B. only on the resistance of the wire

C. on potential difference and resistance

D. none of them

Answer: C

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5. A. In series connection, the same current flows through each element.

B. In parallel connection, the same potential difference gets applied across each element.

Which is/are correct ?

A. both a and b are correct

B. a is correct but b is wrong

C. a is wrong but b is correct

D. both a and b are wrong

Answer: A

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6. A. In series connection, the same current flows through each element.

B. In parallel connection, the same potential difference gets applied across each element.

Which is/are correct ?

A. both a and b are correct

B. a is correct but b is wrong

C. a is wrong but b is correct

D. both a and b are wrong

Answer: A

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Try These

1. Write an activity to show the relation between temperature and Resistance.

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2. Why do wi use fuse in household circuit ?

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3. Suppose that you have three resistance each of value 30Ω. How many resistor can you obtain by various combinations of these three resistors ? Draw diagrams in support of your predictions.

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4. Draw a circuit diagram for a circuit in which two resistors A and B are connected in series with a battery and voltmeter is connected to measure the potential difference across the resistor A.

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5. In the below figure, the potential at A is ..... when the potential at B is zero.

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6. If the resistance of your body is 100000Ω, what would be the current that flow in your body when you touch the terminals of a 12V battery ?

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7. A uniform wire of resistance 100Ω is melted and recast into of length double that of the origina. What would be the resistance of the wire formed ?

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Think And Discuss

1. What do you mean by short circuit ?

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2. Why does a short circuit damage electric wiring and devices connected to it ?

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Questions Given In The Lesson 1 Mark Questions

1. Does motion of charge always lead to electric current ?

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2. Take a bulb, a battery, a switch and few insulated copper wires to the terminals of the battery through the bulb and switch. Now switch on the circuit and observe the bulb. What do you notice ?

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3. Can you predict the reson for the bulb not glowing in situations 2 and 3 ?

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4. Why do all materials not act as conductors ?

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5. How does a conductor transfer energy from source to bulb ?

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6. What happens to the motions of electrons when the ends of the conductor are connected to the battery ?

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7. Why do electrons move in specified direction ?

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8. In which direction do the electrons move ?

Watch Video Solution

9. Do the electrons accelerate continuously ?

Watch Video Solution

10. Do they move with a constant speed ?

Watch Video Solution

11. How can we decide the direction of electric current ?

Watch Video Solution

12. How can we measure electric current ?

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13. Wher do the elctrons get energy for their motion from ?

View Text Solution

14. Can you find the work done by the electric force ?

View Text Solution

15. What is the work done by the electric force on uint charge ?

View Text Solution

16. what is the direction of electric current in terms of potential difference ?

View Text Solution

17. Do positive charges move in a conductor ? Can you give an an example of this ?

View Text Solution

18. How does a battery maintain a constant potential difference between its terminals ?

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19. Why does the battery discharge when its positive and negative terminals are connected through a conductor ?

Watch Video Solution

20. What happens when the battery is conneted in a circuit ?

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21. How can we measure potential difference or emf ?

View Text Solution

22. Is there any relation between emf of battery and drift speed of electrons in the conductor connected to a battery ?

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23. Can you guess the reason wh the ratio of V and I in case of LED is not constant ?

Watch Video Solution

24. Do all materials obey Ohm's law ?

Watch Video Solution

25. What is resitance ?

Watch Video Solution

26. Is the value of resistance same for all materials ?

Watch Video Solution

27. Is there any application of Ohm's law in daily life ?

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28. What cause electric shock in the human body ?

Watch Video Solution

29. Do you know the voltage of mains that we use in our household circuits ?

Watch Video Solution

30. What happens to the resistsance of a conductor if we increse its length ?

View Text Solution

31. Does the thickness of a conductor influence its resitance ?

View Text Solution

32. How are electric devices connected in circuits ?

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33. When bulbs are connected (resistors) in series, What do you notice ?

Watch Video Solution

34. What do you notice when bulbs (resotors) are connected in series to the current ?

Watch Video Solution

35. What do you mean by equivalent resistance resitance ?

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36. What happens when the one of the resistor in series breaks down ?

Watch Video Solution

37. Can you guess in what way household wiring has been done ?

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38. How much current is drawn from the battery if the resistors are connected in parallel ? Is it equal to individual currents drawn by resistors ?

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39. How could the sign convention be take ?

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40. You might have heard the sentences like "this month we have consumed 100 units of current". What does 'unit' mean ?

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41. A bulb is marked 60 W and 120 V. What do the values indicate ?

View Text Solution

42. A bulb is marked 60 W and 120 V. What do the values indicate ?

View Text Solution

43. What is the energy lost by the charge in 1 sec. ?

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44. What do you mean by overload ?

View Text Solution

45. Why does it (overloading) cause damage to elelctric appliances ?

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46. What happens when this current (overloading) increases greatly to the household circuit ?

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47. How can we prevent damage due to overloading ?

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Questions Given In The Lesson 2 Mark Questions

1. Why does a bulb glow immediately when we switch on ?

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2. Can we classify the materials based on Ohm's law ?

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3. What happens to our body if touch live wire of 240 V ?

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4. Why doesn't a bird get a shock when it stands on a high voltage wire ?

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Section I 1 2 Marks Questions

1. Which one has free electrons ?

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2. Who proposed that conductors like metals a large number of the free electrons while the positive ions are fixed in their location ?

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3. What is the vaue of net charge moving along a conductor through any cross section, when the conductor is in open circuit ?

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4. Which are respsible for transfer of energy from battery to bulb ?

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5. What is called the ordered motion of electrons in a conductor ?

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6. Write a formula for electric current in the terms of charge (Q) and (t).

View Text Solution

7. What is the SI units of electric current ?

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8. What makes the electrons move in specific direction when the ends of the conductor are connected to the terminals of a battery ?

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9. Which physical quantit is measured in amperes ?

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10. How is the directions of electric field and moment of free electrons ?

View Text Solution

11. Write a formula for electric current in terms of drift speed of electrons.

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12. What is the magnitude of electric charge ?

View Text Solution

13. What is the drift speed of electrons ?

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14. Which apparatus do you use to measure current in your lab ?

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15. State the use of Ammeter. How to connect the Ammeter in electric circuit ?

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16. If Fe is force exerted by electric field on a free charge and 'l' is distance moved by the free charge, what is work done by the electric force on a free charge ?

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17. What do you call the work done by the electric force on unit positive charge to move it ?

Watch Video Solution

18. What is the dircetion of electrons in a circuit ?

View Text Solution

19. What are the parts of battery ?

View Text Solution

20. In battery, which one helps to move the ions in a specific direction ?

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21. Match it.

1)Positively charged plate	(a)anode
2)Negatively charged plate	(b)$cathode$

View Text Solution

22. On which factor the amount of charge accumulated on the plate depends in a battery ?

View Text Solution

23. What do you called the work done by the chemical force to move unit positive charge from negative terminal to positive terminal of the battery ?

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24. emf of a battery $= \frac{W}{q}$, what is 'W' ?

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25. How can you measure potential difference or emf /

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26.

$\text{Potential difference} \times \text{Current} : \text{Electrical Power} : : \text{Power} \times \text{Time} : ?$

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27. What is the law, $\frac{V}{I} =$ constant For a conductor ?

View Text Solution

28. Which device do you use in lab to change electric current ?

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29. The algebralc sum of the increases and decreases in P.D across various components of closed circuit loop must be

a. one

b. zero

c. constant

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30. Draw a graph to show the relation between current (I) and voltage (V) for conductors ?

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31. How is $\frac{V}{I}$ for semi conductors ?

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32. 

Which type of electrical device is used in the experiment ?

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33. What is SI units of resistance of a metal ?

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34. A device passes 1 ampere current at 1 volt of potential difference.

What is the resistance of the device ?

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35. Do all materials obey Ohm's law ?

Watch Video Solution

36. Give example to ohmic material.

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37. What type of material LED ?

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38. According to Ohm's Law many types of materials are there ?

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39. For what materials Ohm's law is not applicable ?

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40. Which one obstructs the motion of electrons in a conductor ?

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41. What is the property of a conductor which is defined as the obstruction to the motion of the elections in a conductor ?

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42. How do we call the material which offers resistance ?

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43. What is the range of resistance of the human body, generally ?

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44. What will happen to resistance of a human body when current flow for a longer time ?

Watch Video Solution

45. What cause electric shock in the human body ?

A. effect of current

B. effect of potential difference

C. effect of resistance of the body

D. combaned effect of a, b, c

Answer: d

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46. Which device do you to measure current, voltage and resistance ?

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47. Which of the following materials do you select to show that the resistance of a conductor depends on the material of the conductor ?

1. Manganin wires of different lengths with the same cross section areas.

2. Manganin wires of equal lengths but different cross sectional areas.

3. Different copper, nichrome, mangnin wires of the length and same cross sectional areas.

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48. What is the relation between resistance (R), resistivity(ρ), length(l) and area of cross section (A) of a conductor ?

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49. What is SI unit of resistivity ?

Watch Video Solution

50. What is conductivity ?

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51. $\text{Resistivity :rho::?:}(\sigma)$

Fill it by sutable word.

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52. A : Copper is used for making electric wires.

R : Metal with low resistivity behave as good conductors.

A. A' and 'R" are correct and 'R' to correct explanation of 'A'

B. A' and 'R' are but 'R' is not correct expplanation of 'A'

C. A' is correct but 'R' is inocorrect

D. A' is incorrent but 'R' is correct

Answer: a

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53. Guess the material which is used in electrical devices and its resistivity and melting point are high.

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54. What is the value of melting point of tungsten ?

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55. What is the range of resistance of insulators ?

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56. Give examples to Alloys.

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57. Name two heating elements.

View Text Solution

58. $\text{Material} - \rho(\Omega - m)$

$A - 1.59 \times 10^{-8}$

$B - 4.60 \times 10^{1}$

$C - 1.00 \times 10^{13}$

Which material is used integrated ciucuits ?

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59.

V_1, V_2, V_3 are voltades, what is resultant voltage (V) ?

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60. If you connect three resistor R_1, R_2 and R_3 in series as shown in the figure, what is the resistance ?

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61. "The sum of indiviual resistance is equal to their equivalent resistance". How is resistors are connected in the cicuit ?

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62. How do household electrical appliancess connect in circuit ?

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63. Two resistors R_1 and R_2 are connected in parallel. What is equivalent resitance ?

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64. How is the resistance of a combination when compared to the resistance of each resistor ?

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65. Write the kerchoffs laws.

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66. Which law states that there is no accumulation of electric charges at any junction in a circuit ?

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67. 

Find the resultant potential difference in the circuit ?

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68. Write a formula for electric power.

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69. $AC: P = VI: : DC: P = ?$

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70. How much resistance can be offered by a bulb, which is marked 60W and 120V ?

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71. What is a bigger unit of power ?

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72. We are using 'units's for measuring current. What does one unit equal ?

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73. How many Joules are equal to one kilo Watt Hour (1KWH) ?

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74. How can we prevent damage due to overloading ?

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75. 100W - 1 fan - 12 hours

9W - 5 LED bulbs - 10 hrs

Calculate power consumption.

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76. What are the units of household electrical energy ?

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77. Which of the follwing has high resistance ?

A. thick wire

B. thin wire

C. length wire

D. short wire

Answer: b and c

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78. Find the equivalent resistance of a device which draw 2A of current at 12V.

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79. Three resistors of values $2\Omega, 4\Omega$ and 6Ω are connected in series. Find the equivalent resistance of combination.

View Text Solution

80. Three resistors of values $2\Omega, 4\Omega$ and 6Ω are connected in parallel. Find the equivalent resistance of combination.

View Text Solution

81. The power delivered by a battery of emf, 10 is 10W. Find the current delivered by the battery.

View Text Solution

82. A uniform wire of resistance 50Ω is cut into five equal parts. These parts now connected in parallel. Find the equivalent

resistance of the combination.

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83. A. In series connection, the same current flows through each element.

B. In parallel connection, the same potential difference gets applied across each element.

Which is/are correct ?

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Section Ii 1 Mark Questions

1. 

Find the quntity of current in the above circuit.

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2. 

Three resistance A, B and C are connected as shown in the figure. Each of them dissipates energy to a maximum of 18 W. Find the maximum current that can flow throug the three resistors.

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3. What happens if we use a fuse made up of same wire which is used to make the electric circuit ?

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4. Draw the electric circuit with the help of a Battery, Voltmeter, Ammeter, Resistance and connecting wires.

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5. Write any two differences between ohmic and non - ohmic conductors.

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6. What happens, if the household electric appliance are connected in series ?

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Asking Questions And Making Hypothesis

1. Why do we consider tungsten as a suitable material for making the filament of a bulb ?

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2. Why do we consider tungsten as a suitable material for making the filament of a bulb ?

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3. Are the headlights of a car connected in series or Parallel ? Why ?

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4. Why should we connect electric appliances in parallel in a household circuit ? What happens If they are connected in series ?

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5. What happens to the free electrons when the conductor are connected to the battery ?

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6. The direction of electric current (I) is oppsite to flow of ..... charge'. Guess the charge. Why ?

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7. There is a force 'x' . Direction of 'x' is opposite to the direction of electrical force : predict x.

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8. Predict the condition of a battery if $F_e = F_e$?

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9. Predict the final outcome in the given experiment.

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10. What will happen if a bird touches both line and neutral wires of 240volts ?

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11. What will if the electrical home appliances are conneted in a series ? Is it suggestible for home ?

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12. Guess the reason for the given situation, not glowing of D, E, F.

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13. The equivalent resistance of three equal resistor is 1.5Ω. The resistance of a single resistor is more than 1.5Ω How would the resistors connected ? Guess without doing the sum.

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14. What will happen if a fuse contains a wire with high melting point ?

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15. Goutham was switched a circuit with a bulb, battery, a switch and wire wire. But it did not glow. Predict the reasons.

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16. What will happen if a uniform electric field is setup throughout the conductor ?

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17. Rithvik does not understand the concep 'drift speed'. To make understand the concept prepare some questions.

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18. In a lab activity to show ther V/I is constant, it was noticed that V/I is not constant. Guess the reasons.

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19. Akshay saw the specification of a bulb as 60 W and 120 V, on the surface of the bulb. She got many doubts in her mind. What would be those double ?

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20. Sangeetha often confused the current and potential differences Ravi explained the terms by asking some questions. What would be those questions ?

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Experimentation And Investigation

1. State Ohm's law. Suggest an experiment to verify it and explain the procedure.

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2. How do you prove experimentally the ratio V / I is a constant for a given conductor ?

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3. What are the material required to make a simple circuit ?

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4. In lab, how do you connect an ammeter to the circuit ?

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5. How do you connect a volt meter to the circuit ?

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6. What is the conlusion in the Ohm's law experiment ?

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Communication Through Drawing Model Making

1. Draw the shape of V - I graph for a conductor.

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2. Draw the shape of V - I graph for semi conductor.

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3. Draw the symbols of the following.

Battery

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4. Draw the symbols of the following.

Resistace

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5. Draw the symbols of the following.

Ammeter

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6. Draw the symbols of the following.

Voltmeter

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7. Draw the symbols of the following.

Key

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8. Draw the symbols of the following.

Rheosistat

View Text Solution

9. Draw the symbol of a fuse.

View Text Solution

10. Draw the symbol of a resistor.

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11. Draw a simple circuit with an ammeter, a voltmeter, a resistors, a key and a battery.

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12. Draw a circuit diagram to verify the Ohm's Law.

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13. Draw V-I garaph of Ohmic and non-ohmic conductors.

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14. Draw a cicuit diagram with a cell, an electric bulb, an ammeter and plug key.

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15. 

Identify the wrongly connected device/s in the given figure.

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16. Draw a simple junction with I_1, I_4 and I_5(into the junction) and $I_2, I(3)$(leaving the junction).

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17. Draw a circuit as mentioned below

i. Total number of resistance are 4. They are 5Ω, 2Ω, 4Ω and 6Ω

ii. 5Ω and $6\Omega$are in parallel

iii. 4Ω and 6Ω are in parallel

iv. 5Ω and 2Ω are in series

v. 2Ω and 4Ω are in series

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18. Draw a loop ACDBA as $-V_2 + I_2R_1 - I_1R_1 + V_1 = 0$.

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19. In an experiment to verify Ohm's Law from the values given below. Draw a graph of 'I' versus 'V'. Show that the graph the graph conforms Ohm's Law and find the resistance of the resistor.

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20. Identify the defects in the circuit. Redraw it.

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21. R_1, R_2 and R_3 resistors are connected in parallel in a circuit with a battery voltmeters and ammeters.

Draw the circuit for the given situation.

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22. Draw a parallel connection of the given devices.

1. Fan (4A)

2. Bulb (2A)

3. Fridge (8A)

4. TV (6A)

5. Fuse (fuse (20A)

6. Heater

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Appreciation And Aesthetic Sense Values

1. Is there any application of Ohm's Law in daily life ?

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2. Which one saves the electrical devices from overloading ?

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3. How do uou appreciate a multimeter ?

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4. Write some of insulators and appreciate them.

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5. How do you appreciate the scientist Ohm for his contribution to electrical field ?

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Section Iii 2 Marks Questions

1. Observe the graph of potential difference (V) drawn between two ens of a conductor and current (I) passing through it. Answer the following questions :

Which law is used to explain the graph ? State it.

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2. Observe the graph of potential difference (V) drawn between two ens of a conductor and current (I) passing through it. Answer the following questions :

What is the resistance of the conductor ?

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3. Draw the experimental set-up to verify V/I is constant for a conductor.

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4. A house has 3 tube-lights of 20 watts each. On the all the tube-light are kept on for five hours. Find the energy consumed in 30 days.

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Experimentation And Field Investigation

1. What are the material required to show that the V/I is a constant for a conductor ?

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2. Describe the activity with the help of diagram to establish the relationship between Current (I) flowing in a conductor and potential difference (V) maintained across its ends.

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3. Show that the semi conductor do not obey Ohm's Law.

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Information Skills And Projects

1. Take a battery and measure the potential difference. Make a circuit and measure the potential difference when the battery is connected in the dircuit. Is there any difference in potential difference of battery ?

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2. Measure the resistance of a bulb (filament) in open circuit with a multi-meter. Make a circuit with elements such as bulb, battry of 12V and key in siries. Close the key. Then again measure the resitance of the same bulb (filament) for every 30 seconds Record the observation in a proper table. What can you conclude from the above results ?

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3. $P = V^2 / R$ is given. What the relation between 'P' and 'V' , P and R ?

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4. i. Water vapour, ii. Silicon, iii. Zinc, iv. Germanium.

Which of the above substances obey the Ohm's law ?

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5. i. Water vapour, ii. Silicon, iii. Zinc, iv. Germanium.

For which of the above $\text{substance} / s\text{the} V / I$ graph is non-linear ?

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6. 

When does occur loss of muscle control ?

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7. 

What is the effect if a body with 24,000Ω touches an electrical wire with 240 volts ?

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8. $R = \frac{\rho l}{A}$

What is ρ ?

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9. $R = \frac{\rho l}{A}$

On what does the resitance of a metal depend ?

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10. 

Where do you place aluminium in the above table ?

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11. 

What is the difference between germanium and glass ?

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12. From the above table,

Which one does pass the electricity ?

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13. From the above table,

which one does not pass the electricity ?

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14. From the above table,

Which substance can use to make insulators ?

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15. From the above table,

Which material has high conductivity ?

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16. Resistivity of some materials are given below.$(\text{Units} = \Omega - m)$

Write any two good solid insulators.

View Text Solution

17. Resistivity of some materials are given below.$(\text{Units} = \Omega - m)$

Write any two good solid conductors.

View Text Solution

18. Resistivity of some materials are given below.$(\text{Units} = \Omega - m)$

Which one has the low melting point among the given materials ?

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19. Resistivity of some materials are given below.$(\text{Units} = \Omega - m)$

Silver and gold are not used in the household electrical wiring. Why ?

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Section Iv 4 Marks Questions

1. State Kirchoff Loop Law and explain.

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Watch Video Solution

2. State Kirchoff Loop Law and explain.

Watch Video Solution

3. 12 V battery is connected in a circuit and to this 4W, 12W, resistors are connected in circuit from this information and the current in the circuit.

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4. A house has four tube-lights, three fans and a television. Each tube-light draws 40 W. The fan draws 80 w and the television draws 100 W. On an average, all the tube-lights are kept on for 5 hours, all fans for 12 hour and the television for 6 hours everyday. Find the

cost of electric energy used in 30 days at the rate of Rs. 3.00 per KWH.

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5. Observe the given circuit.

R_1 and R_2 are two resistors and $R_1 = R_2 = 4\Omega$. Emf of the battery E is 10 V.

Answer the following questions.

How are the resistance R_1 and R_2 connected in the circuit ?

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6. Observe the given circuit.

R_1 and R_2 are two resistors and $R_1 = R_2 = 4\Omega$. Emf of the battery E is 10 V.

Answer the following questions.

What is the potential difference of the circuit ?

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7. Observe the given circuit.

R_1 and R_2 are two resistors and $R_1 = R_2 = 4\Omega$. Emf of the battery E is 10 V.

Answer the following questions.

What is the effective resistance of the circuit ?

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8. Observe the given circuit.

R_1 and R_2 are two resistors and $R_1 = R_2 = 4\Omega$. Emf of the

battery E is 10 V.

Answer the following questions.

What is the total current drawn from the battery ?

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9. 

Observe the above diagram and answer the following.

Are all the resistors connected in parallel or series ?

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10. 

Observe the above diagram and answer the following.

What is the equivalent resistance of the combination of three resistors ?

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11. 

Observe the above diagram and answer the following.

In this system, which physical quantity is constant ?

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12. 

Observe the above diagram and answer the following.

If $R_1 = 2\Omega, R_2 = 3\Omega, R_3 = 4\Omega,$ find equivalent resistance.

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13. What is the relationship between length of a conductor and its resistance ? Write the experimental procedure to verify that relationship.

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14. What are factors affecting the resistance of an electric conductor ? Explain any two factors.

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15. What is the relationship between length of a conductor and its resistance ? Write the experimental procedure to verify that relationship.

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16. In a circuit ,60V battery, three resistance $R_1 = 10\Omega R_2 = 20\Omega$ and $R_3 = x\Omega$ are connected in series. If 1

ampere current flows in the circuit, find the resistance in R_3 by using Kirchhoffs loop law.

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