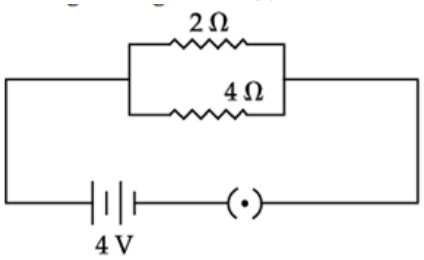
1. Two resistors of 20 Ω and 40 Ω are connected in parallel in an electric circuit. How does the current passing through the resistors compare?
2. State the factors on which the resistance of a cylindrical conductor depends. How will resistance of a conductor change if it is stretched so that its length is doubled?
3. In an experiment to study the relationship between the potential difference across a resistor and the current through it a student recorded the following observations:

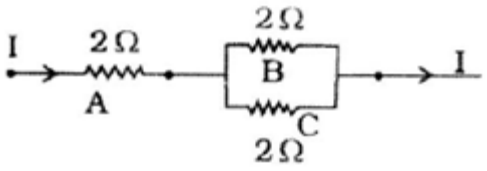
Potential difference (v)	2	3	4.5	5	6
Current (A)	.08	0.12	0.15	0.20	0.24

Find in which one of the above sets of the reading the trend is different from others and must be rejected. Calculate the mean value of resistance of the resistor based on the remaining sets of readings.

4. Define electric current and state its SI unit. With the help of Ohm's law explain the meaning of 1 Ohm resistance.
5. The rating of electric heater is 1100W; 220V. Calculate the resistance when it operates at 220V. Also calculate the energy consumed in KWh in the month of November if the heater is used daily for fours at the rated voltage.
6. An electric lamp of 24Ω, and a conductor of 6Ω are connected in series to a 12V battery. Calculate the
   a) Total Resistance
   b) Total current in the circuit
   c) Potential difference across the conductor
7. a. Explain the function of electric fuse.
   b. An electric bulb is marked 60W. What does this mean. How much energy does it consume if used for 1 hour?
8. Calculate the current flowing through the resistors in given figure.

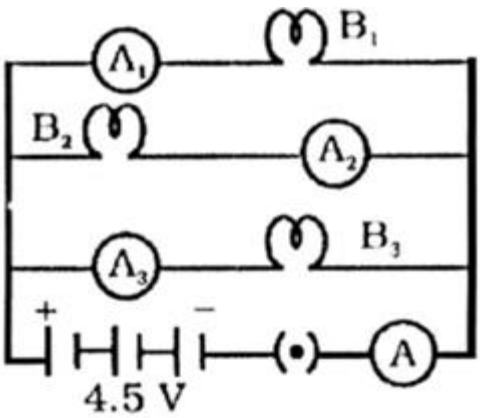


9. Derive an expression for the combination of two resistances connected in series.
10. What is the minimum resistance which can be made using five resistors each of 1/5Ω?
11. Three 2Ω resistors, A,B and C, are connected as shown in Figure. Each of them dissipates energy and can withstand a maximum power of 18W without melting. Find the maximum current that can flow through the three resistors.



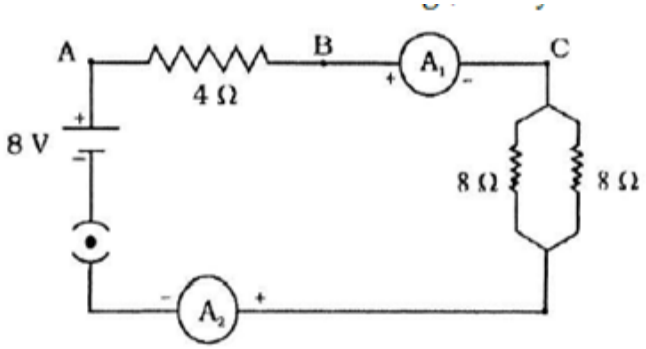
12. B1, B2 and B3 are three identical bulbs connected as shown in the figure. When all the three bilbs glow, a current of 3A is recorded by the ammeter A.

a) What happens to the glow of the other two bulbs when the bulb B1 gets fused?
b) What happens to the reading of A1, A2, A3 and A when the bulb B2 gets fused?



13.a) How much current will an electric bulb draw from a 220V source if a bulb filament is 1200Ω.
b) How much current will an electric bulb draw from a 220V source if the resistance of the heater is 100Ω.

14.Find out the following in electric circuit given in figure.
a) Effective resistance of two 8Ω resistors in the combination
b) Current flowing through 4Ω resistor
c) Potential difference across 4Ω resistance
d) Power dissipated in 4Ω resistor
e) Difference in ammeter readings, if any.



15.A current of 1A flows is a series circuit containing an electric lamp and a conductor of 5Ω when connected to a 10V battery. Calculate the resistance of the electric lamp. Now if a resistance of 10Ω is connected in parallel with this series combination, what change (if any) in current flowing through 5Ω conductor and potential difference across the lamp will take place? Give reason. Draw circuit diagram.

16.Define electric circuit. Distinguish between open and closed circuit.

17.(a)What material is used in making filament of electric bulb?
(b)Name the characteristics which make it suitable for this.

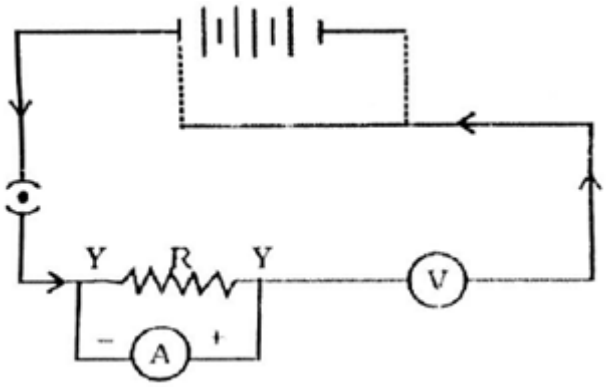
18.Two electric bulb A and B are marked 230V, 40W and 220V,60W respectively. Which one of the two has greater resistance?

19.A piece of wire of resistance 20 Ω is drawn out so that its length is increased to twice its original length. Calculate the resistance of the wire in the new situation.

20.A) What is the total resistance of n resistors each of resistance 'R' connected in:
(i) Series (ii) Parallel
B) Calculate the resultant resistance of 3 resistors 3Ω, 4Ω and 12Ω connected in parallel.

21.A current of 5.0A flows through a 12Ω resistor. What is the rate at which heat energy is produced in the resistor.

22.A child had drawn the electric circuit to study Ohm's law as shown in figure. His teacher told that the circuit diagram need correction. Study the circuit diagram and redraw it after making all correction.



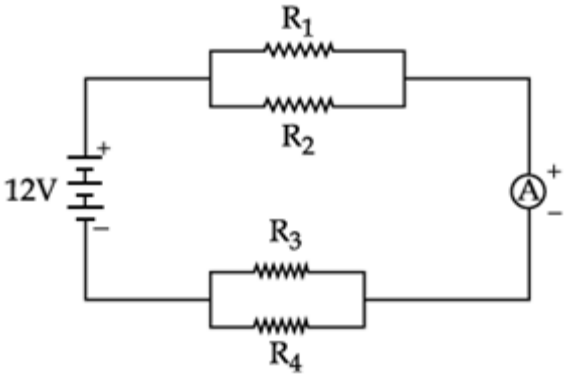
23.How an ammeter is connected in the circuit to measure current flowing through a conductor?

24.Four resistors of 5Ω, 10Ω, 15Ω and 20Ω are connected in parallel. Calculate equivalent resistance.

25.When a 22V battery is connected across a resistor, 2.2mA current flows in the circuit? Find the resistance of the resistor.

26. An electric iron consumes energy at rate of 840 W when heating is at the maximum rate and 360 W when heating is at the minimum. The voltage is 220 V. What are the current and resistance in each case.

27. In figure, R_1=10Ω, R_2=20Ω, R_3=25Ω, R_4=5Ω and a 12V battery is connected to the arrangement. Calculate

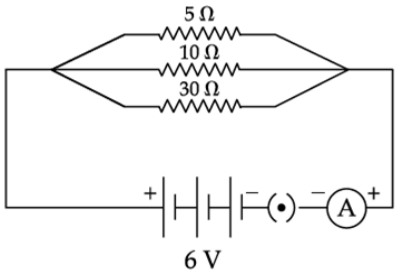


a) Total resistance in the circuit
b) Total current flowing in the circuit.

28. A 400W refrigerator operates for 16hr/day, calculate the cost to operate if for 30 days at Rs 3.40 per Kwh.

29. What is the (a) highest (b) lowest resistance that can be secured by combing four coils of resistance 4 Ω, 8 Ω, 12 Ω, and 24 Ω.

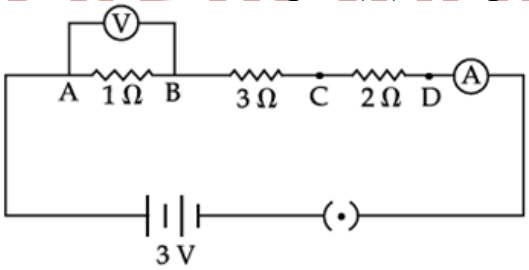
30. In the circuit diagram calculate:



a) The value of current through each resistor
b) The total current in the circuit
c) The total effective resistance of circuit

31. Express joules law of heating mathematically what is the resistance of 12m wire having radius $2X10^{-4}$m, specific resistivity is $3.14 X 10^{-8}$ Ωm.

32. How would the reading of (V) change if it is connected between B and C?



33. Table gives the Resistivity of three samples (in Ωm)

Samples	A	B	C
Resistivity	$1.6 X 10^{-8}$	$1.7 X 10^{17}$	$44 X 10^{-6}$

I. Which of them is good conductor? And which is insulator? And why ?
II. Length of resistance wire (4 Ω resistance) is doubled, calculate the new resistancce of the wire

34. A) Resistors are given as R_1 = 10 Ω, R_2 = 20 Ω, and R_3 = 30 Ω. Calculate the effective resistance when they are connected in series. And calculate the current flowing when the combination is connected to 6V batter.
B) 3 resistors are given as R_1, R_2, and R_3 are connected to a battery V. Draw a circuit diagram showing the arrangement. Derive an experiment for the equivalent resistance of the combination.

35. a) State Ohm's law

b) Draw a circuit diagram for the verification of ohm's law. Also plot graphically the variation of current with potential difference.

c) Calculate the resistance of wire, when a potential difference of 2V is maintained for 1A current to flow through it

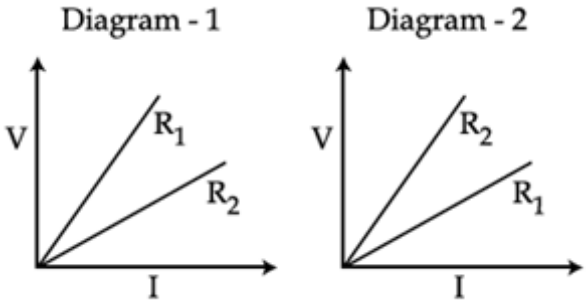
36. A wire is cut into three equal parts and then connected in parallel. How will its:
    a. Resistance b. Resistivity get effected?

37. How many resistor of 88Ω are connected in parallel to carry 10A current on 220V line?

38. Explain the following
    a. Why is Tungsten used for the filament in electric bulbs?
    b. Why are the conductors of electric heating devices, made of an Alloy?
    c. How does the resistance of a wire vary with its cross sectional area.

39. In an electric circuit with a resistance wire and a cell, the current flowing is I. What would happen to this current if the wire is replaced by another thicker wire of same material and same length. Give reason.

40. Two students perform experiments on two given resistors R_1 and R_2 and plot the following V-I graphs. If $R_1 > R_2$, which of two diagrams correctly represent the situation on plotted curves? Justify your answer.



41. In a household electric circuit, different appliances are connected in parallel to one another. Give two advantage of such connection.
    Two bulb rated 100W, 200V and 25W, 200V are connected in parallel to a 200 V supply. What will be current drawn from the supply line?

42. State the law that relates current through a conductor and potential difference between its ends. Represent the law mathematically.

43. Will current flow more easily through a thick wire or a thin wire of the same material when connected to the same source? Why? Name the factors on which resistance of wire depends?

44. An electric lamp is marked 220V, 100W. It is used for 5 hours daily. Calculate
    a. Its resistance while glowing
    b. Energy consumed in KWh/day.

45. A. State ohm's law. Express it mathematically.
    B. Write symbol used in electric circuit to represent:
    (i) Variable resistance (ii) Voltmeter
    C. An electric bulb is rated 220V and 100W. When it is operated on 110 V, what will be the power consumed?

46. A. Why is the series arrangement not used for domestic circuits?
    B. Why is the tungsten used almost exclusively for filament of electric lamps?

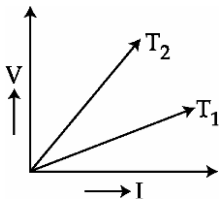
C. Why are the conductors of electric heating devices such as bread toasters and electric irons made of an alloy rather than a pure metal?

D. Why are copper and aluminium wires usually employed for electricity transmission?

E. Why does the cord of an electric heater not glow while the heating element does?

47. Two conducting wire of same material, equal length and equal diameter are first connected in series. How does the heat produced by the combination of resistance change?

48. The voltage - current (V-I) graph of a metallic conductor at two different temperature T1 and T2 is shown below. At which temperature is the resistance higher?



49. Two conducting wires of same material, equal length and equal diameter are first connected in series and then in parallel. Compare the equivalent resistance in two cases.

50. When do you say that the resistance of a wire is 1 Ω?

51. What precautions should be taken to avoid overloading of domestic electric circuits?

52. Two electric lamps rated 100 W, 220V and 25W, 220V are connected in parallel to a 220V supply. Calculate the total electrical current in the circuit.

53. Draw a schematic diagram of a circuit consisting of 24 V battery, a 10 ohm resistor, a 5 ohm resistor, a 1 ohm resistor, an ammeter and a plug key all connected in series. Find the ammeter reading and potential difference at the ends of 10 Ω resistor.

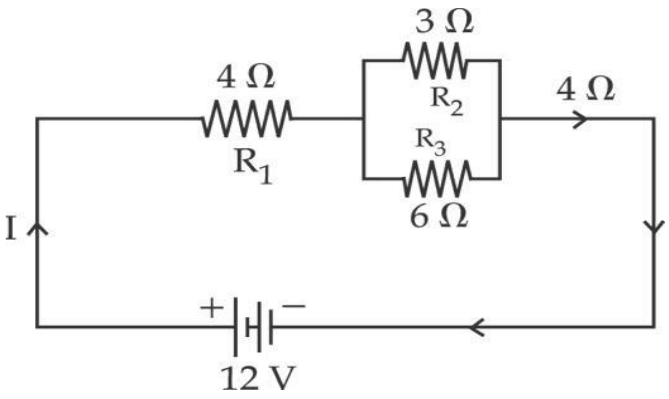
54. Why are the heating elements of electric toaster and electric iron made of an alloy rather than pure metal?

55. An electric iron of resistance 20 Ω takes a current of 5 A. Calculate the heat developed in 30 seconds.

56. Define 1 kWh. How is this unit of energy related to 1 joule ?

57. The following circuit diagram shows the combination of three resistors R1, R2 and R3. Find

I. total resistance of the circuit,
II. total current (I) flowing in the circuit and the
III. potential difference across R1.



58. Aluminium wire has radius 0.25mm and length of 75 m. If the resistance of the wire is 10 Ω, calculate the resistivity of aluminium.

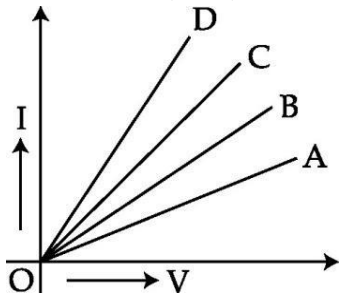
59. Two identical immersion heaters are to be used to heat water, in a large container. Which one of the following arrangement would heat the water faster : (i)

connecting the heaters in series with the main supply, (ii) connecting the heaters in parallel with the main supply ? Give reasons for your answer.

60. The resistance of a resistor is kept constant and the potential difference across its two ends is decreased to half of its former value. State the change that will occur in the current through it.
61. An aluminium can is used to store ferrous sulphate solution. It is observed that in a few days holes appeared in the can. Explain the cause for this observation and write chemical equation to support your answer.
62. State the relationship between 1 ampere and 1 volt.
63. Why is it not advisable to handle domestic electrical circuit with wet hands ?
64. Name the property by virtue of which two conductors having identical structures offer different resistances to the flow of current when connected to the same source of electric current.
65. When connected to a 10 V battery a current of 1 ampere flows in a circuit containing an electric lamp and a conductor of 5 Ω in series. Calculate the resistance of the electric lamp. Now if a resistance of 10 Ω is connected in parallel with this series combination, what change (if any) in current flowing through 5 Ω conductor and potential difference across the lamp will take place? Give reason. Draw circuit diagram.
66. (i) What precaution should be taken to avoid the overloading of domestic electric circuits?

(ii) An electric oven of 2 kW power ratinf is operated in a domestic electric circuit, that has a current rating 5A. If a supply voltage is 220V, what do you expect? Explain.

67. State Ohm's law and write the condition in which this law is obeyed ?
68. The element of an electric heater becomes red hot when the current is switched on while it is not so for the current carrying wires in the circuit. Explain, why ?
69. Study the V-I graph for four conductors A,B,C and D having resistance R_A, R_B, R_C and R_D respectively, and answer the following questions :



(i) Which one of these is a best conductor ?
(ii) If all the conductors are of same length and same material, which is the thickest ?
(iii) If all the conductors are of same thickness and of same material which is the longest ?
(iv) If the dimensions of all the conductors are identical, but their materials are different which one would you use as (a) resistance wire (b) connecting wire
(v) Which one of the following relations is true for these conductors
(a) RA >RB>RC>RD (b) RA <RB<RC<RD
(c) RA =RB=RC=RD (d) RA = RB< RC<RD
(vi) If conductors A and B are connected in series and V-I graph is plotted for the combination, its slope would be
(a) Less than that of A (b) more than that of A

(c) between A and B (d) More than that of D

(vii) If conductors C and D are connected in parallel and V-I graph is plotted for the combination, its slope would be

(a) Lesser than that of A (b) More than that of D

(c) Between C and D (d) Between B and C

70. How much current will an electric bulb draw from a 220V source, if the resistance of the bulb–filament is 1200 ohms ?

71. Calculate the electrical energy consumed by a 1200W toaster in 20 minutes.

72. Two identical resistor, each of resistance 20 Ω are connected (i) in parallel (ii) in series, in turn, to a battery of 10 V. Calculate the ratio of power consumed in the combination of resistors in the two cases.

73. Two resistor of resistance 3 Ω and 6 Ω respectively are connected to a battery of 6 V so as to have

(a) minimum resistance (b) minimum current

(i) How will you connect the resistances in each case?

(ii)Calculate the strength of the current in the circuit in both cases.

74. A 9 Ω resistance is cut into three equal parts and connected in parallel. Find the equivalent resistance of the combination.

75. State the change in the ammeter reading observed when a resistance wire in a circuit is replaced by a wire of same material and same length but comparatively double cross- sectional area keeping the source of potential difference constant.

76. A current of 5.0 A flows through a 12ohms resistor. What is the rate at which heat energy is produced in the resistor?

77. (a) Why do copper or aluminium wires generally used for electrical transmission and distribution purposes?

(b) Two wires, one of copper and other of manganin, have equal lengths and equal resistances. Which wire is thicker ? Given that resistivity of copper is lower than that of manganin.

78. Resistance of a metal wire of length 1m is 26 Ω at 20°C. If the diameter of the wire is 0.3mm, what will be the resistivity of the metal at that temperature?

79. Briefly explain an activity to plot the magnetic field lines around a straight current carrying conductor. Sketch the field pattern for the same, specifying current and field directions. What happens to this field,

I. if the strength of the current is decreased?

II. if the direction of the current is reversed?

80. Name the physical quantity which is same in all the resistors when they are connected in series.