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THE GURUKUL INSTITUTE

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CLASS X

ASSIGNMENT ON ELECTRICITY

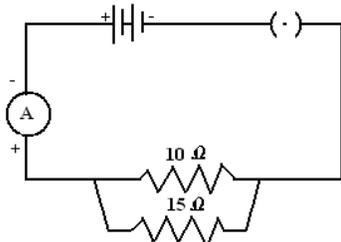
1. Calculate the number of electrons constituting one-coulomb of charge.
2. Write the S.I unit of:
 - a) Electric charge is.....
 - b) Electric current is.....
 - c) Voltage is
 - d) Resistance is.....
 - e) Resistivity is.....
3. What is meant by saying that the potential difference between points is 1V?
4. How much energy is given to each coulomb of charge passing through a 6V battery?
5. On what factors does the resistance of a conductor depend?
6. Will current flow more easily through a thick wire or a thin wire of the same material, when connected to the same source, why?
7. Why are coils of electric toaster and electric iron made of an alloy rather than a pure metal?
8. When a 12V battery is connected across an unknown resistor, there is a current of 2.5mA in the circuit. Find the value of the resistance of the resistor.
9. A battery of 9V is connected in series with resistor of 0.2Ω , 0.3Ω , 0.4Ω , 0.5Ω and 12Ω respectively. How much current would flow through the 12Ω resistor?
10. A copper wire has diameter 0.5 mm and resistivity of $1.6 \times 10^{-8}\Omega\text{m}$. What will be the length of this wire to make its resistance 10Ω ?
11. Show how would you connect three resistors each of resistance 6Ω , so that the combination has a resistance of (a) 9Ω (b) 4Ω
12. Two lamps one rated 100W at 220V and other 60W at 220V are connected in parallel to electric main supply. What current is drawn from the line of supply voltage?
13. Which uses more energy, a 250W T.V. set in 1hour, or a 1200W toaster in 10min?
14. What is the shape of V-I graph for a metallic wire.
15. In which arrangement, series or parallel are various electrical devices connected in the domestic lighting circuit.
16. Should the heating element of an electric iron be made of iron, silver or nichrome wire?
17. How does the resistance of a wire depend on its length?
18. A current of 0.2A passes through a resistance of 20Ω , what is the potential difference across it.
19. What is an ammeter and a voltmeter.
20. How is power related to current and voltage?
21. Which physical quantity is measured in 1KWh?
22. How many Jules are equal to 1KWh?
23. Out of 60W and 40W lamps, which one has a higher electrical resistance when in use?
24. Three resistances of 2Ω , 4Ω and 6Ω respectively are joined in series with a battery of 6V. Draw the circuit diagram and find the value of current flowing.
25. A bulb is rated at 5.0V, 100mA. Calculate it's a) power b) resistance
26. Find the value of 1KWh in joules.
27. An electric bulb is rated 220V and 100W, when it is operated at 110V. What will be the power consumption?
28. An electric lamp is marked 100W, 220V. It is used for 5hrs daily, calculate

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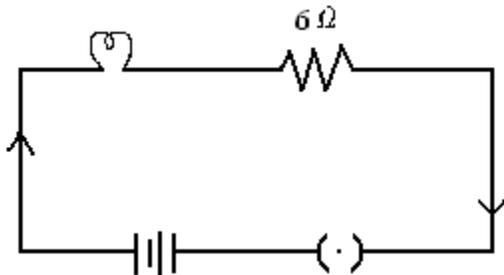
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- a) Its resistance while glowing.
- b) Energy consumed in KWh per day.

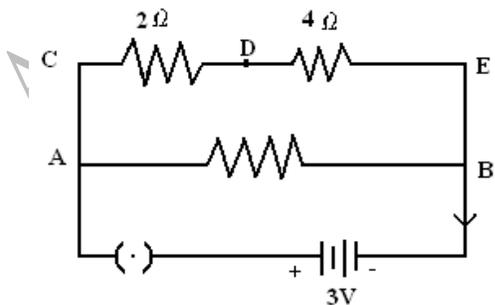
29. Study the following circuit and answer:



- a) State the type of combination of the two resistors in the circuit.
 - b) How much current is flowing through (i) 10Ω (ii) 15Ω
 - c) What is the ammeter reading?
30. Find the cost of electricity for running an electric motor 1h.p (746 W) for 5 hours a day, at the rate of Rs. 1.50 per unit for the month of November.
31. An electric bulb is rated as 50 W, 220 V. Calculate the energy consumed by the bulb in 20 min. Express your answer in commercial unit of electric energy.
32. An electric refrigerator rated 400W operate 8hrs per day. What is the cost of the energy to operate it for 30 days at Rs. 3.00 per KWh?
33. Two room heaters one marked 220V, 500W and 220V, 800W respectively. If the heater are connected in parallel to 220V main supply, calculate
- a) The current drawn by each heater
 - b) The resistance of each heater
 - c) Total electric energy consumed in commercial units if they operate simultaneously for 2 hrs.
34. In the given circuit, calculate:

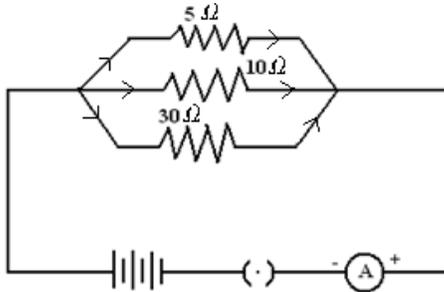


- a) Total resistance of the circuit
 - b) Current flowing through circuit
 - c) Potential difference across the lamp.
35. In the circuit :



- a) Total resistance in the arm CE
- b) Total current from the battery.

- c) Current in each arm i.e AB and CE of the circuit.
36. Draw a schematic diagram of a circuit consisting of a battery of five 2V cells, a 5Ω resistor, 10Ω resistor and a 15Ω resistors and plug key all connected in series.
- a) Calculate the electric current passing through the above circuit when the key is closed.
37. For the circuit diagram given below



- a) Find the value of current through each resistor.
- b) Find the total current in the circuit
- c) The total effective resistance of the circuit.
38. If $R_1 = 10$, $R_2 = 40\Omega$, $R_3 = 20\Omega$, $R_5 = 60\Omega$ and 12 V battery is connected to the arrangement. Calculate (a) the total resistance (b) the total current flowing in the circuit. (R_1 , R_2 are parallel and R_3 , R_4 , R_5 are parallel).
39. In given circuit calculate :
- a) The total resistance of the circuit,
- b) Current shown by the ammeter.