

Octahedral classes, kharadi
2nd floor, yashwant plaza, near bank of India,

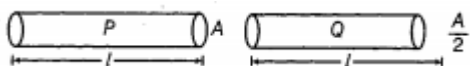
Class 10 - Science
electricity

Maximum Marks: 59

Time Allowed: 2 hours

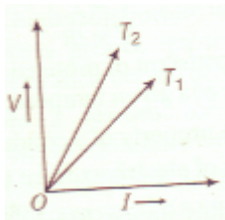
Section A

1. When two ends of a metallic wire are connected across the terminals of a cell, then some potential difference is set up between its ends. In which direction electrons are flowing through the conductors?
2. A student using the same two resistors, ammeter, voltmeter, and battery, makes two circuits connecting the two resistors first in series and second in parallel. If the ammeter and voltmeter readings in both the cases be I_1 , I_2 , and V_1 , V_2 , respectively. Write his observations.
3. What do you understand by the term fuse in an electric circuit?
4. What is SI unit of resistivity ?
5. You have two metallic wires of resistances 6Ω and 3Ω . How will you connect these wires to get an effective resistance of 2Ω ?
6. What causes the potential difference between the two terminals of a cell?
7. Define the term “volt”?
8. What constitutes the current ?
9. How many joule are there in 1 kWh?
10. Name a device that helps to maintain a potential difference across a conductor.
11. How is a voltmeter connected in the circuit to measure potential difference between two points?
12. Nichrome is used to make the element of electric heater. Why?
13. Out of the two wires P and Q shown below which one has greater resistance?
Justify it.

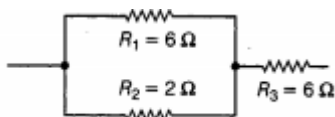


14. Write the relation between heat energy produced in a conductor when a potential difference V is applied across its terminals and a current I flows through it for time t .
15. What is SI unit of resistance ?

16. What happens to the other bulbs in a series circuit, if one bulb blows off?
17. Why closed path is required for the flow of current?
18. Which of the following terms does not represent electrical power in the circuit?
 - (a) I^2R ;
 - (b) IR^2 ;
 - (c) VI
 - (d) $\frac{V^2}{R}$?
19. Resistance of an incandescent filament of a bulb is comparatively much more than that when it is at room temperature. Why?
20. Find the minimum resistance that can be made using five resistors each of $\frac{1}{5}\Omega$.
21. Which material is best conductor?
22. The voltage-current (V-I) graph of a metallic circuit at two different temperatures T_1 and T_2 is shown in figure. Which of the two temperatures is higher and why?



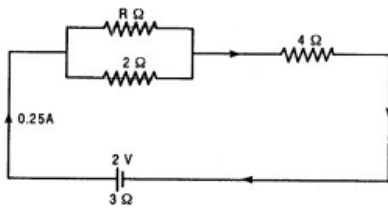
23. What is the direction of electronic current ?
24. The given figure shows three resistors



Find the combined resistance.

25. A wire of resistivity ρ is pulled to double its length. What will be its new resistivity?
26. A current of 1A is drawn by a filament of an electric bulb. What would be the number of electrons passing through a cross-section of the filament in 16s?
27. What is measured by an ammeter ?
28. Draw a circuit diagram using a battery of two cells, two resistors of 3Ω each connected in series, a plug key and a rheostat.
29. In how much time will a bulb of 100 W consume the energy of 2 kWh?
30. What is specific resistance or resistivity ? Upon what factors does it depend ?
31. what is electric energy ? what is its practical unit ?

32. What is the need of combining different resistors? What is the resultant resistance when a number of resistances are connected in series?
33. The following circuit diagram shows three resistors 2Ω , 4Ω , $R\Omega$ connected to a battery of e.m.f. $2V$ and internal resistance 3Ω . A main current of $0.25A$ flows through the circuit.
- What is the P.D. across 4Ω resistor.
 - Calculate P.D. across the internal resistance of the cell.
 - What is the potential difference across $R\Omega$ and 2Ω resistors ?
 - Calculate the value of R .



34. (a) Define electrical energy with the S.I. unit?
 (b) A household uses the following electric appliance:
 (i) Refrigerator of rating $400W$ for ten hours each day.
 (ii) Two electric fans of rating $80W$ each for twelve hours each day.
 (iii) Six electric tubes of rating $18W$ each for six hours each day.
 Calculate the electricity bill of the household for the month of June if the cost per unit of electric energy is ₹3.00
35. Three equal resistors each equal to r and connected as shown in Fig. Calculate the equivalent resistance.

