

A Very Short Answer Type Questions

- Q.1 Define current.
- Q.2 Define one ampere.
- Q.3 What is the conventional direction of electric current? How does it differ from the direction of flow of electrons?
- Q.4 What do you mean by elementary charge?
- Q.5 State Ohm's law.
- Q.6 Define one ohm.
- Q.7 Write the formula for resistance of a wire of length l and cross-section A .
- Q.8 Define specific resistance.
- Q.9 Write the unit of specific resistance.
- Q.10 Distinguish between resistance and resistivity.
- Q.11 Two resistors R_1 and R_2 are joined in series. Find the equivalent resistance.
- Q.12 Two resistors R_1 and R_2 are joined in parallel. Find the equivalent resistance.

- Q.20 A Piece of wire is redrawn by pulling it until its length is doubled. Compare the new resistance with the original value.

C Long Answer Type Questions

- Q.21 Define charge. What do you understand by positive and negative charge? Write down the expression for force between two charges.
- Q.22 State Ohm's law. How it can be verified experimentally?
- Q.23 Describe the conditions for constituting an electric current. Explain the mechanism of flow of electrons in a conductor.
- Q.24 Derive the expression for the equivalent resistance when two resistors are joined in series.
- Q.25 Derive the expression for the equivalent resistance when two resistors are joined in parallel.

D Numerical Problems

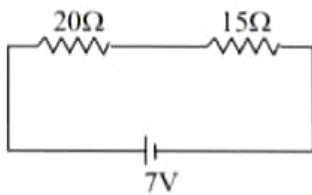
- Q.26

resistance of the combination is 4.8 ohms. What is the resistance X?

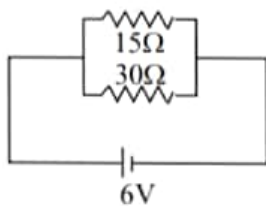
Q.31 Three resistances 12 ohms each are connected in parallel. Three such combinations are connected in series. What is the total resistance?

Q.32 How will you connect three resistors of 3 Ω , 4 Ω and 7 Ω respectively so as to obtain a resultant resistance, of 3.5 Ω ?

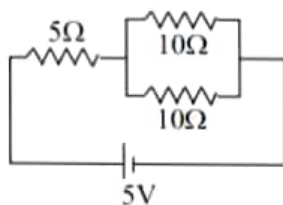
Q.33 Find the current through the circuit shown in figure. Also find the potential difference across the 20- Ω resistor.



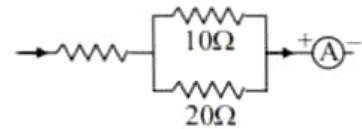
Q.34 Find (a) the equivalent resistance, (b) the current passing through the cell, and (c) the current passing through the 30- Ω resistor in the circuit shown in figure.



Q.35 Find the current supplied by the cell in the circuit shown in figure.



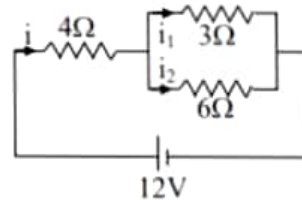
currents through the 10- Ω and 20- Ω resistors.



Q.37 Three resistors of resistances 10 Ω , 20 Ω and 30 Ω are connected in parallel with a 6-V cell. Find (a) the current through each resistor, (b) the current supplied by the cell, and (c) the equivalent resistance of the circuit.

Q.38 When two resistors are joined in series, the equivalent resistance is 90 Ω . When the same resistors are joined in parallel, the equivalent resistance is 20 Ω . Calculate the resistances of the two resistors.

Q.39 Consider the circuit shown in figure. Calculate the current through the 3- Ω resistor.



Q.40 (a) How will you join three resistors of resistances 4 Ω , 6 Ω and 12 Ω to get an equivalent resistance of 8 Ω ?
 (b) What would be the highest and the lowest equivalent resistances possible by joining these resistors?

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B Short Answer Type Questions

- Q.13 Define current. Is it a scalar quantity or a vector quantity? What is meant by the conventional direction of current?
- Q.14 Define resistance.
- Q.15 On what factors does the resistance of a conductor depend?
- Q.16 Define resistivity. Write the formula for resistivity.
- Q.17 What is the formula for the combination of resistances when they are combined in :
(i) series and
(ii) parallel?
- Q.18 Why is the series arrangement not used for domestic circuits?
- Q.19 How does the resistance of a wire vary with its cross-sectional area?

resistance with the original value.

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D Numerical Problems

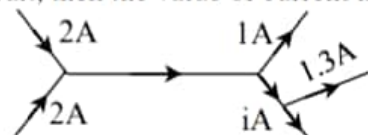
- Q.26 If the charge on an electron be $1.6 \times 10^{-19} \text{ C}$, how many electrons should pass through a conductor in 1 second to constitute 1 ampere current?
- Q.27 How many electrons pass through a lamp in one minute if the current be 200 mA?
(Charge on an electron, $e = 1.6 \times 10^{-19} \text{ C}$.)
- Q.28 A conductor carries a current of 0.2A. Find the amount of charge that will pass through the cross-section of the conductor in 30 s. How many electrons will flow in this time-interval?
(Charge on an electron, $e = 1.6 \times 10^{-19} \text{ C}$.)
- Q.29 The potential difference between the two points of a wire carrying 2 amperes current is 0.1 volt. Calculate the resistance between these points.

Single Correct Answer Type Questions

- Q.1** How many electrons in 1 s constitute a current of 1 A?
 (A) 6.25×10^{18} (B) 6.25×10^{12}
 (C) 6.25×10^{11} (D) 6.25
- Q.2** 1 Coulomb is equal to -
 (A) 1 amp \times 1 sec
 (B) 1 amp / 1 sec
 (C) 1 joule \times 1 amp
 (D) 1 joule / 1 sec
- Q.3** When a body is negatively charged by friction, it means-
 (A) the body has acquired excess of electrons
 (B) the body has acquired excess of protons
 (C) the body has lost some electrons
 (D) the body has lost some neutrons
- Q.4** If a charged body attracts another body, the charge on the other body-
 (A) must be negative
 (B) must be positive
 (C) must be zero
 (D) may be negative or positive or zero
- Q.5** A suitable unit for expressing the strength of electric field is -
 (A) V/C (B) C/m
 (C) N/C (D) C/N
- Q.6** One ampere equals -
 (A) $10^6 \mu\text{A}$ (B) $10^{-6} \mu\text{A}$
 (C) $10^{-3} \mu\text{A}$ (D) 10mA
- Q.7** What constitutes current in a metal wire ?
 (A) Electrons (B) Protons
 (C) Atoms (D) Molecules
- Q.8** If I is the current through a wire and 'e' is the charge of electron then the number of electrons in t seconds will be given by -
 (A) $\frac{Ie}{t}$ (B) e/It
 (C) It/e (D) Ite

- Q.9** Conventionally, the direction of the current is taken as-
 (A) the direction of flow of negative charges
 (B) the direction of flow of atoms
 (C) the direction of flow of positive charges
 (D) the direction of flow of molecules

- Q.10** Figure shows, current in a part of electrical circuit, then the value of current is-



- (A) 1.7 A (B) 3.7 A
 (C) 13 A (D) 1.0 A

- Q.11** When the temperature of a metallic conductor is increased its resistance-
 (A) always decrease
 (B) always increase
 (C) may increase or decrease
 (D) remain the same

- Q.12** Specific resistance of wire depends upon-
 (A) its length (B) its cross-section area
 (C) its dimensions (D) Its material

- Q.13** The unit of resistivity is-
 (A) ohm (B) ohm mete
 (C) ohm meter⁻¹ (D) mho metre⁻¹

- Q.14** A wire of resistance R is cut into n equal parts. These parts are then connected in parallel. The equivalent resistance of combination will be -
 (A) nR (B) R/n
 (C) n/R (D) R/n^2

- Q.15** A piece of wire of resistance 4Ω is bent through 180° at its mid point and the two halves are twisted together, then resistance is -
 (A) 1Ω (B) 2Ω
 (C) 5Ω (D) 8Ω

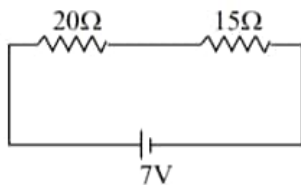
- Q.16** Three resistance each of 8Ω are connected to a triangle. The resistance between any two terminals will be:
 (A) 12Ω (B) 2Ω
 (C) 6Ω (D) $\frac{16}{3}\Omega$

Q.30 A resistance of 12 ohm is connected in parallel with another resistor X. The resultant resistance of the combination is 4.8 ohms. What is the resistance X?

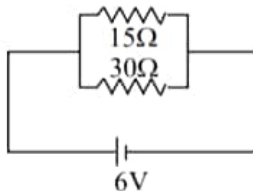
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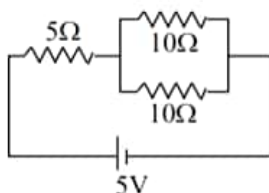
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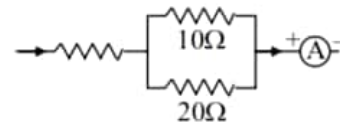
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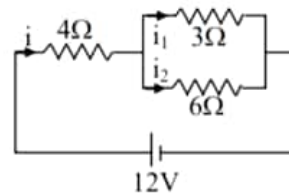
Q.36 Figure shows a part of an electric circuit. The reading of the ammeter is 3.0 A. Find the currents through the 10- Ω and 20- Ω resistors.



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