

**QUESTION BANK**

**Ch Electricity**

**One mark questions**

- Q1 Define Ohm's Law.
- Q2 What is electrical resistivity?
- Q3 Define 1 Ohm resistance.
- Q4 What is the shape of the graph obtained by plotting potential difference applied across the conductor against the current flowing through it.
- Q5 State the relation between the power 'P' consumed by the device, its resistance R and voltage V across it.
- Q6 What is the commercial unit of energy?
- Q7 Which one is having lesser resistance: A 60W bulb or a 40 W bulb?
- Q8 Two resistors of 30 and 60 are connected in parallel in an electric circuit. Compare the current passing through the two resistors.
- Q9 n resistors each of resistance R are connected in parallel in an electric circuit. What is the total effective resistance of the circuit?
- Q10 An electric bulb draws 1.5 A current at 6V. Find the resistance of the filament of the bulb. Q11 If a wire is stretched to double of its original length, then what will be the new resistivity?
- Q12 Name the instrument used to measure the electric potential difference.

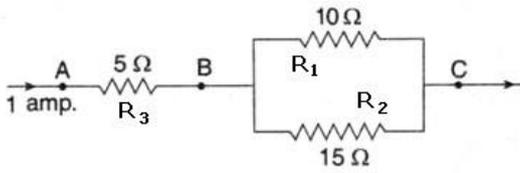
**Two marks questions**

- Q1 Establish the relationship between 1 kWh and SI unit of energy.
- Q2 List two reason why nichrome is used for making heating element of electrical appliances.
- Q3i) Draw a schematic diagram of a circuit consisting of a 24V battery, a 10 ohm resistor, a 5ohm resistor, a 1 ohm resistor, an ammeter and a plug key, all connected in series.
- (ii) Calculate the ammeter reading in this circuit.
- Q4 (i) What is meant by electrical resistance of a conductor ?
- (ii) A wire of length L and resistance R is stretched so that its length is doubled and the area of a cross-section is halved. How will its resistance change ?

- Q5 A current of 2A passes through a circuit for 1 minute. If potential difference between the terminals of the circuit is 3 V ,what is the work done in transferring the charge?
- Q6 How many 40 W bulbs can be safely connected in parallel circuit which is drawing a 4 A current from a 220 V supply?
- Q7 Explain the role of fuse connected in series with any electrical appliance in an electric circuit?
- Q8 Why does the chord of an electric heater not glow while the heating element does?
- Q9 (i) Explain why tungsten is used for making the filaments of electric bulbs.  
(ii) Why Argon and Nitrogen is filled in an electric bulb ?
- Q10 A heating coil has a resistance of 200 ohm. At what rate will heat be produced in it when a current of 2.5 A flows through it ?

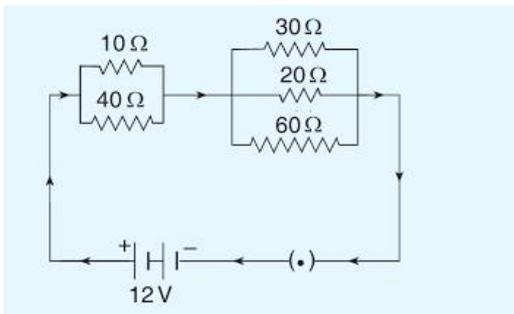
### Three mark Questions

- Q1 An electric heater draws a current of 10A from a 220V supply. What is the cost of using the heater for 5 hrs everyday for 30 days if the cost of 1 unit is Rs 5.20 ?
- Q2 A bulb is rated 200V-100W. What is its resistance ? Five such bulbs burn for 4hrs. What is the electrical energy consumed ?
- Q3 Three incandescent bulbs of 100 W each are connected in series in an electric circuit. In another circuit another set of three bulbs of the same wattage are connected in parallel to the same source.
- (a) Will the bulb in the two circuits glow with the same brightness? Justify your answer.
  - (b) Now let one bulb in both the circuits get fused. Will the rest of the bulbs continue to glow in each circuit? Give reason.
- Q4 State Ohm's law? How can it be verified experimentally? Does it hold good under all conditions? Comment.
- Q5 What is electrical resistivity of a material? What is its unit? What are the factors on which the resistance of conducting wire depends.
- Q6 What is Joule's heating effect? List its two applications in daily life.
- Q7 Three resistors are connected as shown in the diagram. Through the resistor 5 ohm a current of 1A is flowing.



- (i) What is the total resistance ?
- (ii) What is the potential difference across AB and AC ?
- (iii) What is the current through other two resistors ?

Q8 In a circuit diagram given below five resistances of  $10\Omega$ ,  $40\Omega$ ,  $30\Omega$ ,  $20\Omega$  and  $60\Omega$  are connected as shown to a 12V battery.



Calculate :

- (i) Total resistance in the circuit.
- (ii) Total current flowing in the circuit.

Q9 Calculate the resistance of a copper wire 1km long and 0.50mm in diameter if the resistivity of copper is  $1.7 \times 10^{-8}\Omega\text{m}$ .

Q10 Two resistors of resistances  $R$  and  $2R$  are connected in series in an electric circuit. Calculate the ratio of electric power consumed by  $R$  and  $2R$ .

**Five mark questions**

- Q1 (i) Define electric current. What is the S.I unit of electric current.
- (ii) One coulomb of charge flows through any cross-section of a conductor in one second. What is the current flowing through the conductor ?
- (iii) Which instrument is used to measure electric current ? How should it be connected in the circuit ?
- (iv) What is the conventional direction of the flow of electric current ?

Q2(i) The values of potential difference applied across the resistor and the corresponding of current  $I$  flowing in the resistor are given below :

Potential Difference V in volts	2.5	5.0	10.0	15.0	20.0	25.0
Current I in amps	0.1	0.2	0.4	0.6	0.8	1.0

Plot a graph between V and I and calculate the resistance of the resistor.

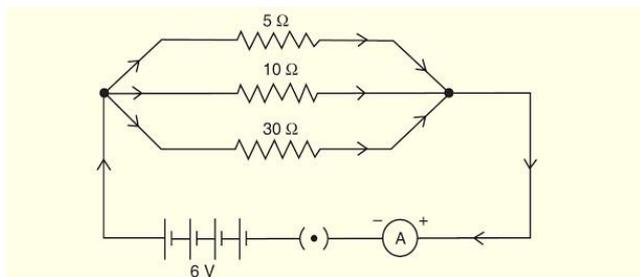
- (ii) Name the law which is illustrated by the above V-I graph.
- (iii) The potential difference between the terminals of an electric iron is 240V and the current is 5A  
What is the resistance of the electric iron ?

Q3 (i) Define resistivity. Write an expression for the resistivity of the substance.

- (ii) State the S.I unit of resistivity.
- (iii) Name two factors on which the resistivity of a substance depends.
- (iv) The resistance of a metal wire of length 1m is  $26 \Omega$  at  $20^{\circ}\text{C}$ . If the diameter of the wire of 0.3mm what will be the resistivity of the metal at that temperature ?

Q4 (i) Derive the formula for the resultant resistance of two resistors connected in parallel.

(ii) For the given circuit diagram



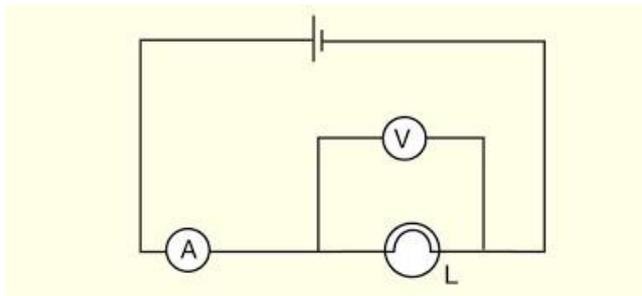
Find

- (a) The values of current through each resistor.
- (b) The total current in the circuit.
- (c) The total effective resistance of the circuit.

Q5i) What is meant by electric power ? Write the formula of electric power in terms of potential difference and electric current.

(ii) The diagram below shows a circuit containing a lamp L, a voltmeter and an ammeter. The voltmeter reading is 3V and ammeter reading is 0.5A.

iii) What is the resistance of the lamp ? Also find the power of the lamp.



Q6 (i) Derive the expression for the heat produced due to current  $I$  flowing for time interval  $t$  through resistor  $R$  having a potential difference  $V$  across its ends.

(ii) How much heat will an instrument of  $12W$  produce in 1 minute if it is connected to a battery of  $12V$ .

(iii) Give two applications of the heating effect of current.

Q7 When a current of  $4A$  passes through a certain resistor for 10minutes  $2.88 \times 10^4 J$  of heat is produced. Calculate

(i) The power of the resistor.

(ii) The voltage across the resistor.

Q8 For a heater rated at  $4kW$  and  $220V$ . Calculate

(i) The current.

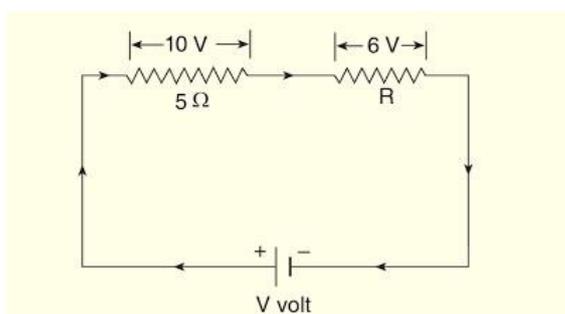
(ii) The resistance of the heater.

(iii) The energy consumed in 2hrs.

(iv) The cost if  $1kWh$  is priced at Rs 4.60.

Q9 (i) With the help of a circuit diagram deduce the equivalent resistance of two resistances connected in series.

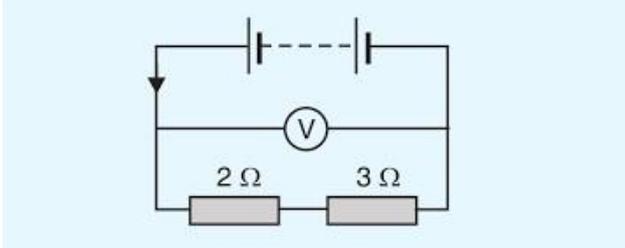
ii) With the help of the given diagram, find the following



(a) What is the current through  $5\Omega$  resistance ?

- (b) What is the current through R ?
- (c) What is the value of R ?
- (d) What is the value of V ?

Q10 In the given circuit the voltmeter reads 10V.



- (i) What is the combined resistance ?
- (ii) What current flows through the circuit ?
- (iii) What is the potential difference across 2ohm resistor ?
- (iv) What is the potential difference across 3ohm resistor ?