

Practice set 3

Answers

- The physical quantity which is expressed by the unit joule per coulomb is
a) **electric potential**, b) electric current, c) electrical resistance, d) electric charge
- The potential at a point is 20 volt. The work done in bringing a charge of 2 coulomb from infinity to this point will be
a) 20 J **b) 40 J** c) 5 J d) 10 J
- An ammeter is used to measure
a) Potential difference **b) electric current** c) electric resistance d) electric power
- The current in a wire depends
a) Only on the resistance of the wire
b) Only on the potential difference applied
c) On both of them
d) On none of them
- Number of electrons in 1 m C of charge is
a) 6.25×10^{17}
b) 6.25×10^{15}
c) 1.6×10^{16}
d) 1.8×10^{-16}
- A current of 1 A flows in a wire for 5 minutes. Find the amount of electric charge that flows through the wire.

Ans: $q = It = 1 \times 5 \times 60 = 300$ Coulomb.

- Calculate the number of electrons present in 1 coulomb of charge.

Ans: $q = ne$, so $n = q/e = 1/1.6 \times 10^{-19} = 6.25 \times 10^{18}$

- Name the instruments used to measure electric current and potential difference respectively. Which of these is connected in series and which is connected in parallel in a circuit?

Ans: For measurement of electric current, an ammeter is used.

For measurement of potential difference, a voltmeter is used.

An ammeter is connected in series and a voltmeter is connected in parallel to the circuit.

9. A particle with a charge of 2 coulomb is taken from a point A at a potential of 50 volt to another point B at a potential of 120 volt. Calculate the work done.

$$\text{Ans: } W = \Delta Vq = (120 - 50) 2 = 140 \text{ J}$$

10. The current through a conductor is 10 ampere. Explain this statement in terms of the charge flowing through the wire.

Ans: The above statement means that through the wire 10 coulomb of electric charge flows in 1 s.

11. When a 24 V battery is connected to a resistor, the current in it is 0.4 A. What is the resistance of the resistor? What should be the current through it if it is connected to a battery of 6 volt?

$$\text{Ans. } V = IR, R = V/I = 24 / 0.4 = 60 \text{ ohm.}$$

$$I = V/R = 6 / 60 = 0.1 \text{ A}$$

12. State ohm's law. Derive its mathematical form. From ohm's law define one ohm resistance.