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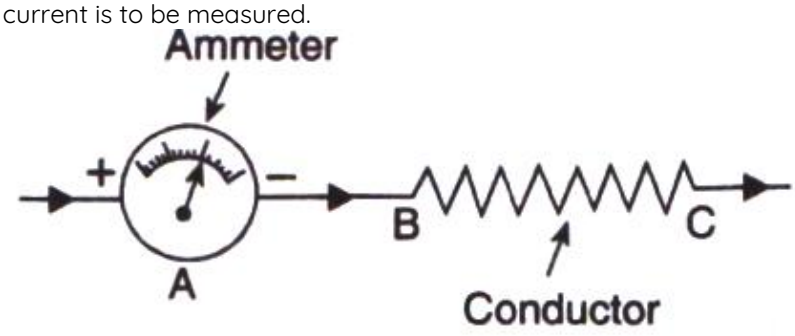
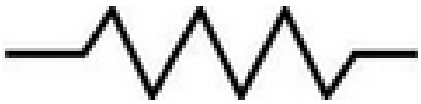
Q1. Ampere
Q2. Electric Current.
Q3. Electrons.
Q4. Electrons.
Q5. (a) Conventional current flows from positive terminal of a battery to the negative terminal, through the outer circuit.
(b) Electrons flow from negative terminal to positive terminal of the battery (opposite to the direction of conventional current).
Q6. 1A = 1C/s
Q7. Ampere.
Q8. (a) 1 amp = 10^3 milli amp.
(b) 1 amp = 10^6 micro amp.
Q9. Ammeter is connected in series.
Q10. Ammeter is connected in series in a circuit whereas voltmeter is connected in parallel.
Q11. (i) Variable resistance.
(ii) A closed plug key.
Q12. Given, Q = 20 C, t=1s
I=?
We know that:
I=Q/t.
I=20/1=20A.
Q13. Given, I=4amp, C, t=10s Q=?
We know that:
I=Q/t.
Q=4*10=40C.
Q14. Given, Q = 20 C, t=1s
I=?
We know that:
I=Q/t.
Thus I=20/40=0.5A.
Q15. (a) electrons; closed
(b) amperes; ammeter; series.
Q16.
(a) Cell or battery helps to maintain potential difference across a conductor.
(b) Given: p.d. = 10 V, I = 2amp, t = 1 min = 60s.
We know that:
I=Q/t.
Thus, Q=Ixt.
Q=2x60.
Q=120 C.
Work done = p.d. x charge moved
Work done = 120x10J
Work done = 1200J.
Q17. (a) An electric currrent is a flow of electric charges (electrons) through a conductor.
Potential difference between the ends of the wire makes electric current to flow in the wire.
(b) When 1 coulomb of charge flows through any cross-section of a conductor in 1 second, the electric current flowing through it is said to be 1 ampere.
Q18. Ammeter is a device used for the measurement of electric

current. It is always connected in series with the circuit in which the current is to be measured.

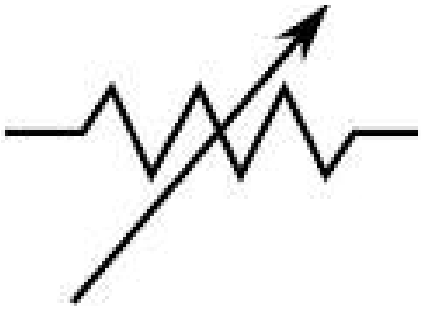


Q19. (a). Work done = Potential difference x charge moved.
(b). I=0.36A, t=15min =900seconds.
Q=Ixt
=0.36x900
=324C.
Q20. (a) The resistance of an ammeter should be very small so that it may not change the value of the current flowing in the circuit.
(b) The resistance of a voltmeter should be very large so that it takes a negligible current from the current.
Q21.

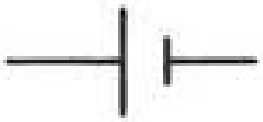
(a) Fixed resistance



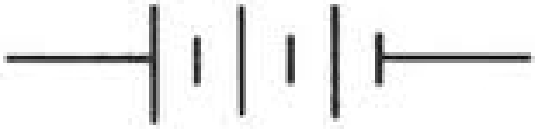
(b) Variable resistance



(c) Cell



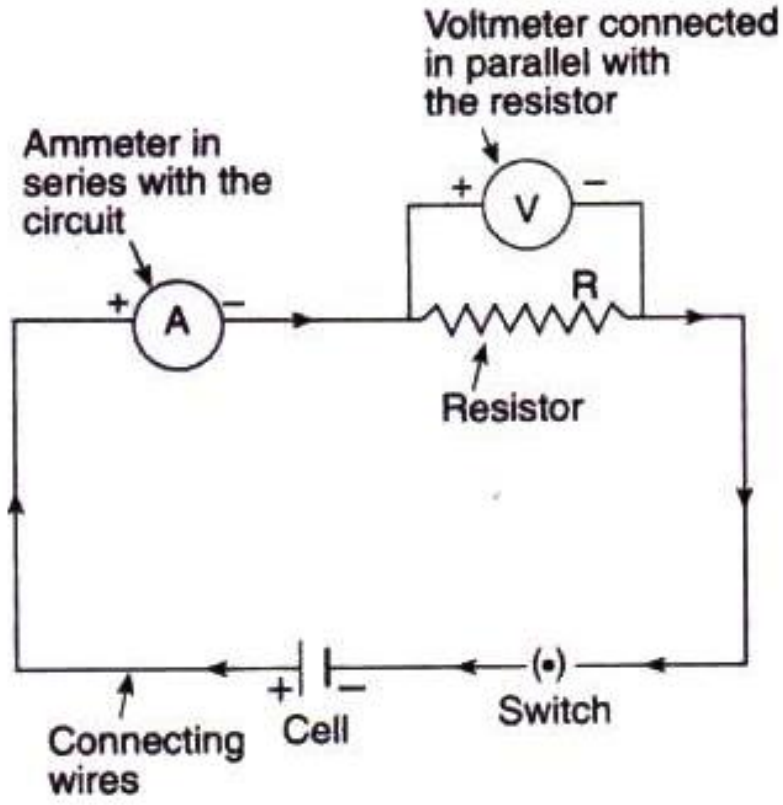
(d) Battery of three cells



(e) Open switch

(f) Closed switch

Q22.
A diagram which indicates how different components in a circuit have been connected by using the electrical symbols for the components is called a circuit diagram.



A voltmeter has a large resistance.

Q23.

We know that

$$I = \frac{Q}{t}$$

$$\Rightarrow \quad 1\ A = \frac{Q}{1\ s}$$

$$\Rightarrow \quad Q = 1\ C$$

Now,

When charge is 1.6×10^{-19} coulombs, number of electrons = 1

When charge is 1 coulomb, number of electrons =

$$\frac{1}{1.6 \times 10^{-19}} = 0.625 \times 10^{19} = 6.25 \times 10^{18}$$

Q24.

p.d. = 12V

(a) $\text{p.d.} = \frac{\text{Work done}}{\text{Charge moved}}$

Work done=p.d. x Charge moved

= 12 x 1 = 12J

Amount of electrical energy changed into heat and light=12J

(b) Work done=p.d. x Charge moved

= 12 x 5 = 60J

Amount of electrical energy changed into heat and light=60J

(c) $I = \frac{Q}{t}$

Q = I x t

= 2 x 10 = 20C

Work done=p.d. x Charge moved

= 12 x 20 = 240J

Amount of electrical energy changed into heat and light=240J

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Q25.

$t = 10\,s,\ Q = 25\,C$, Energy delivered = Work done = 200 J

(a) $\text{p.d.} = \dfrac{\text{Work done}}{\text{Charge moved}} = \dfrac{200}{25} = 8\,V$

(b) $I = \dfrac{Q}{t} = \dfrac{25}{10} = 2.5\,A$

Q26. (a) Electric current is the flow of electric charges (electrons) in a conductor such as a metal wire. SI unit of electric current is ampere.
(b) 1 ampere.
(c) An ammeter is used to measure electric current. It should be connected in series with the circuit.
(d) Conventional direction of flow of electric current is from positive terminal of a battery to the negative terminal, through the outer circuit. The direction of flow of electrons is opposite to the direction of conventional current, i.e. from negative terminal to positive terminal.

(e) $Q = 10\,C,\quad t = 0.01\,s$

$$I = \frac{Q}{t} = \frac{10}{0.01} = 1000\,A$$

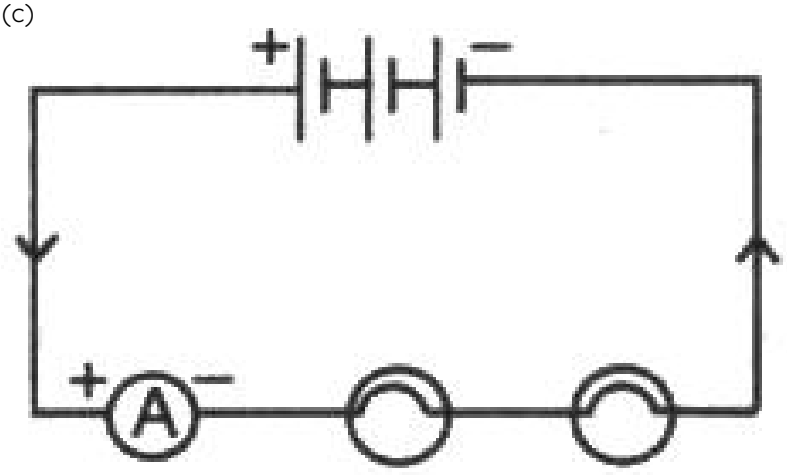
$$\text{p.d.} = \frac{W}{Q}$$

$$W = \text{p.d.} \times Q$$

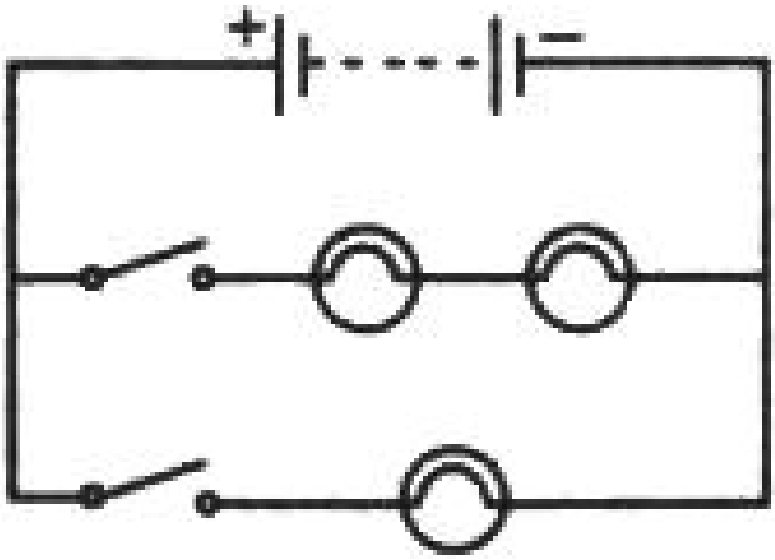
$$= 10 \times 10^6 \times 10 = 100 \times 10^6 = 100\,MJ$$

Energy = work done = 100 MJ

Q32. (a) Lamps are in series.
(b) Student has connected ammeter in parallel with lamps. It should be connected in series.
(c)



Q33.



Q34.

p.d. = 230 V, I = 8 A

(a) $I = \frac{Q}{t}$

$8 = \frac{Q}{1}$

$Q = 8 \times 1 = 8\,C$

So, 8C of charge flows around the circuit each second.

(b) Energy transferred = Work done

$p.d. = \frac{\text{Work done}}{\text{Charge moved}}$

$230 = \frac{\text{Work done}}{8}$

Work done = $230 \times 8 = 1840\,J$

Energy transferred = 1840 J

Q35.

I = 5 A

t = 1 s

$I = \frac{Q}{t}$

$Q = I \times t = 5 \times 1 = 5\,C$

No. of electrons comprising 1.6×10^{-19} C = 1

No. of electrons comprising $5C = \frac{5}{1.6 \times 10^{-19}} = 31.25 \times 10^{18}$

********** END **********