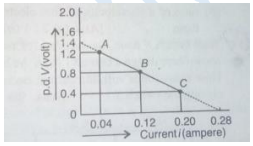
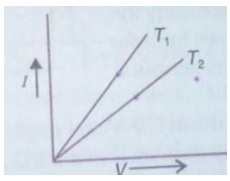
Current complete assignment class12th
(Physics by Nayan jha)

1. How does the drift velocity of electrons in a metallic conductor very with increase in temperature ?
2.The metallic conductor is at a temperature θ_1 .The temperature of the metallic conductor is increased to θ_2. How will the product of its resistivity and conductivity change ?
3. A cell of e.m.f. 2 V and internal resistance 0.1 Ω is connected to a 3.9 Ω external resistance . What will be the p.d. across the terminals of the cell ?
4.Nichrome and copper wires of the same length and same radius are connected in series .Current I is passed through them .Why does the nichrome wire get heated first ?
5. Sate the condition in witch terminal voltage across a secondary cell is equal to its e.m.f.
6. Two bulbs whose resistances are in the ratio of 1 ; 2, are connected in parallel to a source of constant voltage . What will be the ratio of power dissipation in these?
7. A toaster produces more heat than a light bulb when connected in parallel to the 220 V mains. Which of the two has greater resistance ?
8. Why is a voltmeter always connected in parallel with a circuit element across which voltage is to be measured ?
9. If the length of a wire conductor is doubled by stretching it, keeping the potential difference across is constant, by what factor does the drift speed of electrons change ?
10. Define conductance of a material. Give its S.I. units
11. Define conductivity. why conductivity of a semiconductor increase with temperature?
12. How does conductivity of a semiconductor increase with temperature?
13. A low voltage supply from which one needs high currents must have very low internal resistance Why ?
14. Write the mathematical relation between mobility and drift velocity of charge carriers in a conductor. Name the mobile charge carriers responsible for conduction of electric current in (1) an electrolyte ,and (2) an ionised gas.
15.Plot a graph showing the variation of current verses voltage for the material GaAs . and in the graph identify the reason for (a) negative resistance (b) where Ohm's law is obeyed.

16. Draw V-1 graph for Ohmic and non-ohmic materials .Give one example for each.
17. Define the 'temperature coefficient of resistivity' .Draw a graph showing the variation of resistivity with temperature for copper.
18. Two identical cells, of emf 1.5 V each are joined in parallel providing supply to an external circuit consisting of two resistors of 13 Ω each joined in parallel. A very high resistance voltmeter reads the terminal voltage of the cells to be 1.4 V. find the internal resistance of each cell.
19. A cell, of emf 4 V and internal resistance 0.5 Ω, is connected across a load of resistance ;(1)7.5 Ω is (2)11.5 Ω calculate (1) the ratio of the differences in the emf of the cell and the potential drop across the currents in the two cases.
20.For recharging , n cells, each of e.m.f E and internal resistance 'r' are connected in series to a resister 'R' and a d.c. source of e.m.f V. Deduce the expressions for (1) charging current in the circuit , and (2) terminal voltage across the cells, during charging .
21. Potential difference across terminals of a cell were measured (in volts) against different currents (in ampere) flowing through the cell. A graph was drawn which was a straight line ABC . Using the data given in the graph determine ,(1) the emf and (2) the internal resistance of the cell.



22. V-I graph for a metallic wire at two different temperatures T_1 and T_2 is as shown in the following figure .Which of the two temperatures is higher and why ?



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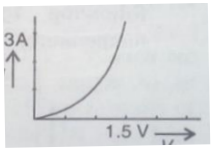
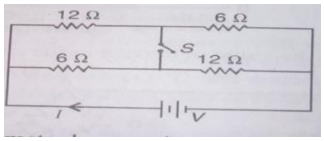
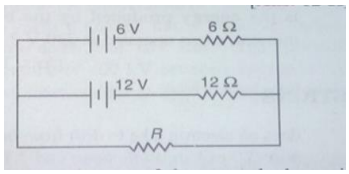
23. A cell of e.m.f. 1.5 V and internal resistance 0.5 Ω is connected to a (non -linear) conductor whose V-1 graph is shown in figure .Obtain graphically the current drawn from the cell and its terminal voltage.



24. With switch S open ,the network of resistors shown here drawn a current I from the battery. How many times will this current become on closing the switch S?



25 (a).E.M.F. of a cell is 1.5 V And its internal resistance is 1 Ω For what current drawn from the cell will its terminal potential difference be half of its e.m.f. ? (b) In the circuit diagram shown here what should be the value of R so that there is no current in the branch containing 6 V battery ?

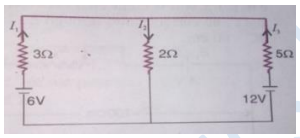


26. Two identical cells of e.m.f. 1.5 V each joined in parallel provide supply to an external circuit consisting of two resistors of 17 Ω each joined in parallel. A very high resistance voltmeter reads the terminal voltage of the cells to be 1.4 V. What is the internal resistance of each cell?

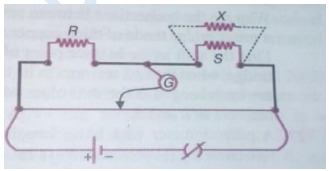
27. A potential difference of V volts is applied to a conductor of length L, and diameter D. How will the drift velocity of electrons and the resistance of the conductor change when ;

(i) V is doubled ,(ii) L is halved and (iii) D is halved .where ,in each case ,the other two factors remain same .Give reason in each case.

28. In the given network find the values of the currents, I_1 , I_2 ,and I_3.



29.When two known resistance , R and S , are connected in the left and right gaps of a meter bridge ,the balance point is found at a distance l_1 from the 'zero end' of the meter bride wire .An unknown resistance X is now connected in parallel to the resistance S and the balance point is found at a distance l_2 from the zero end of the meter bridge wire .obtained the formula for X in terms of l_1, l_2 and S.



34. Find the value of an unknown resistance X, in the following circuit , if no current flows through the section AO .Also calculate the current drawn by the circuit from the battery of e.m.f 6 V and negligible internal resistance.

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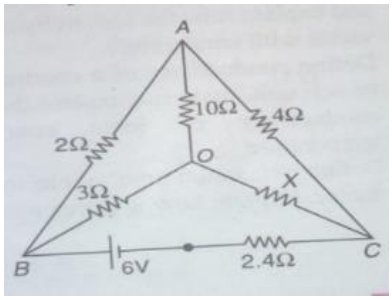


Practice for 3 and 5 markers questions-

1. (a) Why do the free electrons in a metal wire , flowing by themselves not cause the any current flow in the wires?

(b) Define drift velocity and obtain an expression for the current flowing in a wire , in terms of free electrons of the wire.

(c) Use the above expression to show that the resistivity of the material of the wire is inversely proportional to the relaxation time for the free electrons in the metal.

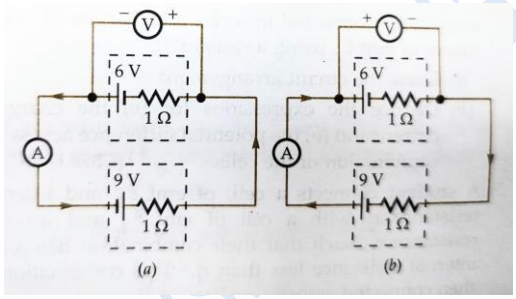
(d)Why alloys like constantan and manganin are used for making standards resistor.

2.A cell of emf E and internal resistance 'r' is connected across a variable resistor R , establish the relation between emf,terminal potential and internal reasistance, also plot the shape of graph showing the variation of (a) terminal voltage verses R (b) emf E verses R and (c) potential verses current.

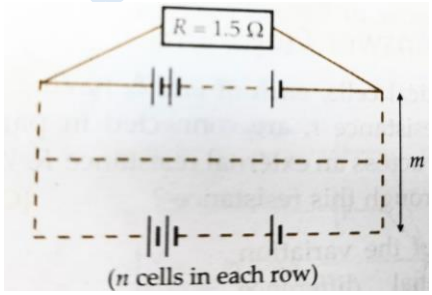
3. If two cells of emf E_1 and E_2 internal resistance r_1 and r_2 are (a) connected in series and (b) connected in parallel then find the expression for equivalent resistance and equivalent emf in both the cases .

Also solve the following questions -

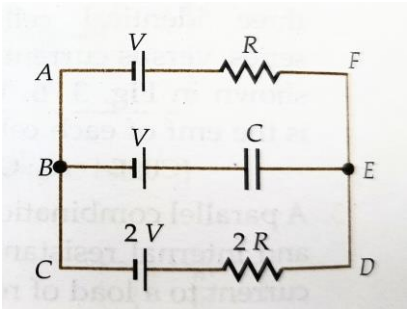
(i) Find the reading of voltmeter and ammeter in the given diagram=-



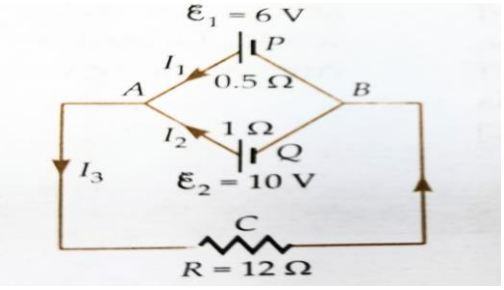
(ii) 12 cells each of emf 1.5 volt and internal resistance of 0.5 Ohm are arranged in 'm' row and 'n' cells in each row connected in series . Calculate the value of m and n for which the combination would send maximum current through an external resistance 1.5 Ohm.



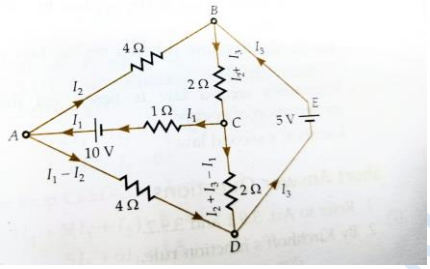
(III) As shown in the fig. obtain the expression for (a) the potential drop (b) the charge and (c) the energy stored in the capacitor C .



(iv) State Kirchhoff's law , using kirchhoff's law find the balancing condition of wheat-stone-bridge, also find the value of $i_1$and i_2 in the given circuit diagram.



(v) Using Kirchhoff's rule write the all possible equations of the given diagram also find the current in each arm.



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