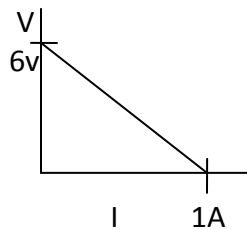
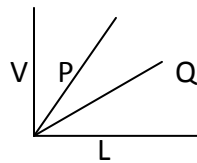


## 3. CURRENT ELECTRICITY (PHYSICS XII)

1. In an experiment on meter bridge, if the balancing length AC is  $x$ , what would be its value when the radius of the meter bridge wire AB is doubled?
2. Two conducting wires X and Y of same diameter but different materials are joined in series across a battery. If the number density of electrons in X is twice that in Y, find the ratio of drift velocity of electrons in the two wires.
3. The plot of variation of potential difference across a combination of three identical cells in series, versus current is as shown here. What is the emf of each cell?



4. The variation of potential difference  $V$  with length  $L$  in case of two potentiometers P and Q is as shown. Which one of these two will you prefer for comparing emfs of two primary cells?



5. Show graphically, the variation of resistivity with temperature for semiconductor, carbon and conductor
6. A potential difference  $V$  is applied to a conductor of length  $L$ , diameter  $D$ . How are the electric field  $E$ , drift velocity  $v$  and resistance  $R$  are affected when (i)  $V$  is doubled, (ii)  $L$  is doubled, (iii)  $D$  is doubled.
7. Two metallic wire of same material have the same length but cross sectional area in the ratio 1:2. They are connected (i) in series and (ii) in parallel. Compare the drift velocities of electrons in the two wires in both cases.
8. First a set of  $n$  equal resistors of resistance  $R$  each are connected in series to a battery of emf  $E$  and internal resistance  $R$ . A current  $I$  is observed to flow. Then the  $n$  resistors are connected in parallel to the same battery. It is observed that the current is increased 10 times. What is  $n$ ?
9. Two cells each of emf  $E$  and internal resistance  $r_1$  and  $r_2$  are connected in series to an external resistance  $R$ . Find the value of  $R$  such that potential difference at the first cell is zero.
10. Two cells of emf  $E_1$  and  $E_2$  ( $E_1 > E_2$ ) are connected as shown. When a potentiometer is connected between A and B, the balancing length of potentiometer wire is 30 cm. On connecting the same potentiometer between A and C, the balancing length is 100cm. Calculate the ratio of  $E_1$  and  $E_2$ .

