## **366.**

## Problem31.25 (RHK)

In the figure two identical capacitors of capacitance C in a circuit with two (ideal) diodes D have been shown. A 100-V battery is connected to the input terminals, (a) first with terminal a positive and (b) later with terminal b positive. In each case, we have to find the potential difference across the output terminals. (An ideal diode has the property that positive charge flows through it only in the direction of the arrow and negative charge flows through it only in the opposite direction)



## **Solution:**

We will consider the circuit shown in the figure in the when a 100-V battery is connected in two situations described below. (a) Terminal *a* is connected to the +ve end of the battery. In this situation charge will flow through the diode in the top branch and charge both the capacitors. The potential difference across *a* and *b* will be 100 V.

As in this situation the two capacitors are connected in series, the potential difference across each will be 50 V and therefore the potential difference across the output terminals will be 50 V.

(b) Terminal b is connected to the +ve end of the battery. In this case charge flows through the capacitor-1 only. The potential difference across the capacitor-1 will be 100 V. As both plates of the capacitor-2 will be at 100 V, the potential difference across the output terminals will be zero.