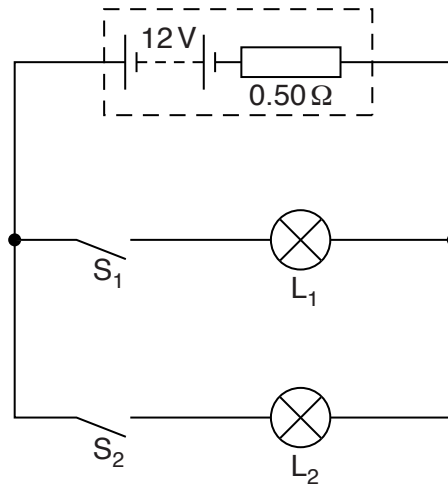


- 6 A 12V battery with internal resistance  $0.50\Omega$  is connected to two identical filament lamps  $L_1$  and  $L_2$  as shown in Fig. 6.1.



**Fig. 6.1**

The lamps are connected to the battery via switches  $S_1$  and  $S_2$ . The power rating of each lamp is 48W for a potential difference of 12V.

- (a)  $S_1$  is closed and  $S_2$  open.

State and explain whether the power transformed in  $L_1$  is 48W.

.....  
 .....  
 .....[2]

- (b)  $S_2$  is now also closed.

- (i) State and explain the effect on the current in  $L_1$ .

.....  
 .....  
 .....[1]

- (ii) State and explain the effect on the resistance of  $L_1$ .

.....  
 .....  
 .....[1]