

## **A level Physics B**

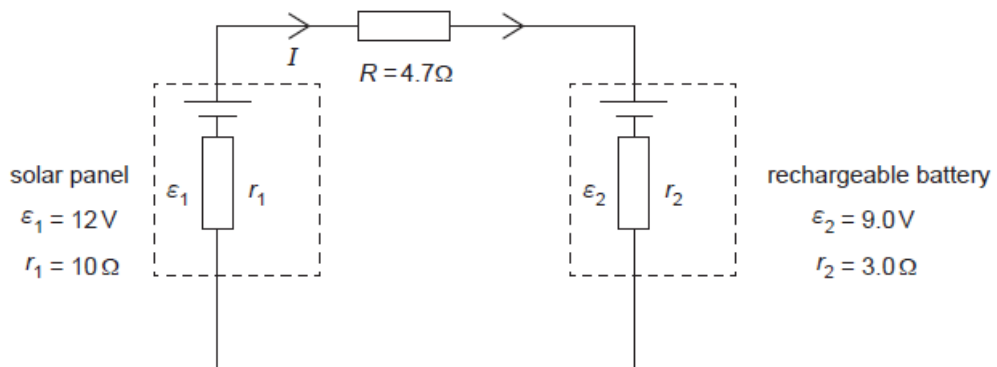
**H557/01** Fundamentals of physics

### **Question Set 19**

1.

A solar panel is charging a rechargeable battery, with a resistor  $R$  in series.

The values of the internal resistances  $r$ , the external resistance  $R$  and the e.m.f.s  $\mathcal{E}$  at the start of the charging process are shown in **Fig. 1**.



**Fig. 1**

(a) Show that the initial current charging the rechargeable battery  $I$  is less than 0.2A.

[2]

(b) When fully charged, the rechargeable battery has enough charge to deliver an average current of 500 mA for an hour before it is fully discharged.

Estimate the time needed to recharge the battery at the mean charging current of 0.12 A.

time = .....hours [2]

**Total Marks for Question Set: 4**

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