

- 5 A capacitor  $C$  is charged using a supply of e.m.f.  $8.0\text{V}$ . It is then discharged through a resistor  $R$ . The circuit is shown in Fig. 5.1.

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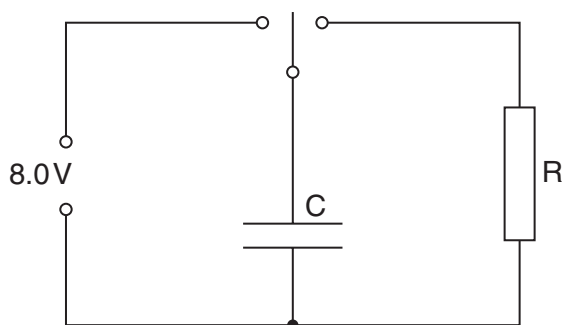


Fig. 5.1

The variation with time  $t$  of the potential difference  $V$  across the resistor  $R$  during the discharge of the capacitor is shown in Fig. 5.2.

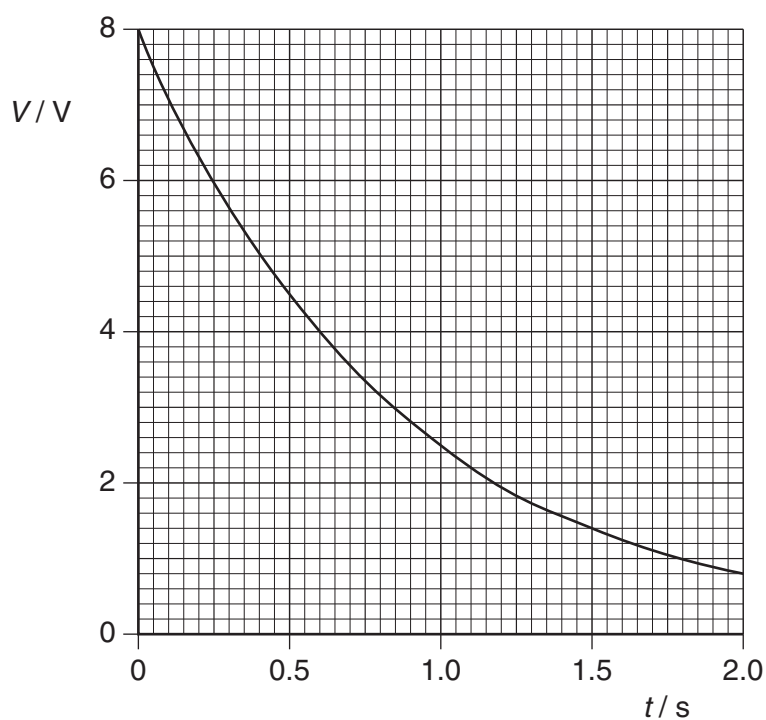


Fig. 5.2

- (a) During the first  $1.0\text{s}$  of the discharge of the capacitor,  $0.13\text{J}$  of energy is transferred to the resistor  $R$ .  
Show that the capacitance of the capacitor  $C$  is  $4500\text{ }\mu\text{F}$ .

- (b) Some capacitors, each of capacitance  $4500\ \mu\text{F}$  with a maximum working voltage of  $6\text{V}$ , are available.

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Draw an arrangement of these capacitors that could provide a total capacitance of  $4500\ \mu\text{F}$  for use in the circuit of Fig. 5.1.

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