6 **(a)** Define the *capacitance* of a parallel-plate capacitor.

.....

.....

..... [2]

(b) A student has three capacitors. Two of the capacitors have a capacitance of 4.0 μF and one has a capacitance of 8.0 μF.

Draw labelled circuit diagrams, one in each case, to show how the three capacitors may be connected to give a total capacitance of:

(i) 1.6 μF

[1]

(ii) 10 μF.

[1]

(c) A capacitor C of capacitance 47 μF is connected across the output terminals of a bridge rectifier, as shown in Fig. 6.1.

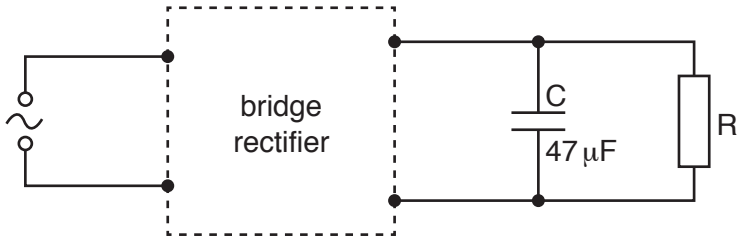

Fig. 6.1

The variation with time *t* of the potential difference *V* across the resistor R is shown in Fig. 6.2.

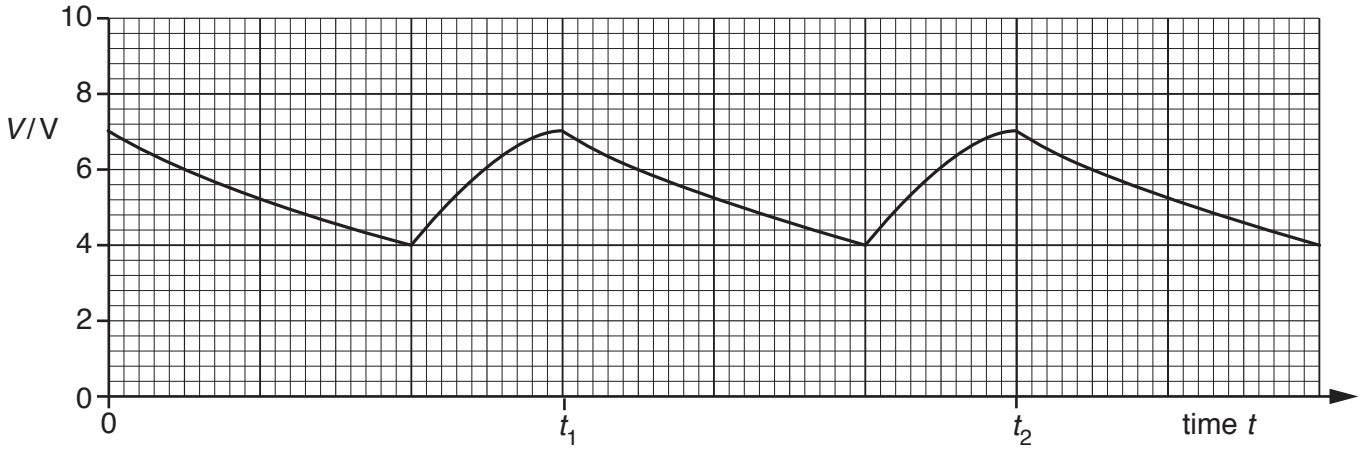

Fig. 6.2

Use data from Fig. 6.2 to determine the energy transfer from the capacitor C to the resistor R between time t_1 and time t_2.

energy = ... J [3]

[Total: 7]