6 **(a)** **(i)** State what is meant by rectification of an alternating voltage.

.....

..... [1]

(ii) State the difference between half-wave rectification and full-wave rectification.

.....

.....

..... [2]

(b) **(i)** Complete Fig. 6.1 to show a circuit that produces half-wave rectification of an alternating input voltage V_{IN} to produce output voltage V_{OUT} across the resistor R.

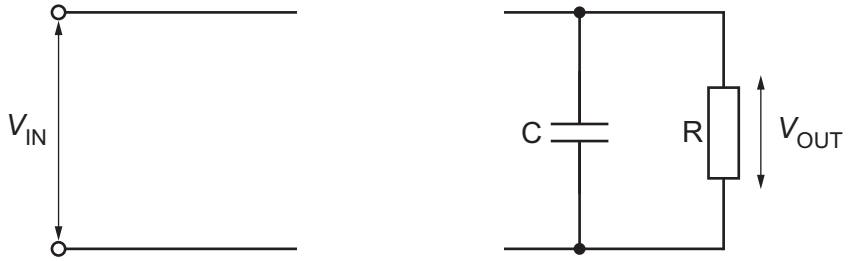

Fig. 6.1

[2]

(ii) State the purpose of the capacitor C in the circuit of Fig. 6.1.

.....

..... [1]

(c) The input voltage V_{IN} in Fig. 6.1 is a square wave. Fig. 6.2 shows the variation of V_{IN} with time t.

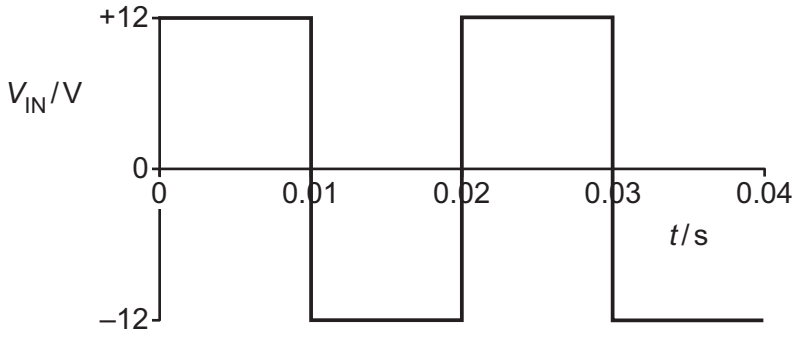

Fig. 6.2

Fig. 6.3 shows the variation of V_{OUT} with t.

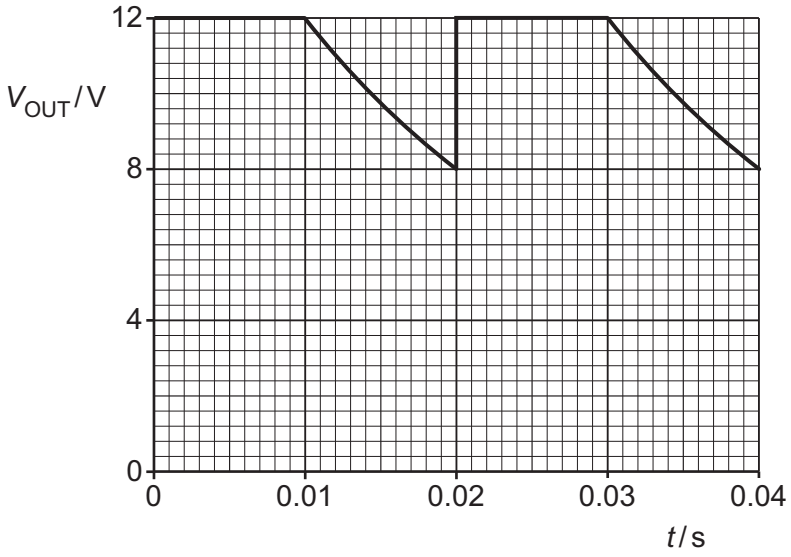

Fig. 6.3

The maximum energy stored in the capacitor is 0.041 J.

(i) Show that the capacitance of C is 570 μF.

[2]

(ii) Determine the resistance of R.

resistance = ... Ω [3]

[Total: 11]