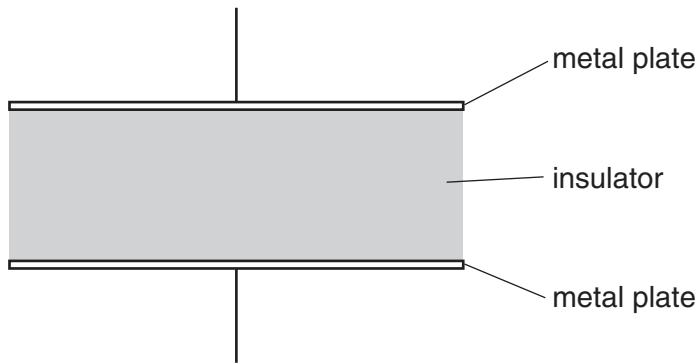
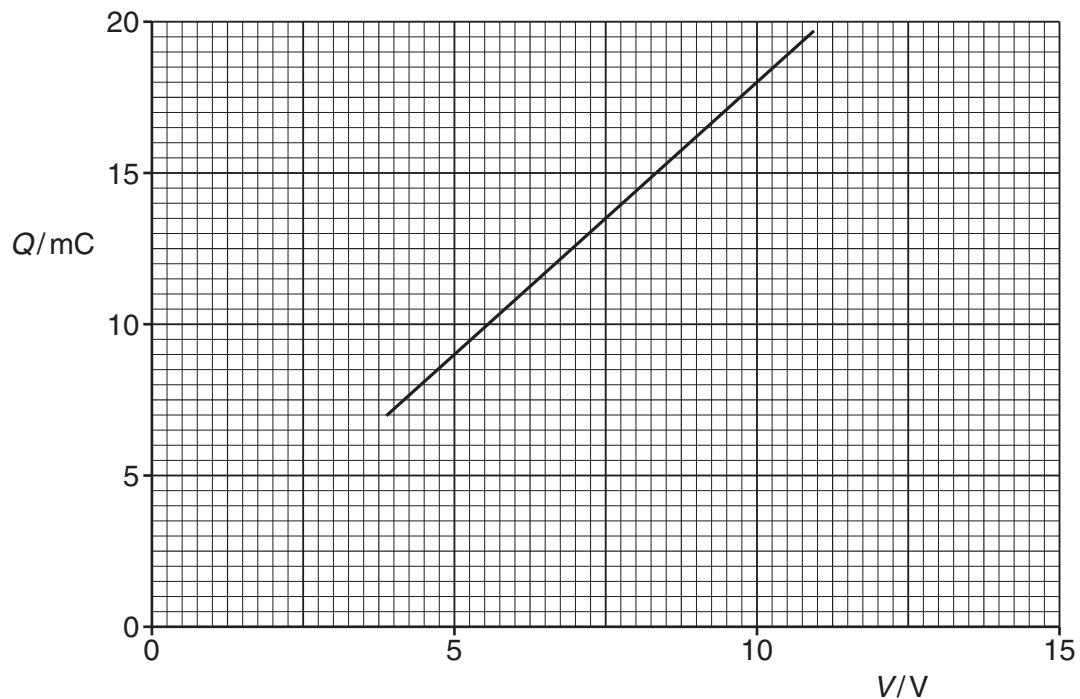


- 3 A capacitor consists of two metal plates separated by an insulator, as shown in Fig. 3.1.



**Fig. 3.1**

The potential difference between the plates is  $V$ . The variation with  $V$  of the magnitude of the charge  $Q$  on one plate is shown in Fig. 3.2.



**Fig. 3.2**

- (a) Explain why the capacitor stores energy but not charge.

.....  
.....  
.....  
.....

[3]

(b) Use Fig. 3.2 to determine

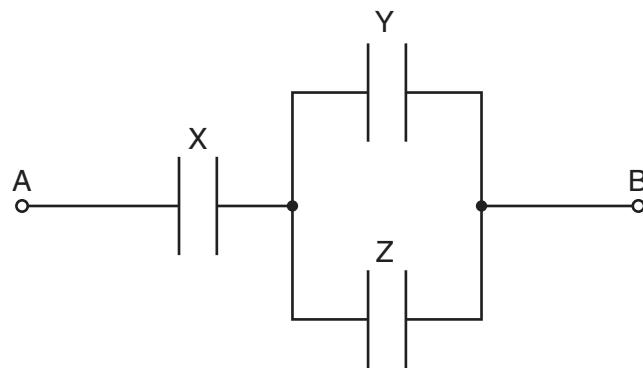
(i) the capacitance of the capacitor,

$$\text{capacitance} = \dots \mu\text{F} [2]$$

(ii) the loss in energy stored in the capacitor when the potential difference  $V$  is reduced from 10.0V to 7.5V.

$$\text{energy} = \dots \text{mJ} [2]$$

- (c) Three capacitors X, Y and Z, each of capacitance  $10\ \mu\text{F}$ , are connected as shown in Fig. 3.3.



**Fig. 3.3**

Initially, the capacitors are uncharged.

A potential difference of 12V is applied between points A and B.

Determine the magnitude of the charge on one plate of capacitor X.

charge = .....  $\mu\text{C}$  [3]