

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

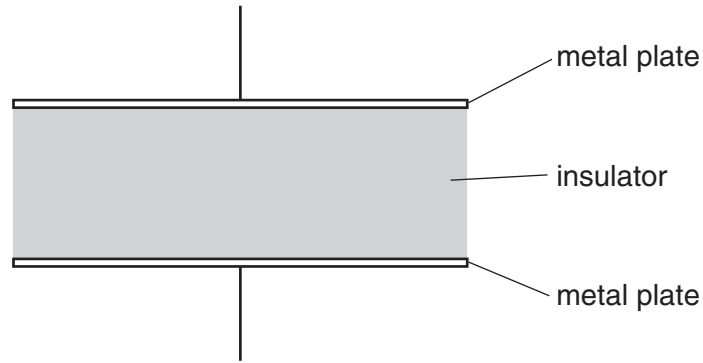


Fig. 3.1

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.

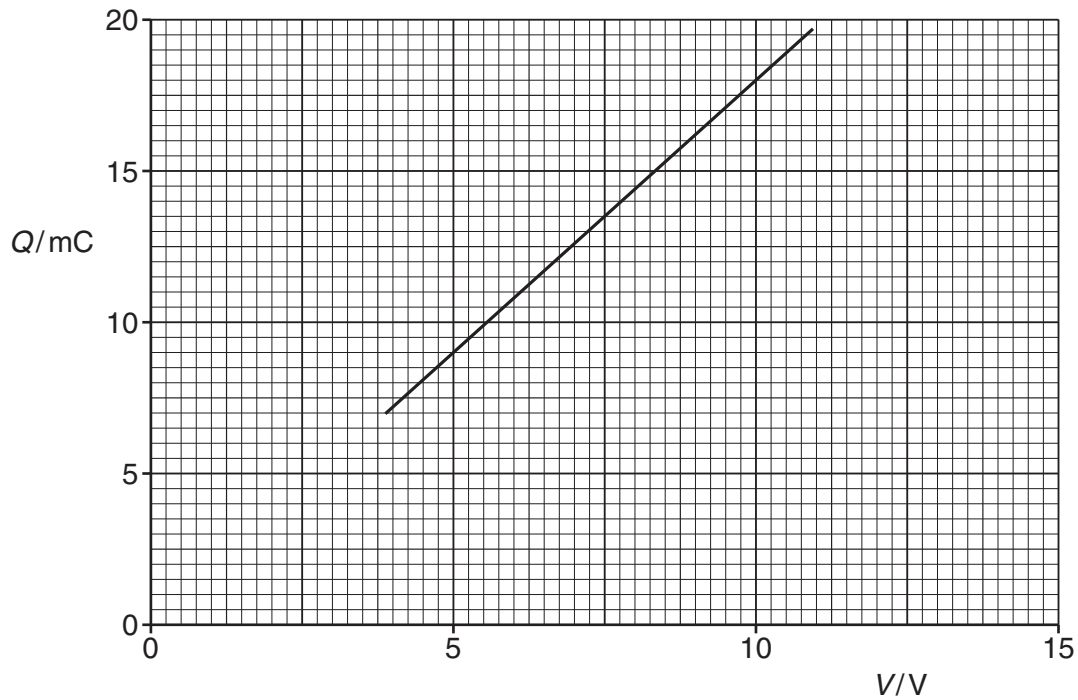


Fig. 3.2

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

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..... [3]

(b) Use Fig. 3.2 to determine

(i) the capacitance of the capacitor,

capacitance = μF [2]

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

energy = mJ [2]

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

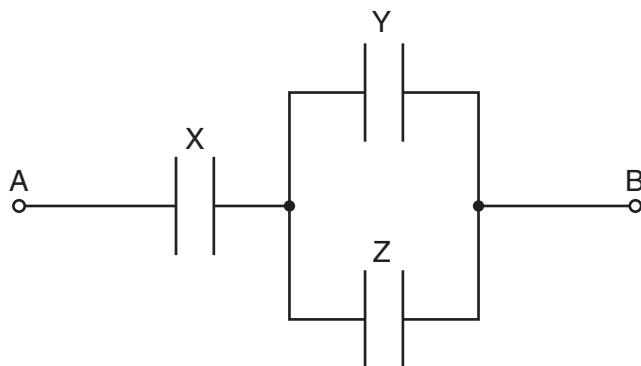


Fig. 3.3

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 = μC [3]