Unit 3 – Electricity
Section 4 – Capacitors

2009 **11.** A 25·0 μF capacitor is charged until the potential difference across it is 500 V.

The charge stored in the capacitor is

A $5{\cdot}00 \times 10^{-8}$ C

B $2{\cdot}00 \times 10^{-5}$ C

C $1{\cdot}25 \times 10^{-2}$ C

D $1{\cdot}25 \times 10^{4}$ C

E $2{\cdot}00 \times 10^{7}$ C.

2010 **11.** A student makes the following statements about capacitors.

I Capacitors block a.c. signals.

II Capacitors store energy.

III Capacitors store charge.

Which of these statements is/are true?

A I only

B I and II only

C I and III only

D II and III only

E I, II and III

2011 **13.** In an experiment to find the capacitance of a capacitor, a student makes the following measurements.

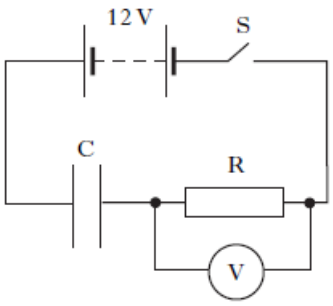
potential difference across capacitor $= (10{\cdot}0 \pm 0{\cdot}1)$ V

charge stored by capacitor $= (500 \pm 25)\,\mu$C

Which row in the table gives the capacitance of the capacitor and the percentage uncertainty in the capacitance?

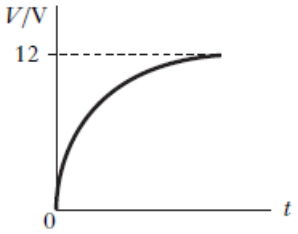
	Capacitance/μF	*Percentage uncertainty*
A	0·02	1
B	0·02	5
C	50	1
D	50	5
E	5000	6

2010 **12.** A circuit is set up as shown.

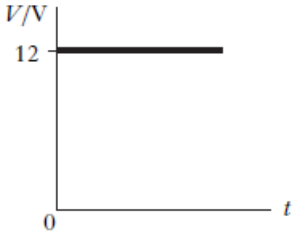


The capacitor is initially uncharged. Switch S is now closed. Which graph shows how the potential difference, V, across R, varies with time, t?

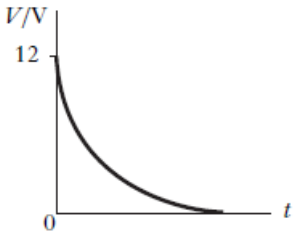
A



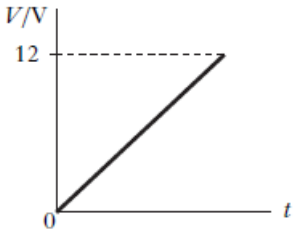
B



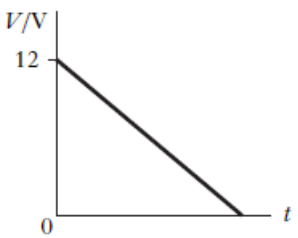
C



D



E



2012 **11.** A student carries out an experiment to find the capacitance of a capacitor. The charge on the capacitor is measured for different values of p.d. across the capacitor. The results are shown.

charge on capacitor/μC	*p.d. across capacitor*/V
1·9	1·0
4·6	2·0
9·6	4·0

The best estimate of the capacitance is

A 1·9 μF

B 2·2 μF

C 2·3 μF

D 2·4 μF

E 2·6 μF.

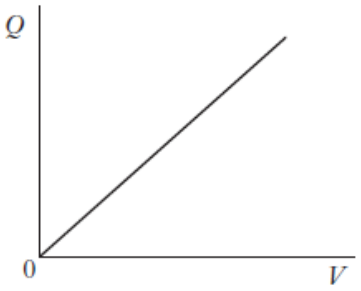
2013 **10.** The capacitance of a capacitor is 1000 μF. The potential difference (p.d.) across the capacitor is 100 V. The charge stored by the capacitor is 0·10 C.

The charge on the capacitor is now reduced to half its original value.

Which row in the table shows the capacitance of the capacitor and the p.d. across the capacitor, for this new value of charge?

	Capacitance/μF	*p.d.*/V
A	1000	200
B	500	100
C	1000	100
D	500	50
E	1000	50

2013 **11.** The graph shows how the charge, Q, stored on a capacitor varies with the potential difference, V, across the capacitor.



Which of the following statements is/are correct?

I The gradient of the graph represents the capacitance of the capacitor.

II The area under the graph represents the work done in charging the capacitor.

III The energy, E, stored in the capacitor is given by the equation $E = QV$.

A I only

B II only

C III only

D I and II only

E I, II and III

2014 **11.** A capacitor has a capacitance of 20 μF.

The energy stored in the capacitor is 4·0 mJ.

The potential difference across the capacitor is

A 5·0 V

B 20 V

C 80 V

D 200 V

E 400 V.

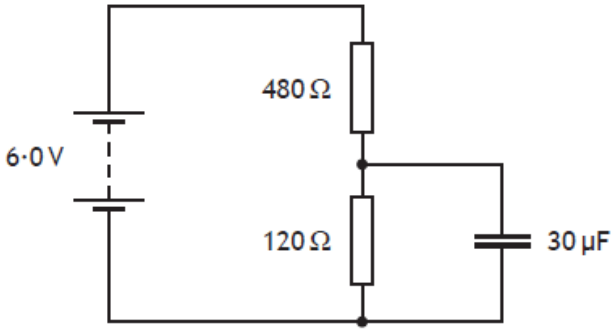
2016 20. A 20 μF capacitor is connected to a 12 V d.c. supply.
The maximum charge stored on the capacitor is

A $1{\cdot}4 \times 10^{-3}$ C
B $2{\cdot}4 \times 10^{-4}$ C
C $1{\cdot}2 \times 10^{-4}$ C
D $1{\cdot}7 \times 10^{-6}$ C
E $6{\cdot}0 \times 10^{-7}$ C.

2017 17. A 20 μF capacitor is connected to a 12 V d.c. supply.
The maximum charge stored on the capacitor is

A $1{\cdot}4 \times 10^{-3}$ C
B $2{\cdot}4 \times 10^{-4}$ C
C $1{\cdot}4 \times 10^{-4}$ C
D $1{\cdot}7 \times 10^{-6}$ C
E $6{\cdot}0 \times 10^{-7}$ C.

2017 18. A circuit containing a capacitor is set up as shown.



The supply has negligible internal resistance.
The maximum energy stored in the capacitor is

A $5{\cdot}4 \times 10^{-4}$ J
B $3{\cdot}5 \times 10^{-4}$ J
C $1{\cdot}4 \times 10^{-4}$ J
D $3{\cdot}4 \times 10^{-5}$ J
E $2{\cdot}2 \times 10^{-5}$ J.

2018 **17.** A 24·0 μF capacitor is charged until the potential difference across it is 125 V.
The charge stored on the capacitor is

A $5{\cdot}21 \times 10^{6}$ C

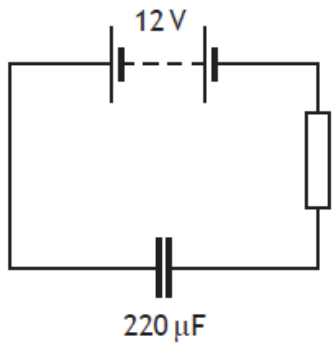
B $7{\cdot}75 \times 10^{-2}$ C

C $1{\cdot}50 \times 10^{-3}$ C

D $3{\cdot}00 \times 10^{-3}$ C

E $1{\cdot}92 \times 10^{-7}$ C.

2018 **18.** A circuit is set up as shown.



When the capacitor is fully charged the energy stored in the capacitor is

A $1{\cdot}6 \times 10^{-5}$ J

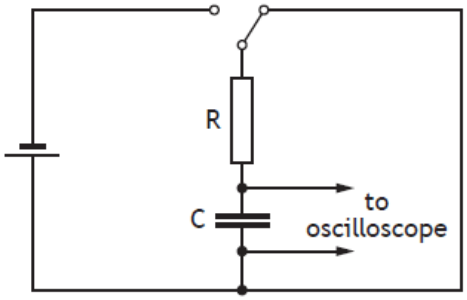
B $1{\cdot}3 \times 10^{-3}$ J

C $2{\cdot}6 \times 10^{-3}$ J

D $1{\cdot}6 \times 10^{-2}$ J

E $1{\cdot}6 \times 10^{4}$ J.

2018 19. The circuit shown is used to charge and then discharge a capacitor C.



Which pair of graphs shows how the potential difference V across the capacitor varies with time t during charging and discharging?