1 A capacitor is connected to a 6.0 V battery. The charge on the capacitor is 42 pC.
What is the energy stored by the capacitor?

☒ **A** 1.3×10^{-10} J

☒ **B** 2.5×10^{-10} J

☒ **C** 1.3×10^{-7} J

☒ **D** 2.5×10^{-7} J

(Total for Question = 1 mark)

2 A capacitor with an initial charge Q_0 is discharging through a resistor.
The time constant of the circuit is the time for the charge to fall to

☒ **A** $0.25 \, Q_0$

☒ **B** $0.37 \, Q_0$

☒ **C** $0.50 \, Q_0$

☒ **D** $0.63 \, Q_0$

(Total for Question = 1 mark)

3 Electrons are released from a heated metal filament.

This process is known as

☒ **A** excitation.

☒ **B** ionisation.

☒ **C** photoelectric emission.

☒ **D** thermionic emission.

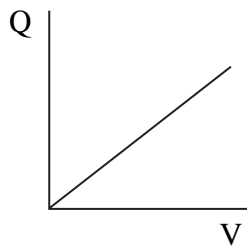**(Total for Question = 1 mark)**

4 A capacitor is discharging through a resistor and the time constant is 5.0 s. The time taken for the capacitor to lose half its charge is

☒ **A** 0.14 s

☒ **B** 0.81 s

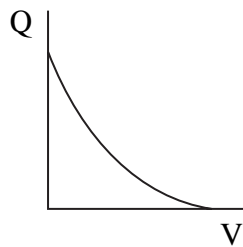☒ **C** 3.2 s

☒ **D** 3.5 s

(Total for Question   1 mark)
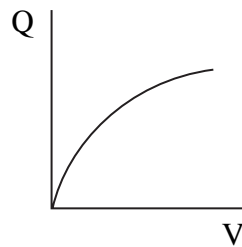
5 An uncharged capacitor is connected to a battery.

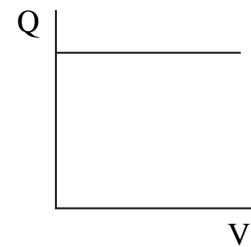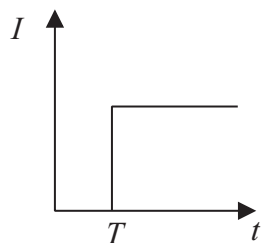Which graph shows the variation of charge with potential difference across the capacitor?

A ☒   **B** ☒   **C** ☒   **D**   ☒
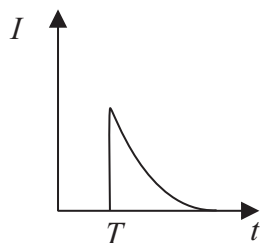
(Total for Question = 1 mark)

6 An electric motor is connected via a switch to a battery. A graph is plotted to show the variation of current I with time t. The switch is closed at time T.
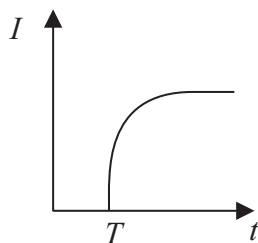
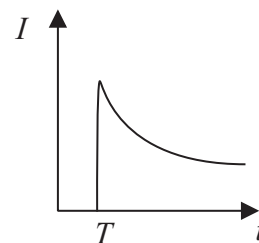Which of the following graphs is correct?

    A   B   C   D

☒   **A**

☒   **B**

☒   **C**

☒   **D**

(Total for Question   1 mark)

7 The process by which electrons are released from a heated filament is known as

☒   **A** thermionic emission.

☒   **B** photoelectric emission.

☒   **C** ionisation.

☒   **D** excitation.

(Total for Question   1 mark)

8 The potential difference across a capacitor is V. The energy stored on the capacitor is X joules. The potential difference across this capacitor is increased to $3\ V$. The energy stored, in joules, is increased to

☒   **A** $3X$

☒   **B** $6X$

☒   **C** $9X$

☒   **D** $27X$
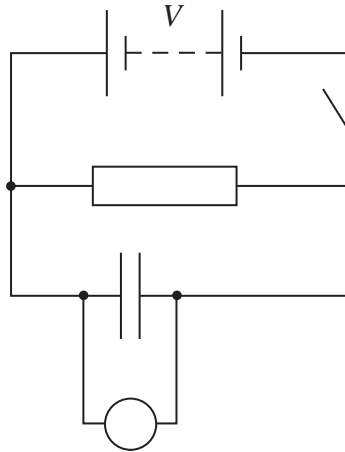
(Total for Question = 1 mark)

9 A capacitor of capacitance C has a potential difference V across it. The energy stored on the capacitor is Z joules. A second capacitor of capacitance $C/2$ has a potential difference $2V$ across it.
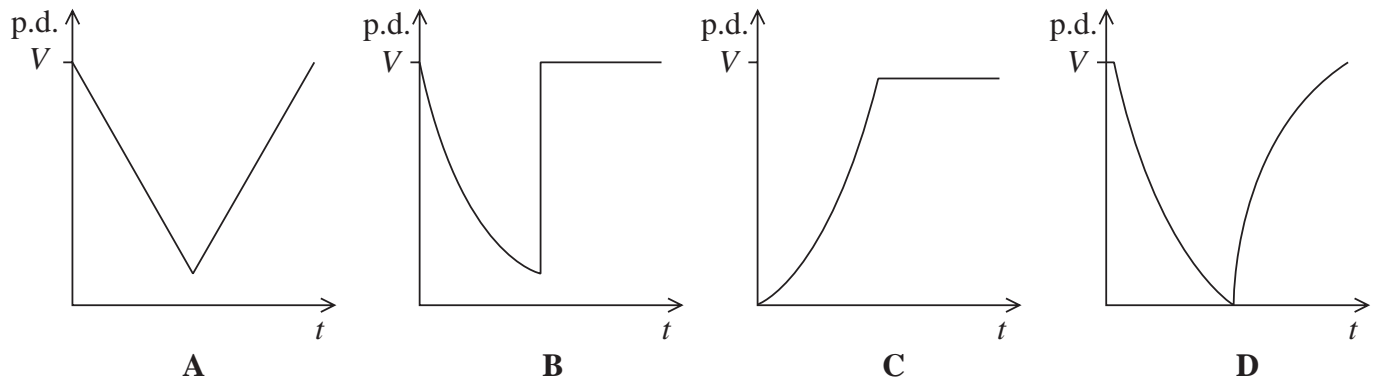The energy stored on the second capacitor is

☒ **A**   Z

☒ **B**   2Z

☒ **C**   4Z

☒ **D**   8Z

(Total for Question = 1 mark)

10   The capacitor shown in the circuit below is initially charged to a potential difference (p.d.) *V* by closing the switch.
The power supply has negligible internal resistance.

The switch is opened and the p.d. across the capacitor allowed to fall. A short time later the switch is closed again. Select the graph that shows how the p.d. across the capacitor varies with time, after the switch is opened.

☒ **A**

☒ **B**

☒ **C**

☒ **D**

(Total for Question = 1 mark)