1 Two spheres carry equal charges uniformly spread over their surfaces. They are close to each other but not touching.
Each sphere experiences an electrostatic force F.
This force could be reduced to $\frac{1}{2}F$ by

☒ **A** doubling the distance between the surfaces of the spheres.

☒ **B** doubling the distance between the centres of the spheres.

☒ **C** halving the charge on both spheres.

☒ **D** halving the charge on one of the spheres.

(Total for Question = 1 mark)

2 What is the acceleration of an electron at a point in an electric field where the electric field strength is 2.0×10^{4} N C^{-1}?

☒ **A** 2.8×10^{-16} m s^{-2}

☒ **B** 3.2×10^{-15} m s^{-2}

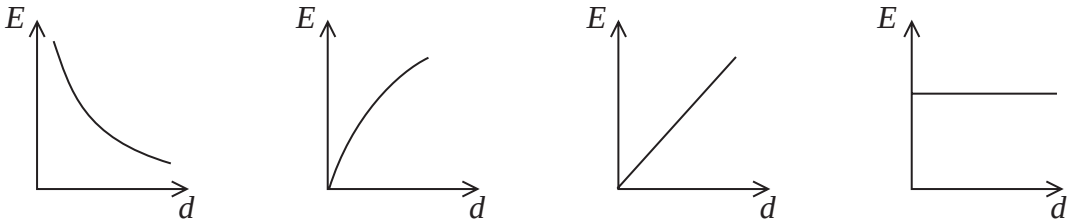
☒ **C** 1.8×10^{11} m s^{-2}

☒ **D** 3.5×10^{15} m s^{-2}

(Total for Question = 1 mark)

3 Two parallel, conducting plates are connected to a battery. One plate is connected to the positive terminal and the other plate to the negative terminal. The plate separation *d* is gradually increased while the plates stay connected to the battery.

Select the graph that shows how the electric field strength *E* between the plates varies with separation *d*.



A **B** **C** **D**

☒ **A**

☒ **B**

☒ **C**

☒ **D**

(Total for Question = 1 mark)

4 A unit of electric field strength is

☒ **A** $J C^{2}$

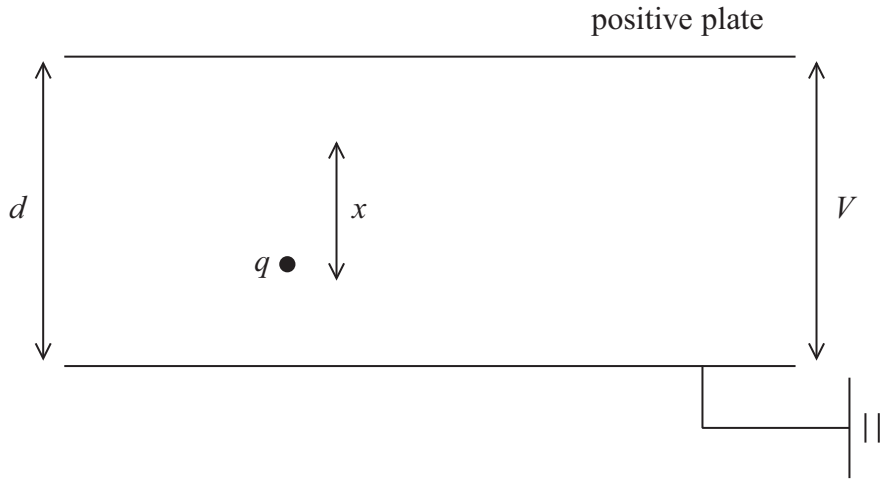
☒ **B** $N m^{2} C^{2}$

☒ **C** $N m C^{1}$

☒ **D** $N C^{1}$

(Total for Question 1 mark)

5 The diagram shows two parallel plates a distance d apart. There is a potential difference V across the two plates. A particle, charge q, is placed between the plates as shown. The particle is attracted to the positive plate and moves through a distance x.



Which of the following expressions gives the work done on the particle as it moves through the distance x?

☒ **A** $\frac{qV}{xd}$

☒ **B** $\frac{qVx}{d}$

☒ **C** $\frac{V}{xdq}$

☒ **D** $\frac{xV}{qd}$

(Total for Question 1 mark)

6 The distance, in m, from an electron at which the electric field strength equals 6.4×10^{8} J C^{-1} m^{-1} is

☒ **A** 1.7×10^{-19}

☒ **B** 6.0×10^{-19}

☒ **C** 2.2×10^{-18}

☒ **D** 1.5×10^{-9}

(Total for Question = 1 mark)

7 Which of the following is a property of a uniform electric field?

☒ **A** A field that doesn't change over time.

☒ **B** A field that acts equally in all directions.

☒ **C** A field that only produces a force on moving charged particles.

☒ **D** A field that has the same strength at all points.

(Total for Question 1 mark)

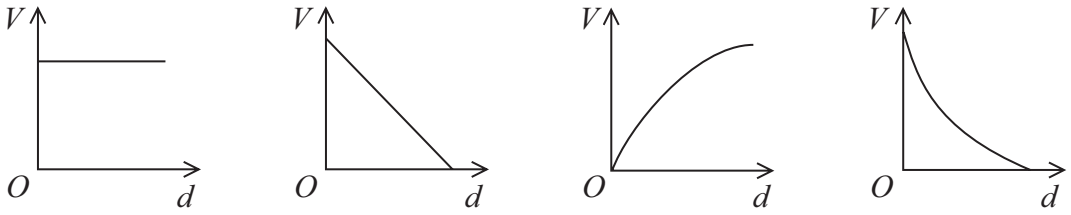
8 A potential difference of 50 V is applied between two identical parallel aluminium plates. The plates are separated by a distance of 10 mm.

Which combination of potential difference and separation would double the electric field strength?

	Separation/mm	**Potential difference/ V**
☒ **A**	20	100
☒ **B**	20	25
☒ **C**	10	100
☒ **D**	10	25

(Total for Question 1 mark)

9 The electric field strength between two parallel plates is uniform. Which graph shows how the potential V varies with distance d from the positive plate?



A **B** **C** **D**

☒ **A**

☒ **B**

☒ **C**

☒ **D**

(Total for Question 1 mark)

10 The force on a proton at a point in an electric field is 4.8×10^{-19} N.

The electric field strength at that point is

☒ **A** 7.7×10^{38} N C^{-1} in the opposite direction to the force.

☒ **B** 7.7×10^{38} N C^{-1} in the same direction as the force.

☒ **C** 3.0×10^{19} N C^{-1} in the opposite direction to the force.

☒ **D** 3.0 N C^{-1} in the same direction as the force.

(Total for Question 1 mark)

11 Two protons, separated by a distance x, experience a repulsive force F. If the separation is reduced to $x/3$ the force between the protons will be

☒ **A** $F/9$

☒ **B** $F/3$

☒ **C** $3F$

☒ **D** $9F$

(Total for Question = 1 mark)