

34

Synergy

Education

Name: _____

2018

PRELIMINARY
HSC QUIZ 2

Physics

Module 4: Electricity & Magnetism

General Instructions

- Reading time – 1 minute
- Working time – 15 minutes
- Write using black or blue pen
- Draw diagrams using pencil
- NESA approved calculators may be used
- A data sheet and a Periodic Table are provided at the back of this paper

General Instructions

Section I – 11 marks (pages 2 – 4)

- Attempt Questions 1 – 6
- Allow about 15 minutes for this part

Section I
11 marks

Attempt Questions 1 - 6

Allow about 15 minutes for this part.

Question 1

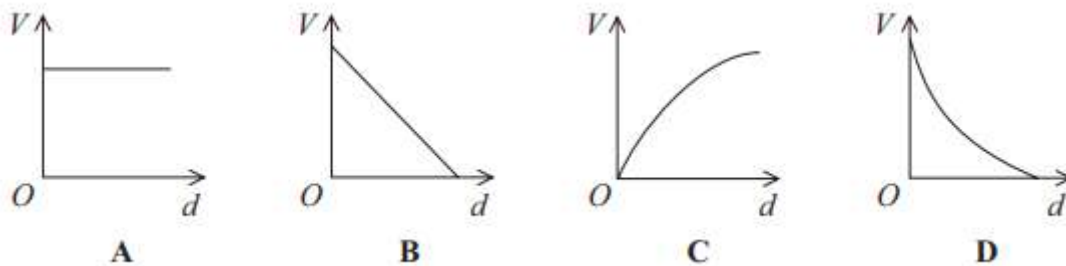
A potential difference of 50V is applied between two identical parallel aluminum plates. The plates are separated by a distance of 10mm.

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

	Separation (mm)	Potential Difference (V)
a)	20	100
b)	20	35
c)	10	100
d)	10	25

Question 2

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



- a) A
- b) B
- c) C
- d) D

Question 3

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

The electric field strength at that point is

- a) $7.7 \times 10^{-38} \text{ NC}^{-1}$ in the opposite direction to the force
- b) $7.7 \times 10^{-38} \text{ NC}^{-1}$ in the same direction as the force
- c) $3.0 \times 10^{-19} \text{ NC}^{-1}$ in the opposite direction to the force
- d) 3.0 NC^{-1} in the same direction as the force

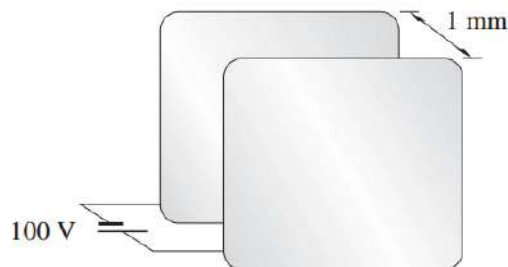
Question 4

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) $9F$

Question 5 (HSC 2007 – Qu 11)

Two parallel metal plates are 1 mm apart. A potential difference of 100 V is applied as shown.

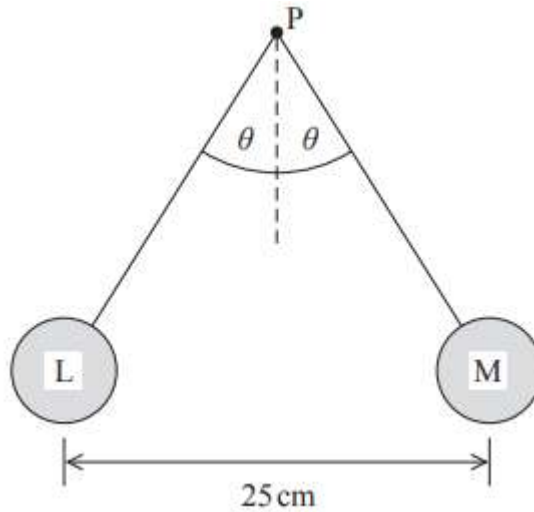


What is the magnitude of the uniform electric field between the plates?

- a) 10^{-3} V m^{-1}
- b) 10^{-1} V m^{-1}
- c) 10^{-2} V m^{-1}
- d) 10^5 V m^{-1}

Question 6 (6 marks)

Two small spheres L and M are attached to non-conducting threads and suspended from a point P. Each sphere is given an equal positive charge of $4.0 \times 10^{-7} \text{ C}$. The spheres hang in equilibrium as shown in the diagram.



The mass of each sphere is 2.7g

By considering the forces acting on one of the spheres, calculate the tension in the thread and the angle θ . (6 marks)

.....

.....

.....

.....

.....

.....

.....

.....