

# 5.1 Electric Fields

## Question Paper

Course	DPIB Physics
Section	5. Electricity & Magnetism
Topic	5.1 Electric Fields
Difficulty	Easy

**Time allowed:** 20  
**Score:** /10  
**Percentage:** /100

### Question 1

Identify the unit defined as 'the charge carried by an electric current of one ampere in one second'.

- A. Current.
- B. Potential difference.
- C. Coulomb.
- D. Ampere.

[1 mark]

### Question 2

Two different equations can be used to calculate the same physical quantity,  $x$ .

$$x = \frac{\Delta q}{\Delta t} \text{ and } x = nAvq$$

What quantity is represented by  $x$ ?

- A. Drift velocity.
- B. Current.
- C. Charge on a charge carrier.
- D. Potential difference.

[1 mark]

### Question 3

Select the correct quantity and unit for this definition;

'the rate of flow of electric charge past a cross-section of material'

	Quantity	Unit
A.	charge	coulomb
B.	charge	ampere
C.	current	coulomb
D.	current	ampere

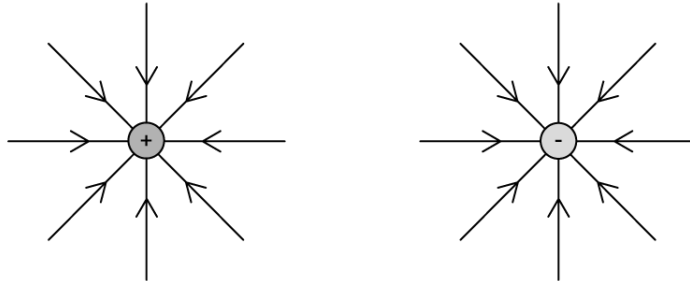
[1 mark]

### Question 4

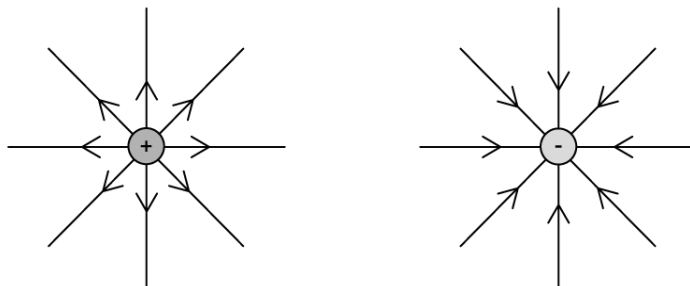
An electric field is a region of space in which an electric charge is subjected to a force. Electric fields can be represented with vector diagrams showing the direction of force around a point charge.

Select the pair of diagrams which correctly represent the field lines around a positive and negative charge.

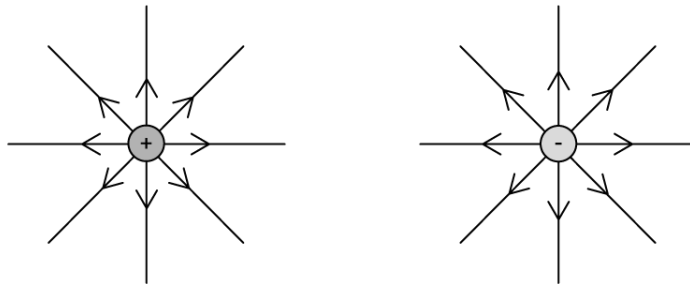
A.



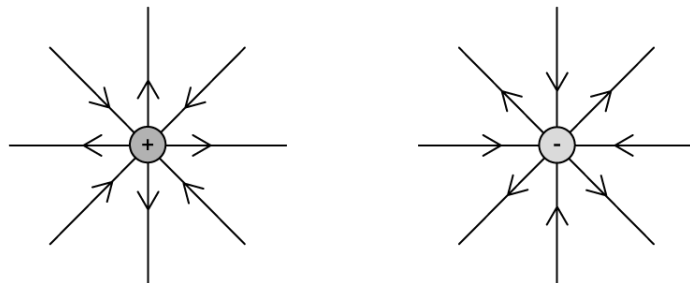
B.



C.



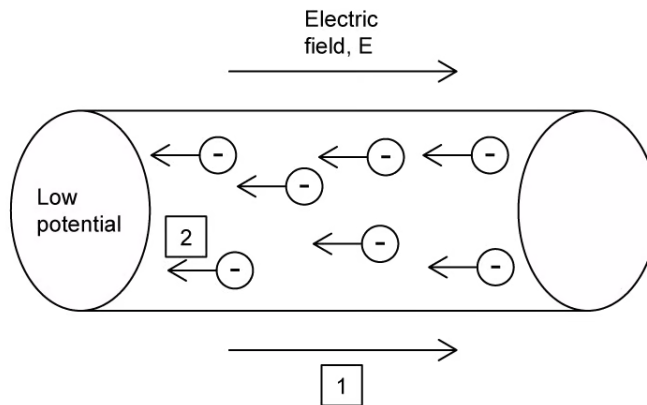
D.



[1 mark]

### Question 5

The diagram shows charged particles moving in a metallic material. Choose the line which correctly identifies the missing labels.



	1	2
A.	current	electric current
B.	voltage	drift speed
C.	voltage	electric current
D.	current	drift speed

[1 mark]

### Question 6

Which of the following is a possible drift speed for delocalised electrons in a copper wire?

- A.  $12 \times 10^{-8} \text{ m s}^{-1}$
- B.  $4.5 \times 10^{-4} \text{ m s}^{-1}$
- C.  $8.6 \text{ m s}^{-1}$
- D.  $3.0 \times 10^8 \text{ m s}^{-1}$

[1 mark]

### Question 7

Which statement correctly describes a property of the drift velocity,  $v$ .

- A.  $v$  is indirectly proportional to current,  $I$
- B.  $v$  is directly proportional the to charge carrier density,  $n$
- C.  $v$  is directly proportional to current,  $I$
- D.  $v$  is directly proportional the to cross-sectional area of the conductor,  $A$

[1 mark]

### Question 8

Determine the energy of 4 eV in Joules.

- A.  $6.4 \times 10^{-19}$  J
- B.  $6.4 \times 10^{-13}$  J
- C. 6.4 J
- D. 2.1 J

[1 mark]

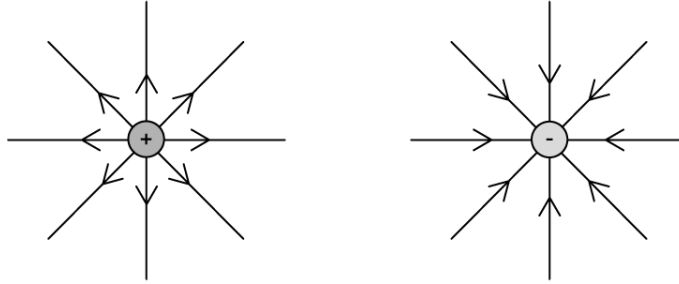
### Question 9

Identify the electrical item most likely to use direct current.

- A. Washing machine.
- B. Laptop.
- C. Reading lamp.
- D. Kettle.

[1 mark]

Question 10



For electric field strength, identify the correct equation and description of the diagram.

	Equation	Description
A.	$E = \frac{F}{q}$	The strength of the electric field is <b>proportional</b> to the number of lines per unit cross-sectional area
B.	$E = \frac{F}{q}$	The strength of the electric field is <b>indirectly proportional</b> to the number of lines per unit cross-sectional area
C.	$F = \frac{E}{q}$	The strength of the electric field is <b>proportional</b> to the number of lines per unit cross-sectional area
D.	$F = \frac{E}{q}$	The strength of the electric field is <b>indirectly proportional</b> to the number of lines per unit cross-sectional area

[1 mark]