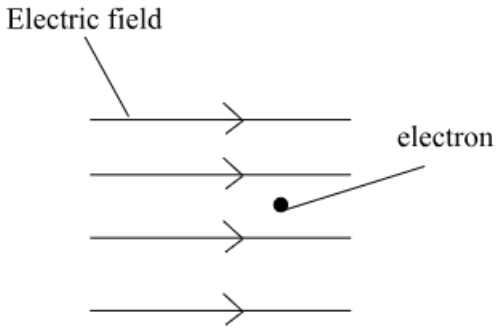
Pearson Edexcel GCE Physics

Additional Support Worksheets

The A Level Physics worksheet series are designed to provide support to students in grasping foundational level knowledge of key terms and concepts. By engaging with these materials, students can build strong foundations in key principles. The series encourages active learning through thought provoking questions, so learners can reflect on their understanding and boost confidence.

Contents

1 An electron is placed in a uniform electric field directed to the right,as shown.



Which of the following is the direction of the force on the electron?

[x] **A** To the right

[x] **B** To the left

[x] **C** Upwards

[x] **D** Downwards

(Total for Question 1 = 1 mark)

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2 A charge of + 4.0 x 10^{-6} C in an electric field experiences a force of 8.0 x 10^{-3} N.

Which of the following gives the force on a -2.0 x 10^{-6} C charge in the same field

[x] **A** +4.0 x 10^{-3} N

[x] **B** -4.0 x 10^{-3} N

[x] **C** +8.0 x 10^{-3} N

[x] **D** -8.0 x 10^{-3} N

(Total for Question 2 = 1 mark)

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3 Two charges are 0.20 m apart and exert a force of 1.0 N on each other. The distance between the two charges is increased to 0.40 m.

Which of the following expressions give the new force?

[x] **A** 0.25 N

[x] **B** 0.50 N

[x] **C** 2.0 N

[x] **D** 4.0 N

(Total for Question 3 = 1 mark)

4 Point P is a distance of 30 cm from a point charge. The electric field of strength is 4500 N C^{-1} at point P.

Which of the following gives the magnitude of the point charge?

[x] **A** 1.35 x 10^{-3} C

[x] **B** 4.05 x 10^{-7} C

[x] **C** 4.05 x 10^{-7} C

[x] **D** 4.50 x 10^{-6} C

(Total for Question 4 = 1 mark)

5 Which statement correctly describes the relation between electric field strength and electric potential?

[x] **A** The electric field strength is equal to the electric potential.

[x] **B** The electric field strength equal to the rate of change of electric potential with distance.

[x] **C** The electric field strength is equal to the negative rate of change of electric potential with distance.

[x] **D** The electric field strength is equal to the square of the electric potential.

(Total for Question 5 = 1 mark)

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6 A potential difference is applied to two parallel plates. The two parallel plates are a distance of 0.10 m apart.

The electric field strength between the two plates is E.

Which of the following is the new value of electric field strength between the plates?

[x] **A** $\frac{E}{4}$

[x] **B** $\frac{E}{2}$

[x] **C** $2E$

[x] **D** unchanged

(Total for Question 6 = 1 mark)

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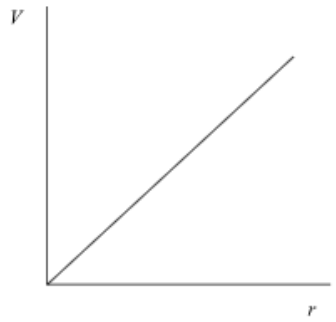
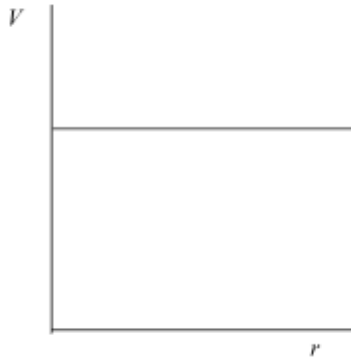
7 Which of the following graphs represents the variation of potential V with distance r from a positive point charge?

Header

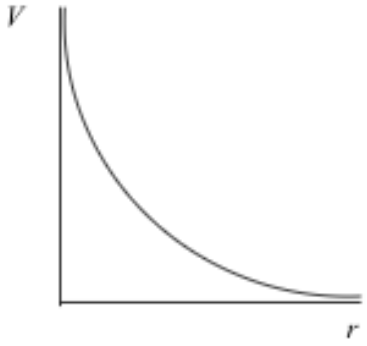
[x] **A**



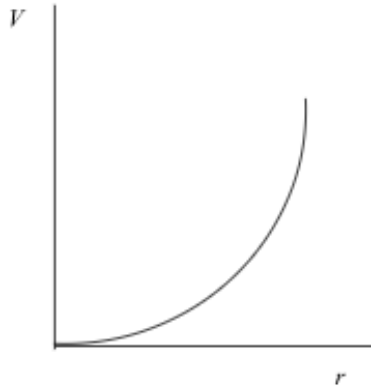
[x] **B**



[x] **C**



[x] **D**



(Total for Question 7 = 1 mark

8 A capacitor is charged when connected across a potential difference of 12 V.

The charge stored on the capacitor is 6 μC.

Which of the following is the capacitance of the capacitor in μF?

[x] **A** 0.08

[x] **B** 0.25

[x] **C** 0.50

[x] **D** 2.00

(Total for Question 8 = 1 mark)

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9 A capacitor of capacitance 4.0 μFis connected to a power supply. The capacitor is charged and the potential difference across it is 200 V.

Which of the following is the energy stored by the capacitor in J?

[x] **A** 0.0004

[x] **B** 0.04

[x] **C** 0.08

[x] **D** 0.16

(Total for Question 9 = 1 mark)

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10 A 2200 μF capacitor is discharged through a 10 kΩ resistor.

Which of the following is the time constant of the circuit in s?

[x] **A** 0.022

[x] **B** 2.2

[x] **C** 22

[x] **D** 2200

(Total for Question 10 = 1 mark)

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11 A coil of 200 turns is placed in a magnetic field such that the magnetic flux through each turn is 2.5×10^{-4} Wb.

Which of the following is the total flux linkage of the coil in Wb?

[x] **A** 1.25×10^{-6}

[x] **B** 2.50×10^{-4}

[x] **C** 5.00×10^{-2}

[x] **D** 1.25×10^{-6}

(Total for Question 11 = 1 mark)

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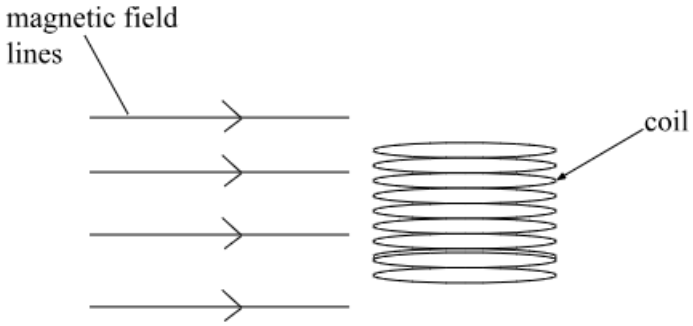
12 A coil of 10 turns is placed in a uniform magnetic field of flux density 0.5 T, as shown.



The area of each turn is 0.02 m² and the plane of the coil is perpendicular to the field.

Which of the following is the total flux linkage of the coil?

[x] **A** 0.01 Wb

[x] **B** 0.10 Wb

[x] **C** 0.50 Wb

[x] **D** 0.20 Wb

(Total for Question 12 = 1 mark)

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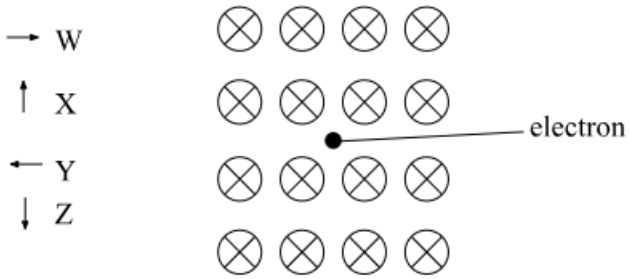
13 An electron moves in the direction W in a magnetic field that points into the page, as shown.



Which of the following gives the direction in which the magnetic force acts?

[x] **A** W

[x] **B** X

[x] **C** Y

[x] **D** Z

(Total for Question 13 = 1 mark)

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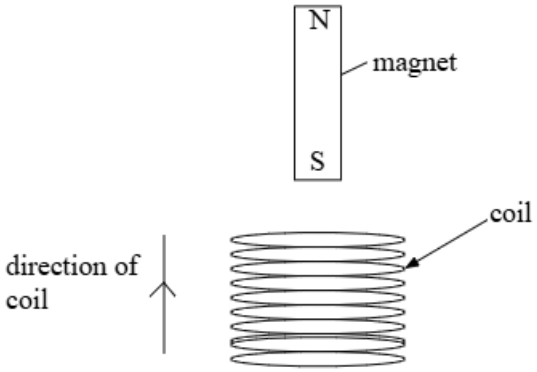
14 A coil of resistance R is moving towards a magnet, as shown.



Which of the following will increase the magnitude of the e.m.f. induced in a coil?

[x] **A** Reducing the number of turns in the coil

[x] **B** Increasing the speed of relative motion between the coil and the magnet

[x] **C** Decreasing the resistance *R* of the coil

[x] **D** Increasing the resistance *R* of the coil

(Total for Question 14 = 1 mark)

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15 A primary coil is connected to a variable current source, and a secondary coil is placed close to it.

Which of the following will increase the e.m.f. induced in the secondary coil?

[x] **A** Reducing the number of turns in the secondary coil

[x] **B** Increasing the distance between the coils

[x] **C** Increasing how quickly the current in the primary coil changes

[x] **D** Using wires of greater cross-sectional area in the secondary coil

(Total for Question 15 = 1 mark)

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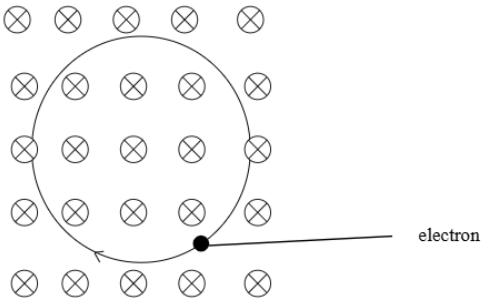
16 An electron is moving at a speed v perpendicular to a uniform magnetic field of flux density B

The electron follows as circular path of radius R.



The uniform magnetic flux density is increased to 4B. The speed of the electron is halved.

Which of the following is the radius of the electron?

[x] **A** $\frac{R}{8}$

[x] **B** $\frac{R}{4}$

[x] **C** $2R$

[x] **D** $8R$

(Total for Question 16 = 1 mark)

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17 A capacitor of 4 μFis discharged through a resistor of 500 Ω.

The initial p.d. across the capacitor is 9 V.

Which of the following expressions gives the p.d. across the capacitor after 1 ms?

[x] **A** $V = 9e^{-1 \times 10^{-3}/(500 \times 4 \times 10^{=6})}$

[x] **B** $V = 9e^{-1\,(500 \times 4\,)}$

[x] **C** $V = 9e^{-500 \times 4 \times 10^{=6}/(1 \times 10^{-3})}$

[x] **D** $V = 9(1 - e^{-1 \times 10^{-3}/(500 \times 4 \times 10^{=6})})$

(Total for Question 17 = 1 mark)

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18 The peak current I_0 in an AC 3.5 A.

Which of the following is the r.m.s. current?

[x] **A** 1.75 A

[x] **B** 2.47 A

[x] **C** 3.5 A

[x] **D** 7 A

(Total for Question 18 = 1 mark)

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19 When the potential difference across a Capacitor is 4 V, the energy stored by the capacitor is 8 J.

Which of the following gives the energy stored by the capacitor in J when the potential difference across the capacitor is 8 V?

[x] **A** 8

[x] **B** 16

[x] **C** 32

[x] **D** 64

(Total for Question 19 = 1 mark)

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20 Which of the following units is equivalent to the farad?

[x] **A** CV^{-1}

[x] **B** JV^{-1}

[x] **C** $\Omega\mathrm{s}^{-1}$

[x] **D** sJ^{-1}

(Total for Question 20 = 1 mark)
