

GCSE Physics A (Gateway)

J249/03 Physics A P1-P4 and P9 (Higher Tier)

Question Set 28

Multiple Choice Questions

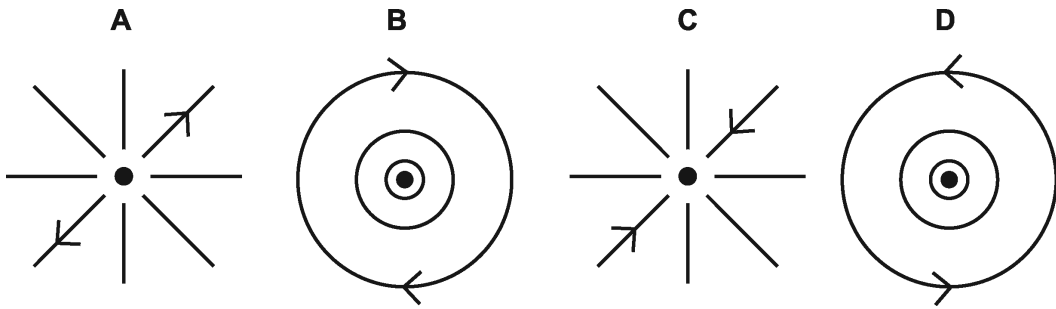
P4: Magnetism and Magnetic Fields

1

The diagram shows a wire carrying an electric current.



Which diagram shows the magnetic field viewed from above, with the current coming towards you?



Your answer

[1]

2

Which of the following is **not** needed to generate a.c. in an alternator?

- A Changing magnetic field
- B Coil of wire
- C Commutator segment
- D Rotating magnet

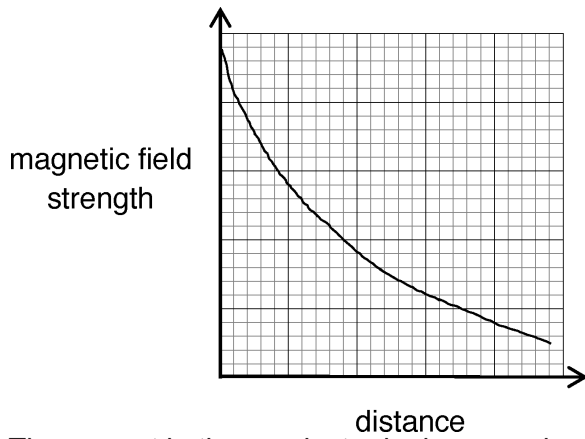
Your answer

[1]

3

A student measures the magnetic flux density around a current carrying conductor at increasing distances from the conductor.

She plots her results.



The current in the conductor is decreased and a new graph plotted. Which is the correct graph?

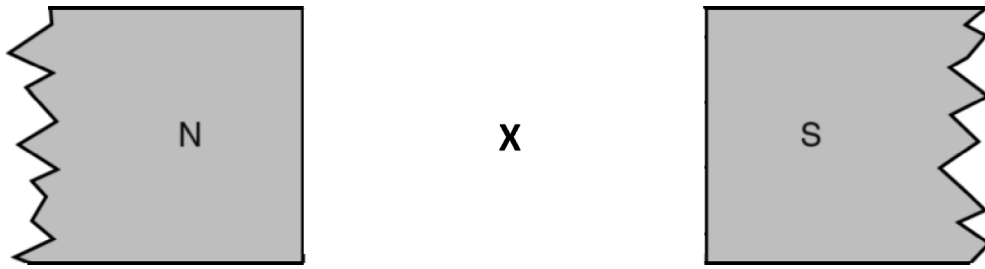
<p>A</p> <p>A graph with a grid showing an inverse relationship curve, similar to the original graph.</p>	<p>B</p> <p>A graph with a grid showing a straight line with a negative slope, representing a linear relationship.</p>
<p>C</p> <p>A graph with a grid showing a straight line with a negative slope, representing a linear relationship.</p>	<p>D</p> <p>A graph with a grid showing an inverse relationship curve, similar to the original graph.</p>

Your answer

[1]

4

The diagram shows two poles of a magnet.



X is the position of a wire carrying a current perpendicularly into the paper.

Which direction does the wire move?

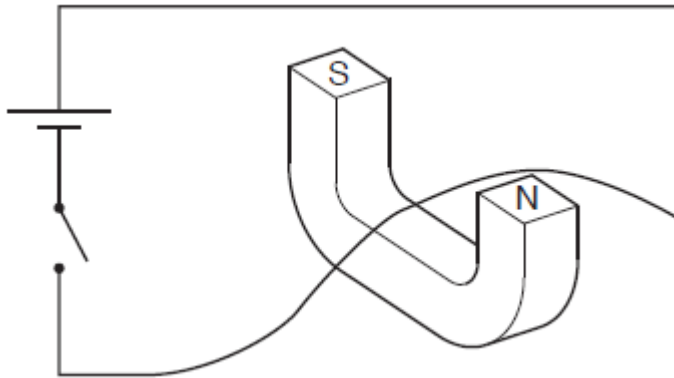
- A ↓
- B →
- C ←
- D ↑

Your answer

[1]

5

A wire is placed inside a horseshoe magnet.



Which direction will the wire move when the switch is closed?

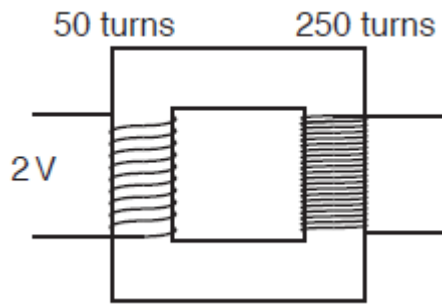
- A Downwards
- B Left
- C Right
- D Upwards

Your answer

[1]

6

What output voltage does the transformer produce?



A 0.2 V

B 0.4 V

C 5 V

D 10 V

Your answer

[1]

7

Which does **not** increase the magnetic effect of a solenoid?

A Increasing the cross-sectional area of the solenoid

B Increasing the current in the solenoid

C Increasing the number of turns on the solenoid

D Putting a soft iron core in the solenoid

Your answer

[1]

8

A 0.5 m length of wire is placed inside four different magnetic fields.

Magnetic Field	Force on wire (N)	Current in wire (A)
A	2.0	0.1
B	2.0	0.2
C	4.0	0.1
D	4.0	0.4

Which magnetic field has the **greatest** magnetic flux density?

Your answer

[1]

9

Which of these factors affects the strength of the magnetic field around a current-carrying wire?

- A** Direction of the current only
- B** Size of the current only
- C** Distance from the wire only
- D** Size of the current and distance from the wire

Your answer

[1]

Total Marks for Question Set 28: 9

Equations in physics

$$(\text{final velocity})^2 - (\text{initial velocity})^2 = 2 \times \text{acceleration} \times \text{distance}$$

$$\text{change in thermal energy} = \text{mass} \times \text{specific heat capacity} \times \text{change in temperature}$$

$$\text{thermal energy for a change in state} = \text{mass} \times \text{specific latent heat}$$

$$\text{energy transferred in stretching} = 0.5 \times \text{spring constant} \times (\text{extension})^2$$

$$\text{potential difference across primary coil} \times \text{current in primary coil} = \text{potential difference across secondary coil} \times \text{current in secondary coil}$$

Higher tier only –

$$\text{force on a conductor (at right angles to a magnetic field) carrying a current} = \text{magnetic flux density} \times \text{current} \times \text{length}$$

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