

GCSE Physics A (Gateway)

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

Question Set 28

Multiple Choice Questions

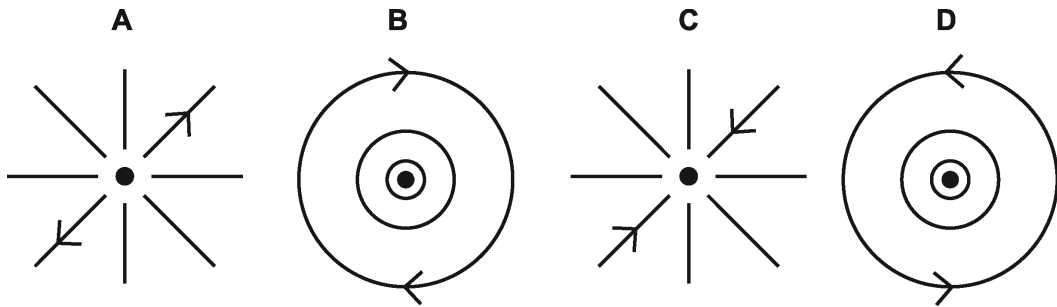
P4: Magnetism and Magnetic Fields

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

D

[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

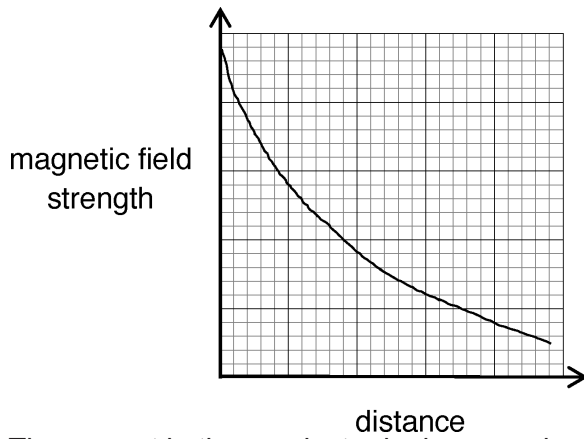
C

[1]

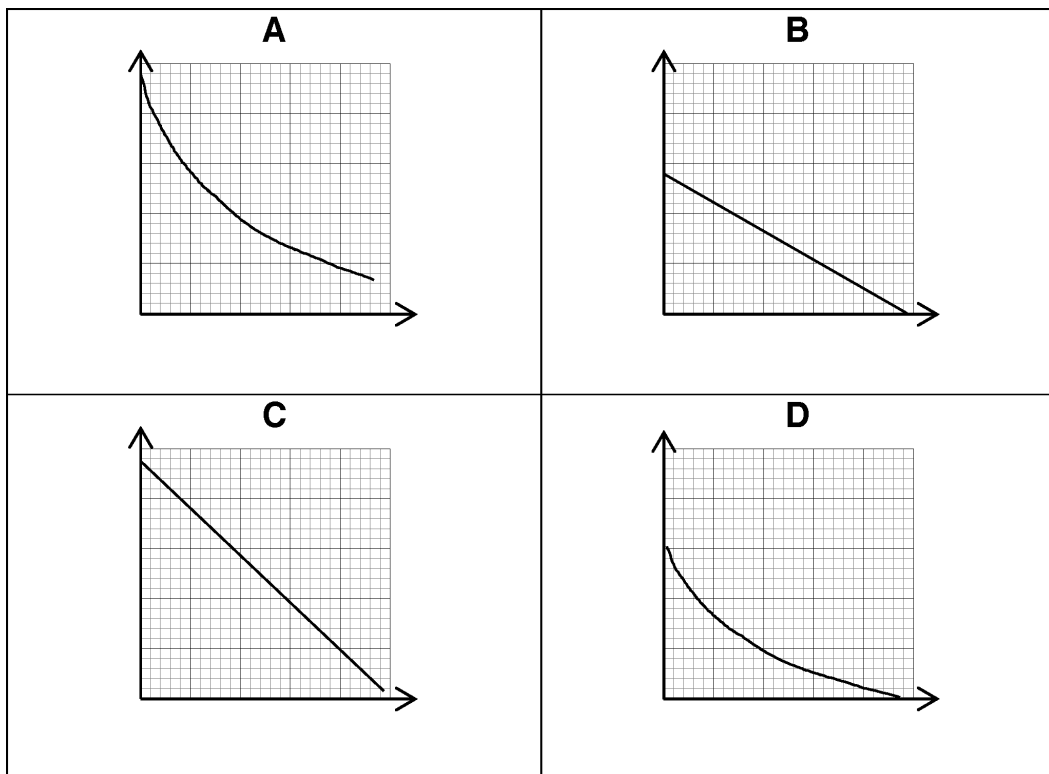
3

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?



Your answer

D

[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 ↑

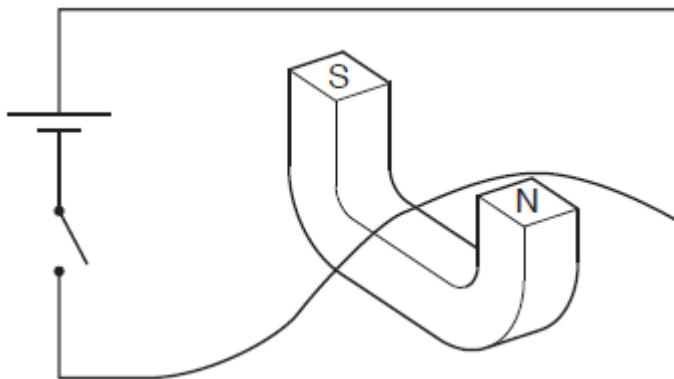
Your answer

A

[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

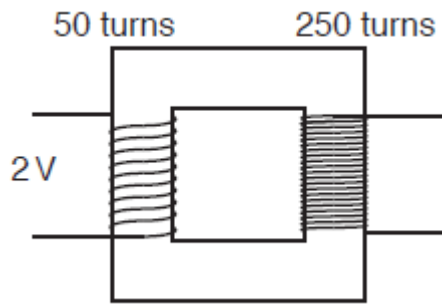
Your answer

A

[1]

6

What output voltage does the transformer produce?



$$\frac{50}{250} = \frac{2}{V_S}$$

$$V_S = 10$$

- A 0.2 V
- B 0.4 V
- C 5 V
- D 10 V

Your answer

D

[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

A

[1]

8

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

$$\frac{F}{IL} = B$$

| 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 |

F
40
20
80
20

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

Your answer

C

[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

D

[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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