Oxford Cambridge and RSA

GCSE Physics A (Gateway)

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

Question Set 28

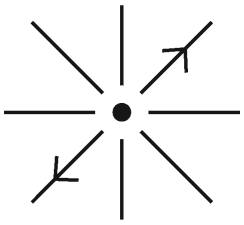
Multiple Choice Questions

P4: Magnetism and Magnetic Fields

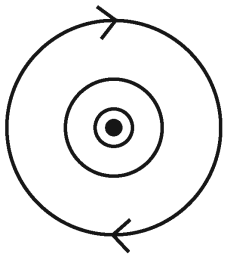
1 The diagram shows a wire carrying an electric current.

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

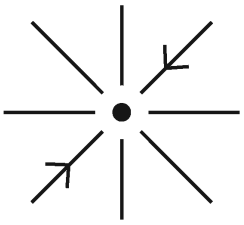
A



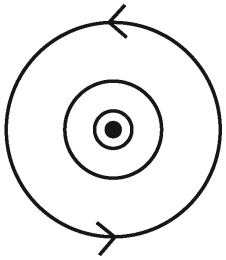
B



C



D



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

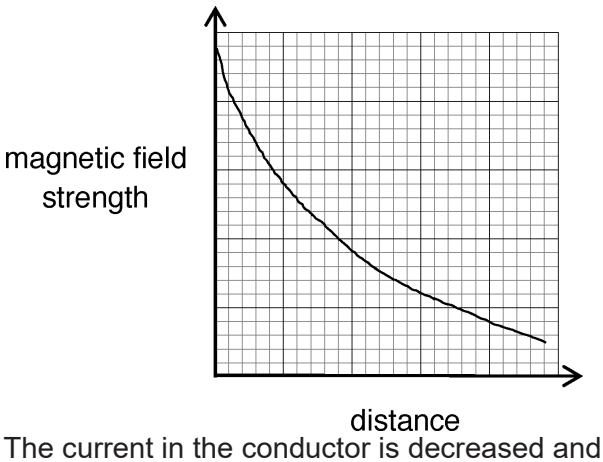
Your answer C

[1]

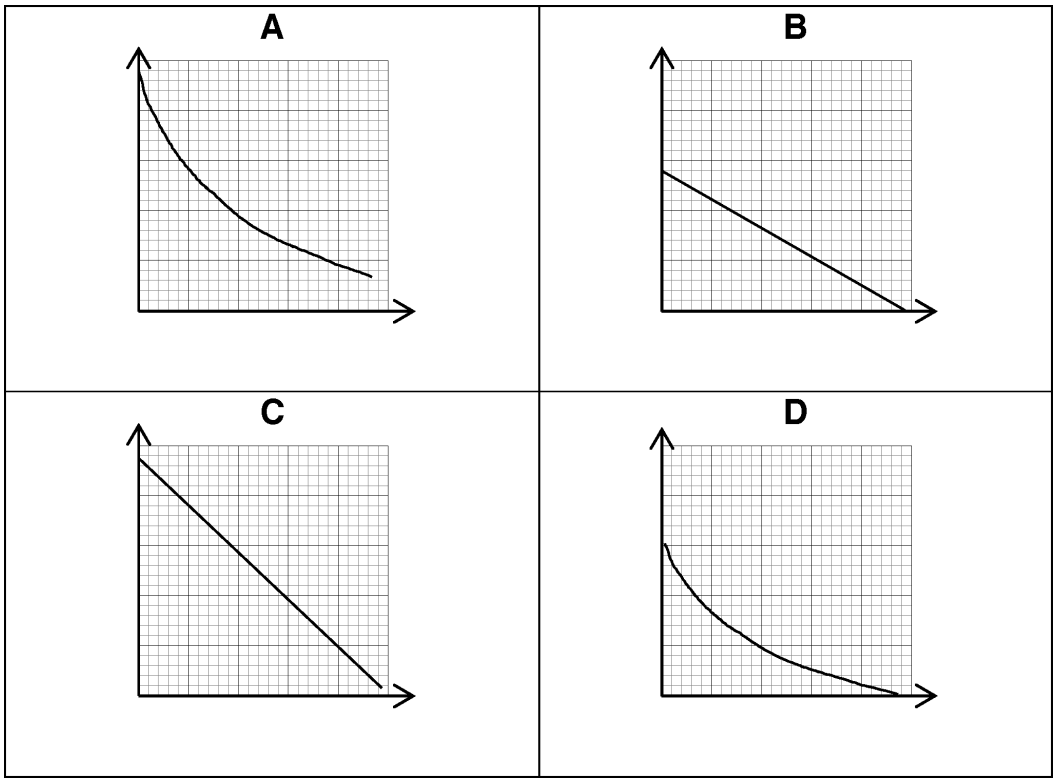
3

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 →

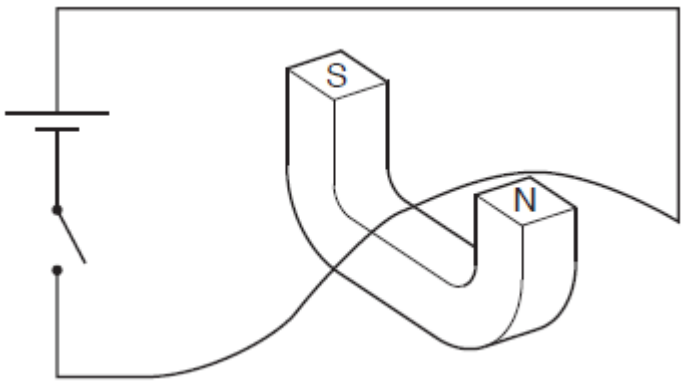
C ←

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

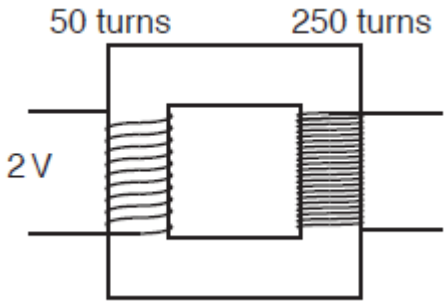
C Right

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.

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

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

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

(final velocity)^2 – (initial velocity)^2 = 2 × acceleration × distance

change in thermal energy = mass × specific heat capacity × change in temperature

thermal energy for a change in state = mass × specific latent heat

energy transferred in stretching = 0.5 × spring constant × (extension)^2

potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil

Higher tier only –

force on a conductor (at right angles to a magnetic field) carrying a current = magnetic flux density × current × length