

# Electromagnetic Effects

## Question Paper 1

Level	IGCSE
Subject	Physics (0625/0972)
Exam Board	Cambridge International Examinations (CIE)
Topic	General Physics
Sub-Topic	Electromagnetic Effects
Booklet	Question Paper 1

**Time allowed:** 24 minutes

**Score:** /19

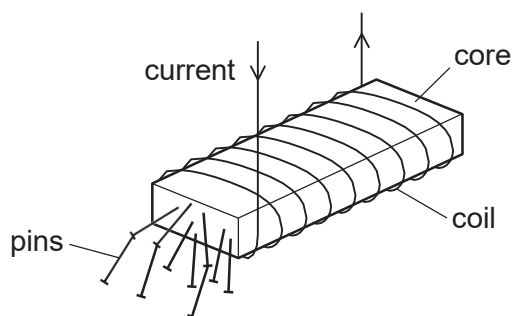
**Percentage:** /100

### Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	55%	50%	43%	35%	<30%

## Question 1

A strong electromagnet is used to attract pins.

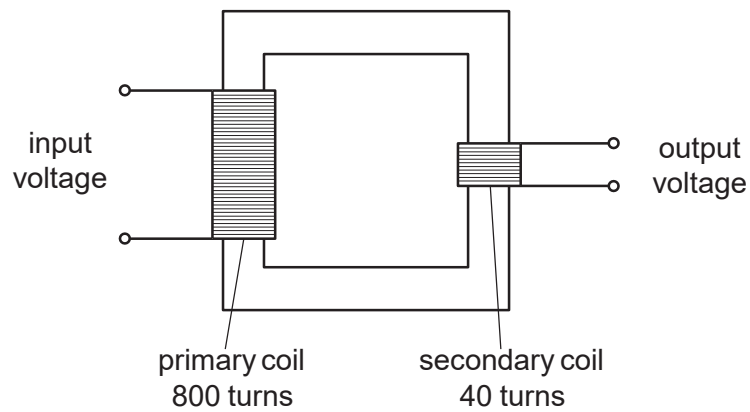


What happens when the current in the coil is halved?

- A. No pins are attracted.
- B. Some pins are attracted, but not as many.
- C. The same number of pins is attracted.
- D. More pins are attracted.

## Question 2

The diagram shows a transformer.



The input voltage is 240V.

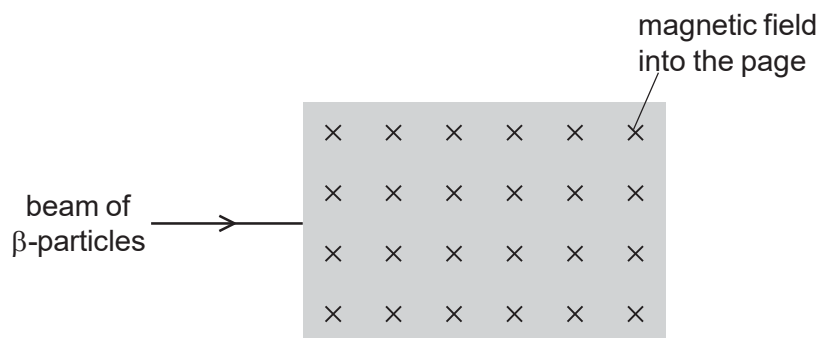
What is the output voltage?

- A 6.0V      B 12V      C 20V      D 40V

### Question 3

The diagram shows a shaded area where the direction of a magnetic field is into the page.

A beam of  $\beta$ -particles enters the field as shown.

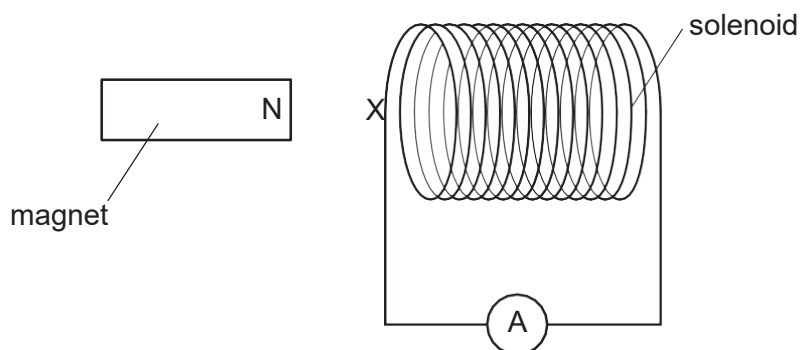


In which direction is the beam of  $\beta$ -particles deflected as they enter the magnetic field?

- A into the page
- B out of the page
- C down the page
- D up the page

## Question 4

A solenoid is connected in series with a sensitive ammeter. The N pole of a magnet is placed next to one end of the solenoid, marked X.



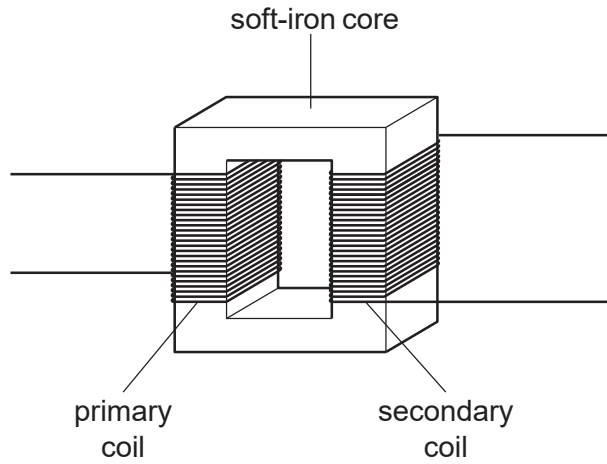
First, the N pole of the magnet is pushed towards X, then the magnet is pulled away from X. During both stages the ammeter deflects.

Which type of magnetic pole is induced at X during these two stages?

	as N pole moves towards X	as N pole moves away from X
A	N pole	N pole
B	N pole	S pole
C	S pole	N pole
D	S pole	S pole

## Question 5

The diagram shows a transformer.

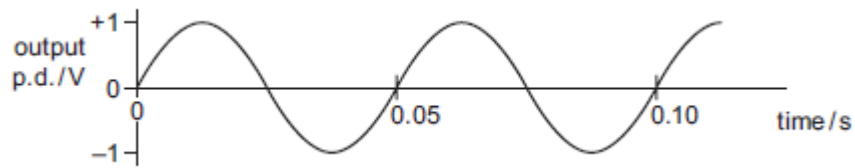


Which row describes the magnetic field in the soft-iron core and the magnetic field in the secondary coil when the transformer is operating?

	magnetic field	
	in soft-iron core	in secondary coil
A	changing	changing
B	changing	constant
C	constant	changing
D	constant	constant

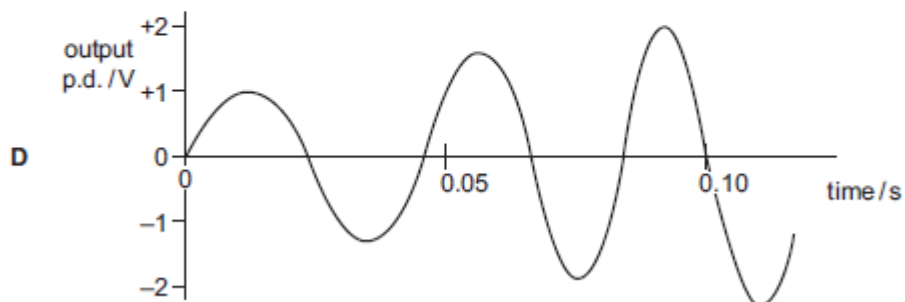
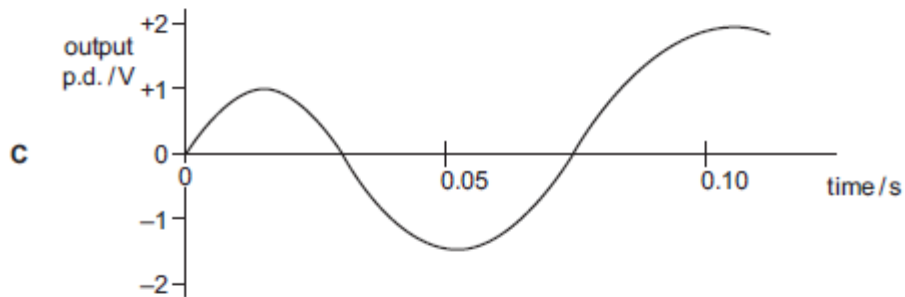
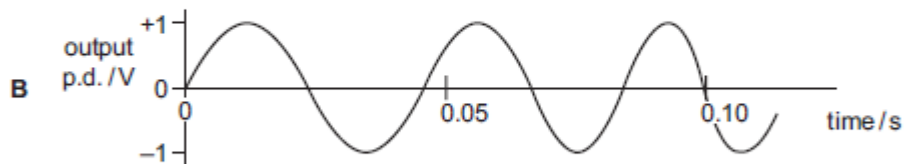
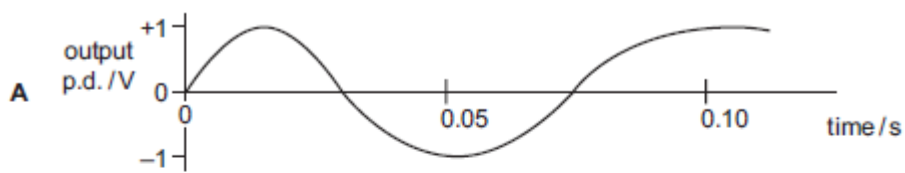
## Question 6

The graph shows the output of an a.c. generator. The coil in the generator rotates 20 times in one second.



The speed of rotation of the coil steadily increases.

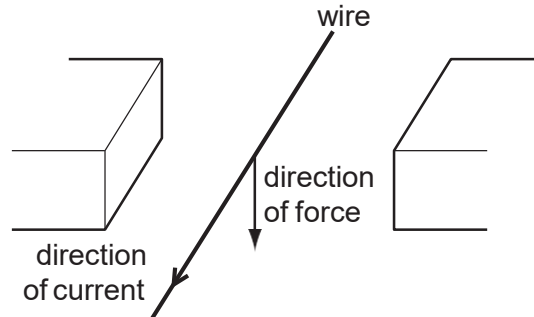
Which graph best shows how the output changes?







## Question 7

The diagram shows a wire placed between two magnetic poles of equal strength.

A current passes through the wire in the direction shown. The current causes a downward force on the wire.



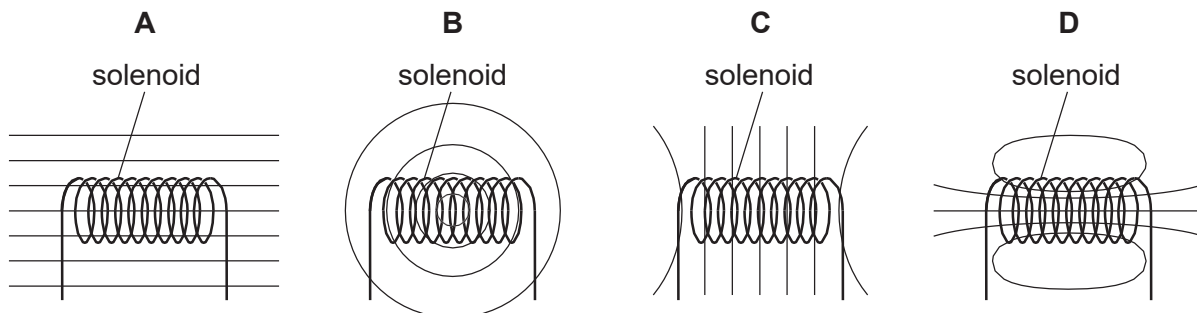
What is the arrangement of the magnetic poles?

- A 
- B 
- C 
- D 



## Question 8

Which diagram shows the pattern of the magnetic field produced by a current-carrying solenoid?



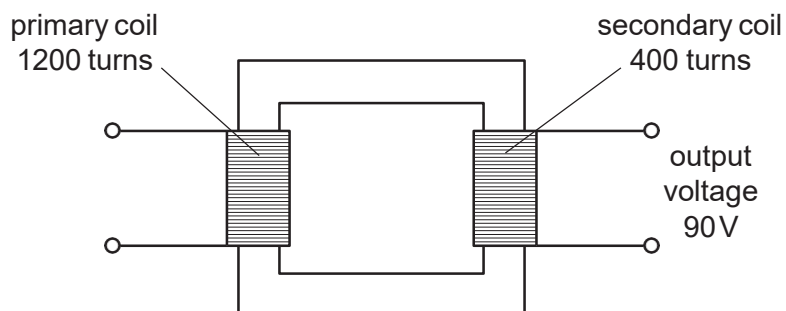
## Question 9

What is an advantage of transmitting electricity at a high voltage?

- A. It is faster.
- B. It is safer.
- C. Less energy is wasted.
- D. Less equipment is needed.

## Question 10

A transformer has 1200 turns on its primary coil and 400 turns on its secondary coil. An output voltage of 90 V is induced across the secondary coil.



What is the input voltage of the transformer?

- A 30V      B 90V      C 270V      D 1200V

## Question 11

An e.m.f. is induced across a wire when it moves through the magnetic field between the poles of a magnet.

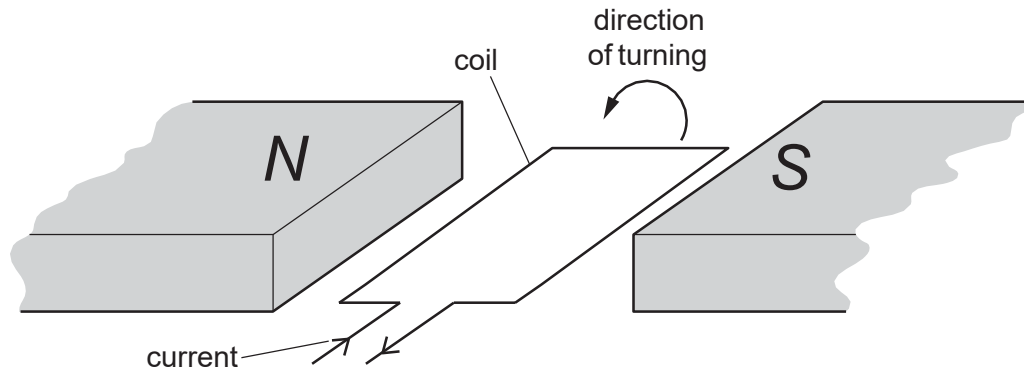
Which electrical device operates because of this effect?

- A. a battery
- B. a cathode-ray tube
- C. a generator
- D. a motor

## Question 12

The diagram shows a flat, rectangular coil placed between the poles of a magnet.

There is a current in the coil that makes it turn in the direction shown in the diagram.

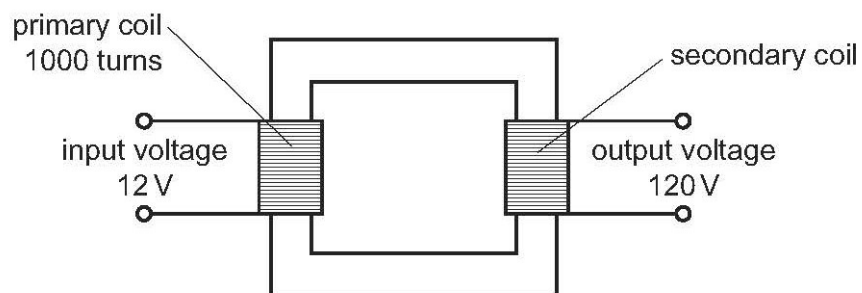


Which change would make the coil turn in the opposite direction?

- A. decreasing the current in the coil
- B. increasing the number of turns on the coil
- C. reversing both the direction of the current in the coil and the poles of the magnet
- D. reversing only the direction of the current in the coil

## Question 13

A transformer has 1000 turns on its primary coil. An input voltage of 12 V is applied to the primary coil, and an output voltage of 120 V is induced across the secondary coil.

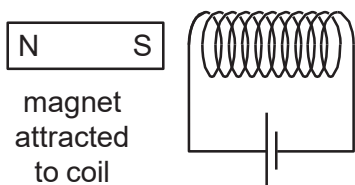


How many turns are on the secondary coil of the transformer?

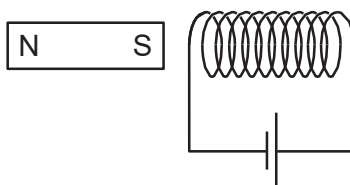
- A 100                      B 120                      C 1000                      D 10000

## Question 14

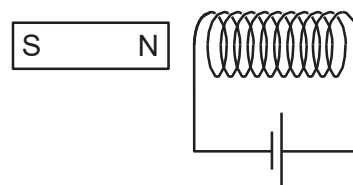
A student investigates the force on a bar magnet placed near a current-carrying coil. She carries out three different experiments.



experiment 1



experiment 2



experiment 3

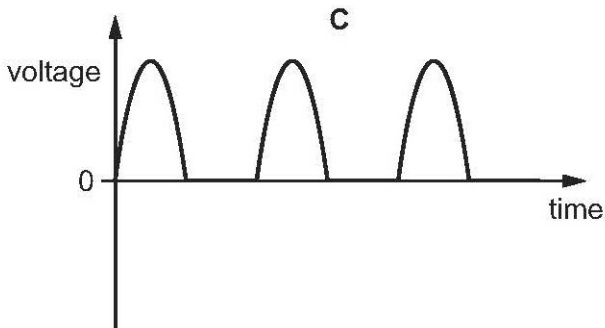
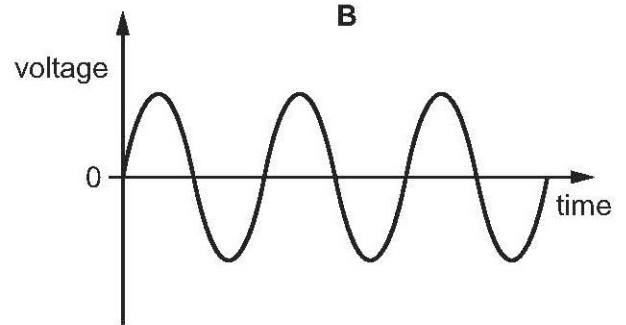
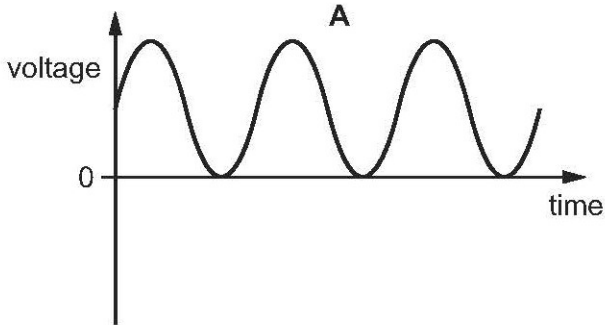
In experiment 1, the magnet is attracted to the coil.

Which row shows what happens in the other two experiments?

	experiment 2	experiment 3
A	magnet attracted	magnet attracted
B	magnet attracted	magnet repelled
C	magnet repelled	magnet attracted
D	magnet repelled	magnet repelled

# Question 15

Which diagram represents the voltage output of a simple a.c. generator?





## Question 16

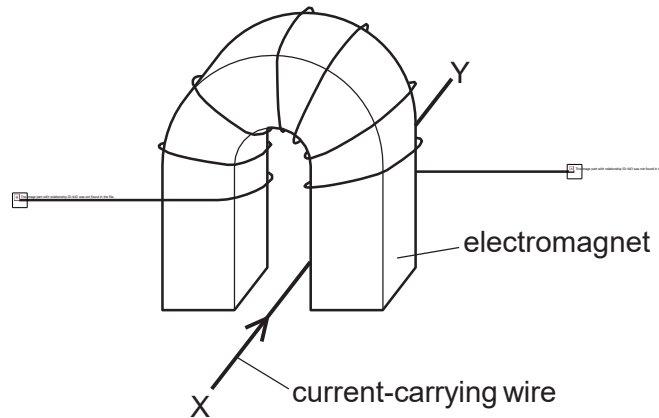
A step-up transformer is used before electricity is transmitted by overhead cables.

Which statement explains why the step-up transformer is used?

- A. It increases the current to increase the speed at which the electricity travels.
- B. It increases the current to reduce energy loss in the cables.
- C. It increases the voltage to increase the speed at which the electricity travels.
- D. It increases the voltage to reduce energy loss in the cables.

## Question 17

A current-carrying wire XY lies in the magnetic field between the two poles of a U-shaped electromagnet. A force acts on the wire XY because of the magnetic field.



Each of the following actions is carried out separately.

- The current in the wire XY is reversed.
- The magnetic field is reversed.
- Both the current in the wire XY and the magnetic field are reversed at the same time.

How many of these actions cause the direction of the force on the wire XY to be reversed?

A 0

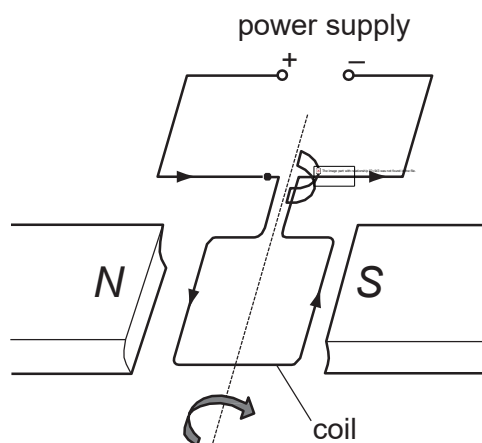
B 1

C 2

D 3

## Question 18

A current-carrying coil in a magnetic field experiences a turning effect.

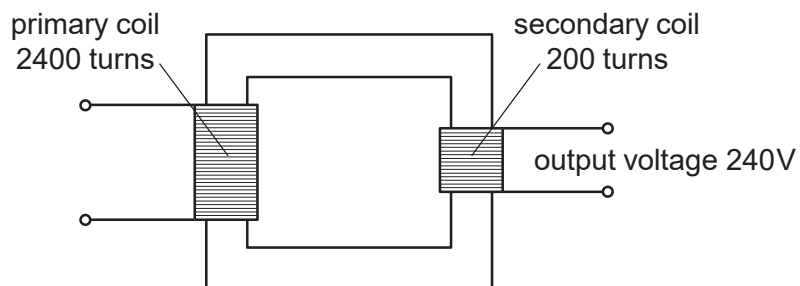


How can the turning effect be increased?

- A. Increase the number of turns on the coil.
- B. Reduce the size of the current.
- C. Reverse the direction of the magnetic field.
- D. Use thinner wire for the coil.

## Question 19

A transformer has 2400 turns on its primary coil and 200 turns on its secondary coil.



What input voltage is needed to give an output voltage of 240V?

- A 12V                      B 20V                      C 240V                      D 2880V