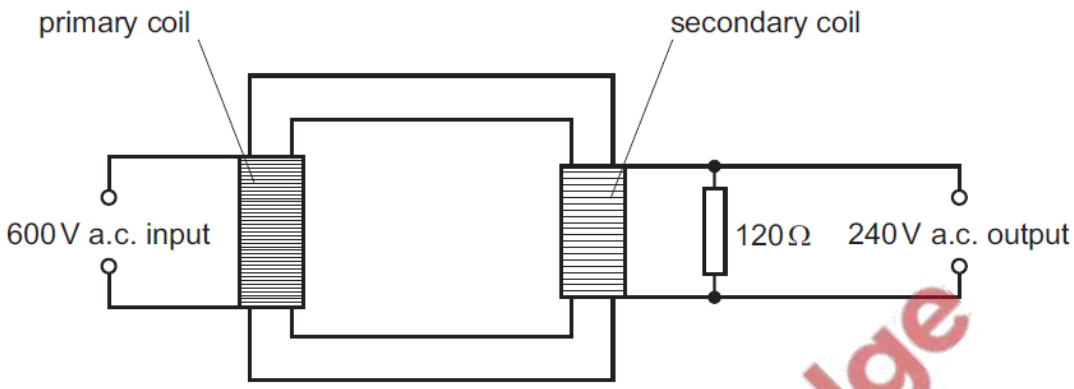
1. Nov/2021/Paper_11/No.34

A transformer with an efficiency of 100% has a primary voltage input of 600 V and a secondary voltage output of 240 V.

The secondary coil is attached to a resistor of resistance 120 Ω.

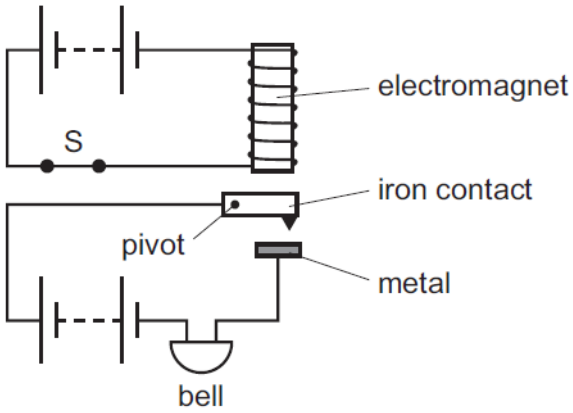


What is the power dissipated in the resistor and what is the current in the primary coil?

	power / W	current / A
A	120	0.20
B	120	5.0
C	480	0.80
D	480	1.3

2. Nov/2021/Paper_11/No.35

The diagram shows an alarm system in which the switch S is shown closed. The top circuit is arranged so that the electromagnet is positioned over the soft iron contact.



What happens when the switch S is opened?

	iron contact	bell
A	drops	rings
B	drops	stops ringing
C	moves up	rings
D	moves up	stops ringing

3. Nov/2021/Paper_21/No.7(either)

Fig. 7.1 shows a solenoid connected to an ammeter.

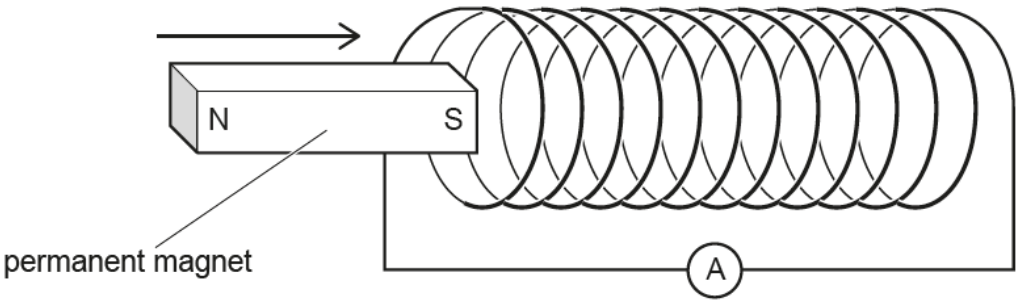


Fig. 7.1

The S-pole of a permanent magnet moves into the left-hand end of the solenoid.

The ammeter reading shows that there is a small positive current in the circuit.

(a) Explain why there is a current in the circuit when the magnet moves.

.....

.....

.....

..... [3]

(b) When the magnet is inside the solenoid, it stops moving. It is then pulled back out of the solenoid.

Explain what happens to the ammeter reading as the magnet moves out of the left-hand end of the solenoid.

.....

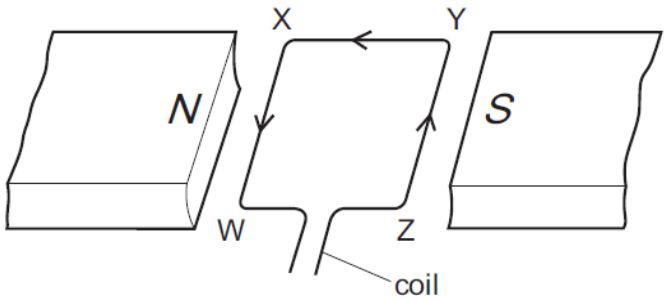
.....

..... [2]

[Total: 5]

4. June/2021/Paper_11/No.32

The diagram shows a horizontal rectangular wire coil WXYZ between the poles of a magnet.



There is a current in the coil in the direction shown.

Which statement is correct?

A The side WX experiences an upward force.

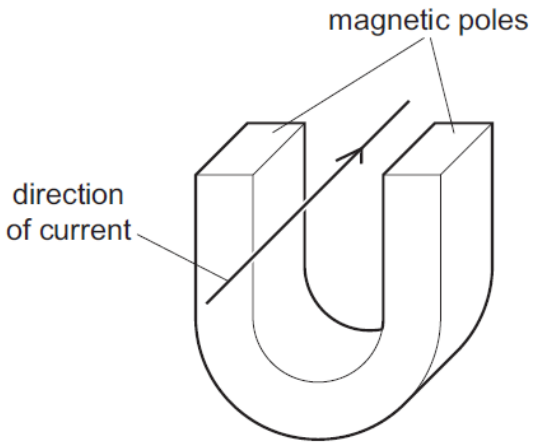
B The side XY experiences an outward force.

C The side YZ experiences an inward force.

D The side ZW experiences a downward force.

5. June/2021/Paper_11/No.34

The diagram shows a current-carrying conductor between the poles of a magnet. The force on the wire acts downwards.



Four changes are possible.

1 The current is increased.

2 A stronger magnet is used.

3 The current is reversed.

4 The poles exchange positions.

Which two changes made together keep the force acting downwards?

A 1 and 3 **B** 2 and 3 **C** 2 and 4 **D** 3 and 4

6. June/2021/Paper_11/No.35

In an alternating current (a.c.) generator, a magnet rotates near a coil of wire. The induced electromotive force (e.m.f.) in the coil is displayed on an oscilloscope screen.

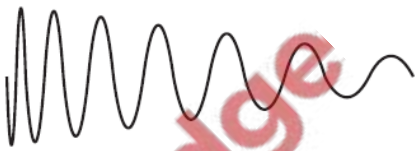
Which trace is produced as the magnet slows down?

A

B

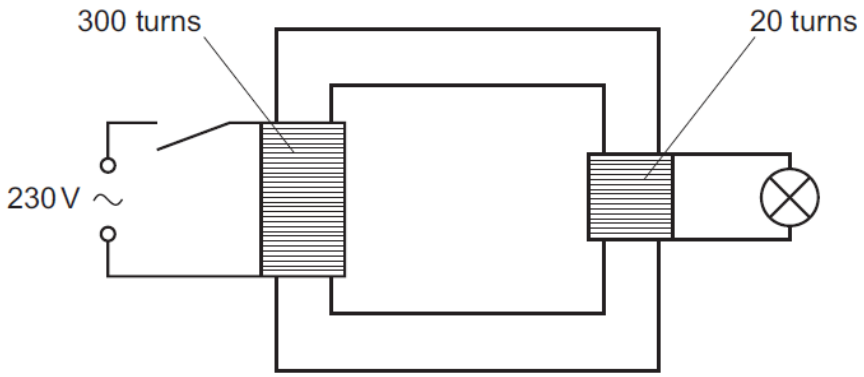
C

D



7. June/2021/Paper_11/No.36

A student uses a transformer to light a filament lamp using a 230 V a.c. supply. The lamp has a maximum voltage rating of 6.0 V.



What happens when the circuit is switched on?

A The lamp does not light at all.

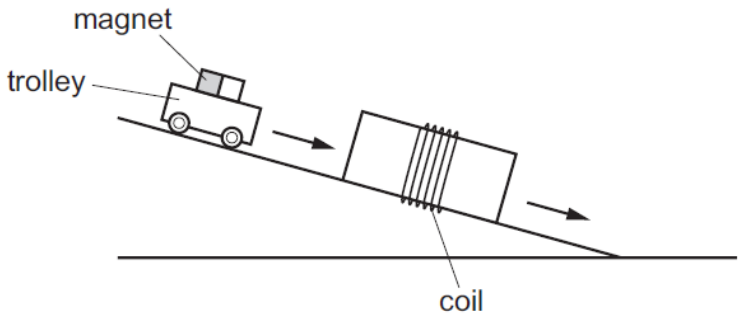
B The lamp lights at normal brightness.

C The lamp lights dimly.

D The lamp lights up brightly and then goes out.

8. June/2021/Paper_12/No.37

A trolley carrying a strong magnet rolls down a ramp at constant speed. It passes through a coil as shown.

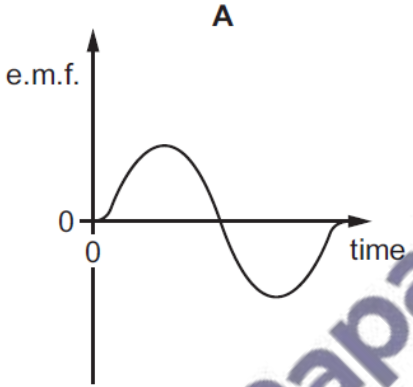


An electromotive force (e.m.f.) is induced in the coil. A graph of the e.m.f. against time is plotted.

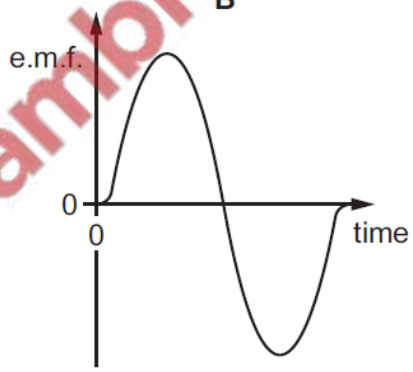
The experiment is repeated with different coils and with a steeper ramp. The trolley moves at a greater constant speed on the steeper ramp.

Which graph is produced using the coil with the least number of turns and the steepest ramp? All graphs are drawn to the same scale.

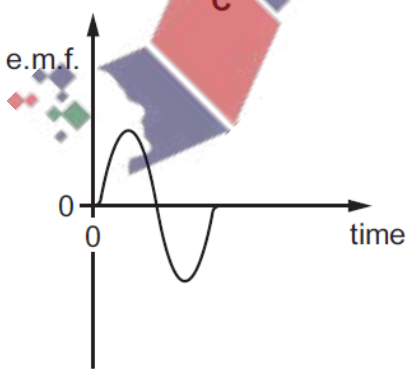
A



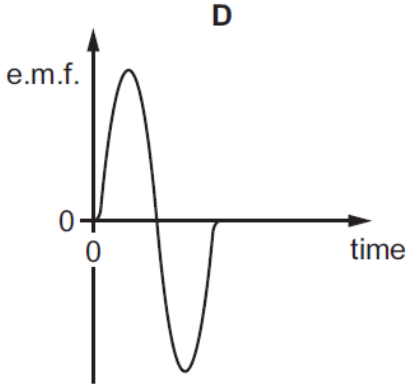
B



C



D



9. June/2021/Paper_21/No.6

A student moves a metal bar upwards between the poles of a magnet, as shown in Fig. 6.1.

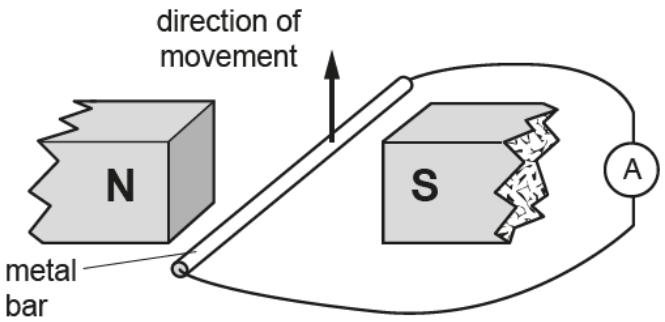


Fig. 6.1

The ammeter connected to the metal bar shows a small positive reading as the bar moves.

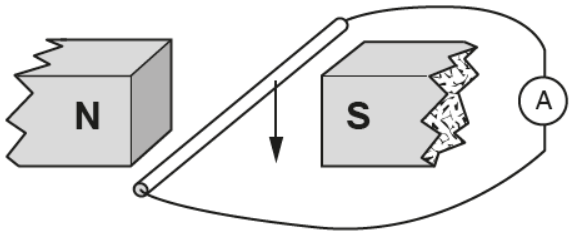
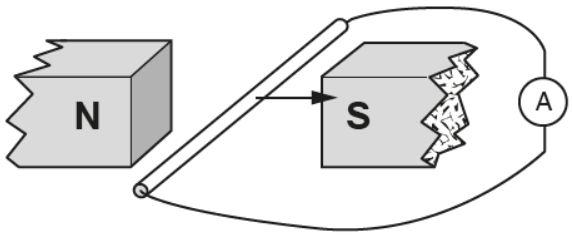
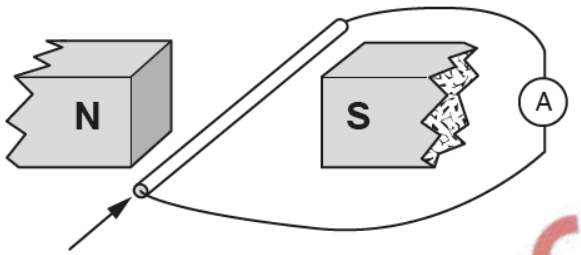
(a) Explain why there is a reading on the ammeter.

.....

..... [2]

(b) Complete Table 6.1 by stating what the ammeter shows when the metal bar moves in the direction shown by the arrow in each diagram.

Table 6.1

	reading shown on the ammeter
	.....
	.....
	.....

[3]

(c) The student finds that using a stronger magnet increases the reading on the ammeter.

State **one** other way in which the student can produce a larger reading on the ammeter, using the same rod.

.....

..... [1]

(d) Describe how Lenz's law applies when the bar is moved upwards.

.....

.....

..... [1]

[Total: 7]

10. June/2021/Paper_22/No.7

Fig. 7.1 shows part of a simple d.c. electric motor.

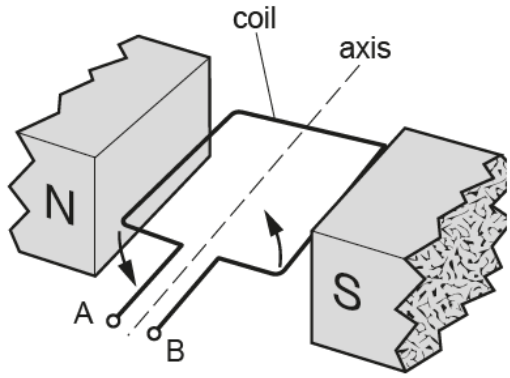


Fig. 7.1

The motor is connected to a battery with the positive terminal of the battery connected to terminal A.

(a) Explain why the coil turns in the direction shown.

.....

.....

.....

.....

..... [3]

(b) The turning effect is increased when the coil is wound around a soft-iron cylinder.

(i) Explain why this happens.

.....

.....

..... [2]

(ii) Suggest **one** other way to increase the turning effect of the motor.

..... [1]

[Total: 6]