2. Step-up transformer

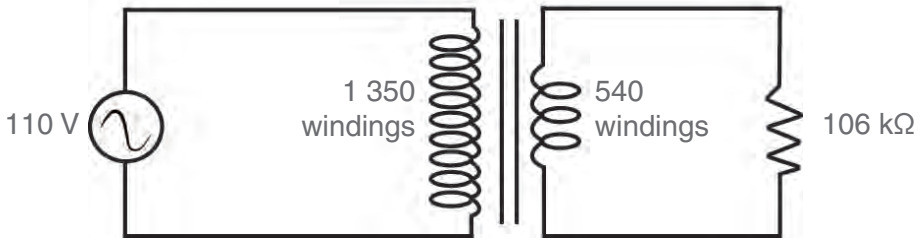
3. $$\frac{V_P}{N_P} = \frac{V_S}{N_S}$$
$$\frac{110}{1\,400} = \frac{V_S}{3\,610}$$
$$V_S = 283{,}64 \text{ V}$$

4. $$I = \frac{V}{R}$$
$$I = \frac{283{,}64}{3\,900}$$
$$I = 7{,}27 \times 10^{-2} \text{ A}$$

5. $$V_P I_P = V_S I_S$$
$$(110)I_P = 283{,}64(7{,}27 \times 10^{-2})$$
$$I_P = 0{,}19 \text{ A}$$

Exercise 29 Date:

1 Study the diagram and answer the questions that follow:



1.1 Calculate the tension in the secondary coil.

1.2 Calculate the current flowing through the resistor.

1.3 Calculate the current in the primary coil.

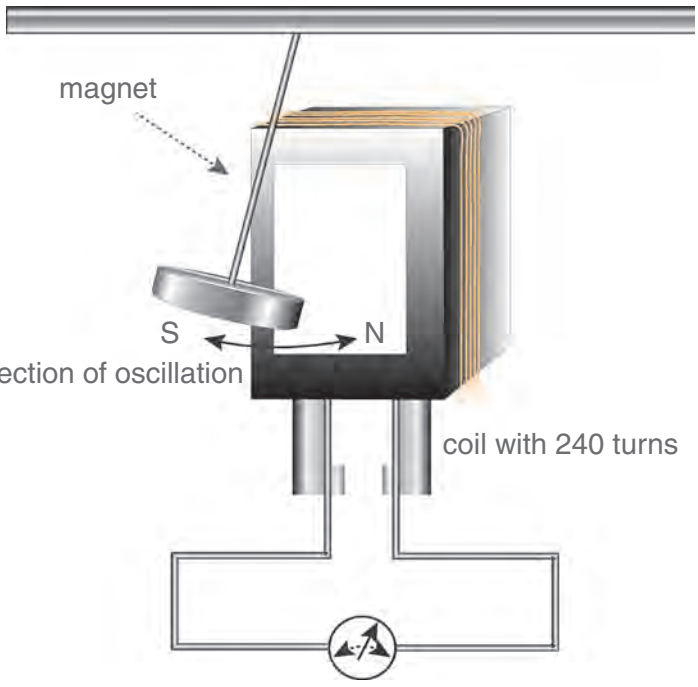
1.4 Calculate the power of the resistor.

2. Calculate the number of windings that the secondary coil of a transformer should have if the primary tension is 330 V and the secondary tension is 160 V. The primary coil has 1 050 windings.

3. Calculate the magnitude of the tension to be applied for the primary coil if the windings are in a ratio of 10:200 and the output tension is 230 V.

4.1 State Faraday's law in words.

The following diagram represents a simple pendulum with a magnet as a bob.
The magnet swings with a small amplitude in and out of a coil that consists of 240 turns of insulated wire.



4.2 Draw a sketch graph of the induced emf versus time.

4.3 The frequency of the oscillations is now increased. Name two effects that this will have on the induced emf.

_____

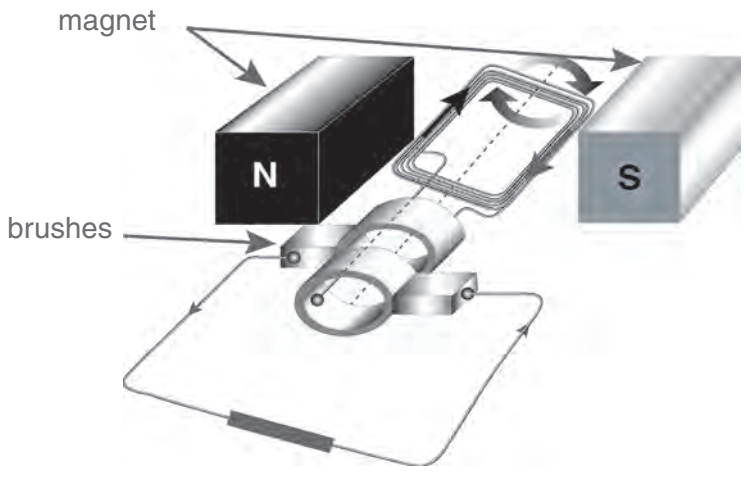
_____

4.4 Explain the answer you gave for Question 4.3.

_____

_____

5 The diagram below represents a basic electric generator. The coil is mechanically rotated clockwise so the coil moves upwards close to the north pole, and downwards close to the south pole.



5.1 Is this a DC or an AC generator? Give a reason for your answer.

5.2 Is the induced potential difference in the coil at this moment increasing or decreasing? Explain your answer, referring to the change in magnetic flux in the coil as it rotates from the horizontal to the vertical position.

5.3 Name ONE change that can be made to the above generator in order to increase the output voltage.

6 The simplified sketch below shows the working principles of an alternating current generator: