Name of the Student:_____

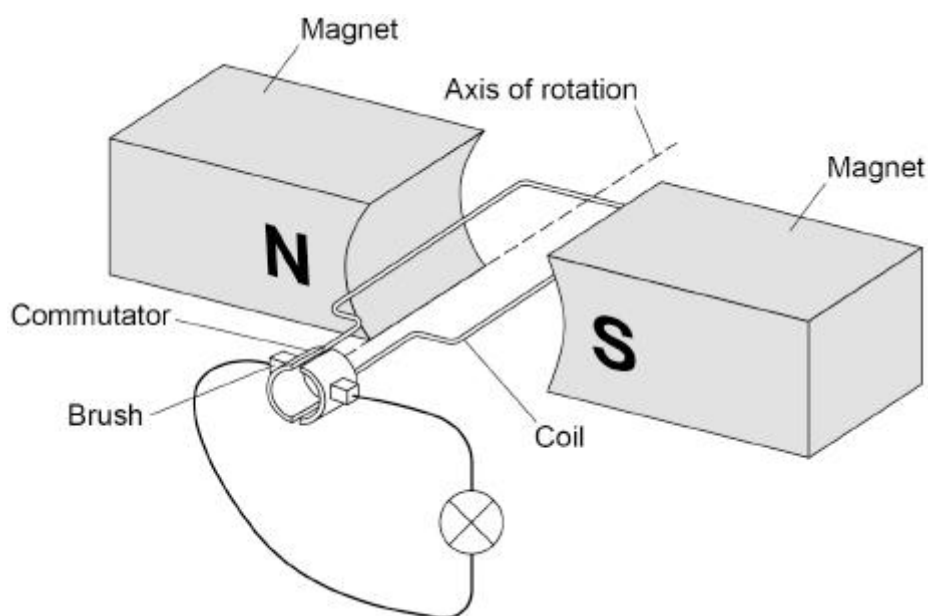**Max. Marks : 23 Marks**   **Time : 23 Minutes**

Q1.

A dynamo is used to generate an electric current.

Figure 1 shows the inside parts of the dynamo connected to a lamp.

Figure 1

(a)   The coil is rotated.

Explain why a direct current is induced in the coil.

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_____

_____

_____

(5)

(b)   Sketch a graph on **Figure 2** to show how the potential difference generated across the lamp varies for **two** complete revolutions of the dynamo coil.

Figure 2

(1)

(c)   The lamp is disconnected from the dynamo.

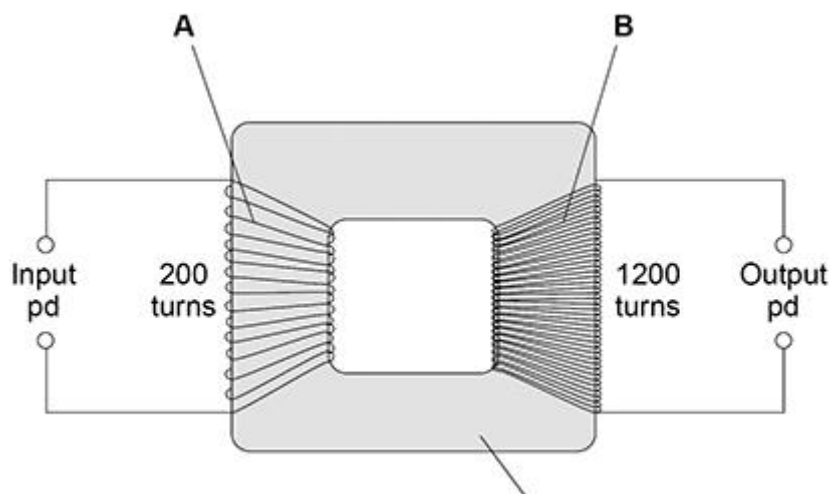Explain why the dynamo becomes much easier to turn.

_____

_____

_____

_____

_____

_____

(3)
(Total 9 marks)

Q2.

The National Grid uses transformers to change potential difference (pd).

Figure 1 shows a transformer.

Figure 1

(a) Identify the parts of the transformer labelled in **Figure 1**.

A _____

B _____

C _____

(2)

(b) There is an alternating input pd of 230 V.

Determine the output pd.

Use the Physics Equations Sheet.

_____
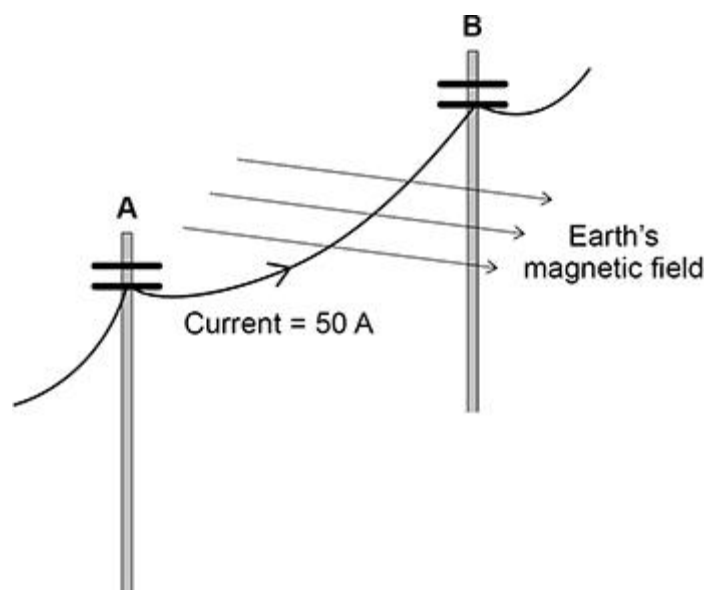
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Output pd = _____ V

(3)

(c) The input pd causes an alternating current.

Explain why there is an alternating current in the output when the transformer is connected to a circuit.

_____

_____

_____

_____

_____

_____

Figure 2 shows a large cable supported by two wooden poles. The cable is connected to an electricity supply.

Figure 2

(d)   There is a force on the cable due to the Earth's magnetic field when the current is in the direction **A** to **B**.

What is the direction of this force?

Tick (✓) **one** box.

Down   ☐

Left   ☐

Right   ☐

Up   ☐

(e)   The cable experiences a force of 0.045 N due to the Earth's magnetic field.

magnetic flux density = 60 µT

current = 50 A

Calculate the length of the cable between **A** and **B**.

Use the Physics Equations Sheet.

_____

_____

_____

_____

_____

_____

_____

_____

Length = _____ m

(4)

(f)   State **one** assumption you made in your calculation.

_____

(1)
(Total 14 marks)