Sadiq Public School

Do the right, fear no man

Subject: Physics **Class: S3** **Day: saturday (16/11/2024)**

Lesson: **Chapter no. 15 (Textbook Page # 131 to 132)**

Inquiry: **What is the principle of transformer ?**

Information: **Transformer**

A transformer is an electrical device that transfers alternating current (AC) electricity from one circuit to another, while changing the voltage:

How it works

The transformer works on the principle of [Faraday's law](#) of electromagnetic induction and mutual induction.

There are usually two coils – primary coil and secondary coil – on the transformer core. The core laminations are joined in the form of strips. The two coils have high mutual inductance. When an alternating current passes through the primary coil, it creates a varying magnetic flux. As per Faraday's law of electromagnetic induction, this change in magnetic flux induces an EMF (electromotive force) in the secondary coil, which is linked to the core having a primary coil. This is mutual induction.

- **A transformer has two coils that are magnetically linked. An AC current in the primary coil creates a changing magnetic field that induces a current in the secondary coil. The ratio of turns of wire in the two coils determines the voltage of the secondary coil.**

Commonly used transformer types, depending on the voltage, are classified as follows:

- Step-up Transformer: **They are used between the power generator and the power grid. The secondary output voltage is higher than the input voltage.**
- Step-down Transformer: **These transformers are used to convert high-voltage primary supply to low-voltage secondary output.**

$$V_s/V_p = N_s/N_p$$
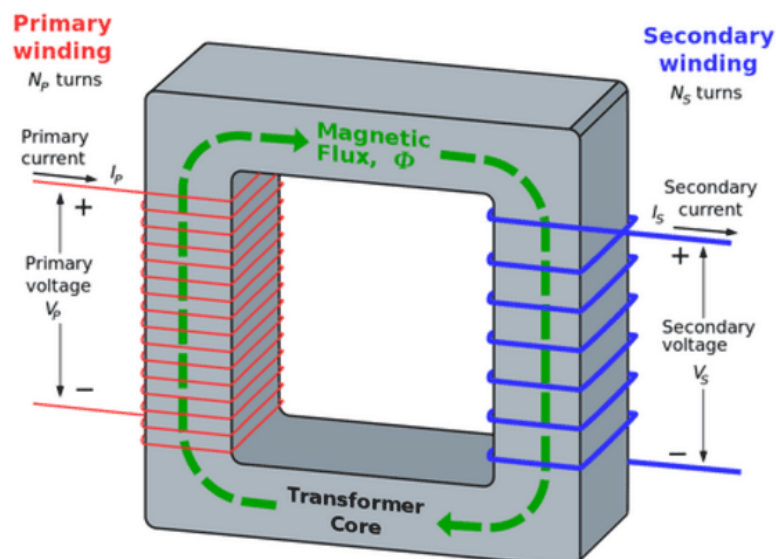
- **The** transformer**, in a simple way, can be described as a device that steps up or steps down voltage. In a step-up transformer, the output voltage is increased, and in a step-down transformer, the output voltage is decreased. The step-up transformer will decrease the output current, and the step-down transformer will increase the output current to keep the input and output power of the system equal.**

Synthesising: Q-1 What is transformer?

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Practicing: **Dear students please practice yourself to answer the following question and please ask for help from your concerned teacher via email if you find any difficulty while answering this practice question. Please keep in mind you need to look into your textbook from page # 128 to 130 before practicing the following question.**

Q-1 Explain the working of a transformer in connection with mutual induction?

Q-2 Solve example 15.1?

Feedback: **Dear students please ask questions from your concerned teacher via email as mentioned below and you will be replied ASAP.**

Class	Teachers' Names	Teachers' Abbreviations	Teachers' Email Addresses	Instructions
S3A	Zain ul Abideen	ZA	**zain.abddien2301@gmail.com**	S3A students will send their home assignments to (ZA) for checking and getting feedback.
S3B	Hafiz Mauz	HM	**h.maaz1990@gmail.com**	S3B students will send their home assignments to (HM) for checking and getting feedback.
S3C	Rao Ali	RAA	**raoaliayub_RAA_sadiq@protonmail.com**	S3C students will send their home assignments to (RAA) for checking and getting feedback.
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