

Physics - 12th Class Physics Chapter 4 Short Questions Preparation

Q1. Is it possible to change both the area of the loop and magnetic field passing through the loop and still have no induced emf in the loop? Explain briefly.

Ans 1: Yes, if the plane of the loop is kept parallel to the direction of the magnetic field, magnetic flux through the coil will be zero, no emf will be induced in the loop either by changing its area or by changing the magnetic field.

Q2. Define electromagnetic induction.

Ans 1: When a conductor is moved through a magnetic field, the electric current flows through the circuit. The emf produced in the conductor is called induced emf, and the current generated is called induced current. This phenomenon is known as electromagnetic induction.

Q3. Can a step-up transformer increase the power level?

Ans 1: No, a step-up transformer cannot increase the power level. In an actual transformer, due to dissipation of energy in the coil, the output power is always less than input power. Therefore, a step-up transformer cannot increase the power level.

Q4. When the primary of a transformer is connected to A.C. mains, the current is very small if the secondary circuit is open. Explain.

Ans 1: If the secondary circuit is open, then output power will be zero. Because output power is always slightly smaller than the input power, therefore a very small value of current is being drawn by a primary coil of transformer from AC units.

Q5. A glass rod of length L is moving perpendicular to the applied magnetic field P with velocity v . Explain briefly about the induced emf in it.

Ans 1: Induced emf is zero. As a glass rod is an insulator and there are no free electrons to be shifted from one extreme to the other. Therefore, there will be no effect of a perpendicular magnetic field. The induced emf is only produced by moving a conductor across the magnetic field.

Q6. In a transformer, there is no transfer of charge from the primary to the secondary. How is then the power transferred?

Ans 1: The power will be transferred because the two coils of the transformer are magnetically linked, i.e., the change of flux through one coil is linked with the other coil.

Q7. What changes are required to turn a D.C. motor into a D.C. generator?

Ans 1:

1. In order to convert to convert DC motor into SC generator,the magnetic field must be supplied by the permanent magnet and not by electromagnet.
2. An arrangement to rotate the coil armature should be provided and battery must be removed.

Q8. Define mutual induction.

Ans 1: The phenomena in which the changing current in one coil induces an emf in another coil is called the mutual induction.

Q9. What is back motor effect in generators?

Ans 1: Back motor effect is the opposing torque produced due to the induced emf in the coil. When coil rotated a current is drawn through the coil. The magnetic field exerts two equal and opposite forces on left and right side of the current carrying coil, These forces are such that they produce a counter torque that oppose the rotational motion of the coil. This effect is known as back motor effect in generators.

Q10. How the power is lost due to eddy current in a transformer and how this loss can be minimized?

Ans 1: The induced currents that are set up in the core of transformer in the direction perpendicular to the flux are known as eddy currents, It results in power dissipation and heating of the coral material. The insulation between lamination sheets should be perfect so as to stop the flow of eddy currents.
