1. In order to attract the magnet toward the copper coil, what is the direction which a current should be flowing in the coil?

Magnet

X

O

thread

copper coil

Y

**N S**

**A** X to Y

**B** Y to X

**C** Both X to Y or Y to X

**D** None of the above (Not possible to attract)

2. Thrust a magnet into a coil of wire (which forms a closed circuit) and the coil

**A** becomes an electromagnet.

**B** has a current in it.

**C**  both of these

**D** neither of these

3. When a magnet is thrust into a coil of wire (which forms a closed circuit), the coil tends to

**A**. attract the magnet as it enters.

**B**  repel the magnet as it enters.

**C**  both of these

**D**  neither of these

4. When a magnet is falling through a coil (which forms a closed circuit), the coil tends to

**A** attract the magnet as it leaves.

**B**  repel the magnet as it leaves

**C** both of these

**D**  neither of these

5. A coil is held stationary. Along its axis, a short magnet is moved along X to Y at a **constant** speed v. Which graph best represents how the induced e.m.f (ε) in the coil varies with time (t)?

v

Y

X

ε

t

**C**

ε

t

**D**

ε

t

**A**

ε

t

**B**

6 The magnet is held stationary. Along its axis, a short coil is moved along Y to X at a **constant** speed v. Which graph best represents how the induced e.m.f (ε) in the coil varies with time (t)?

v

Y

X

ε

t

**C**

ε

t

**D**

ε

t

**A**

ε

t

**B**

7 A coil is held stationary. Along its axis, a short magnet is moved along X to Y at an increasing speed v (example like a falling magnet under gravity). Which graph best represents how the induced e.m.f (ε) in the coil varies with time (t)?

a

Increasing speed v

Y

X

ε

t

**C**

ε

t

**D**

ε

t

**A**

ε

t

**B**

8 A short magnet is moved from X to Y along the axis of a stationary long copper coil. The magnet is moved with **constant** speed. Which graph best represents how the induced e.m.f (ε) in the coil varies with time (t).

Magnet

copper coil

**N S**

constant speed

X

Y

ε

t

**A**

ε

t

**B**

ε

t

**C**

ε

t

**D**

9 A short magnet is moved from X to Y along the axis of a stationary long copper coil. The magnet is moved with **decreasing** speed (example of tossing up a magnet into the coil). Which graph best represents how the induced e.m.f (ε) in the coil varies with time (t).

Magnet

copper coil

**N S**

Decreasing speed

X

Y

ε

t

**A**

ε

t

**B**

ε

t

**C**

ε

t

**D**

10 A short magnet is moved from X to Y along the axis of a long copper coil. The magnet is moved with **increasing** speed (example, falling magnet under gravity). Which graph best represents how the induced e.m.f (ε) in the coil varies with time (t).

Magnet

copper coil

**N S**

increasing speed

Y

X

ε

t

**D**

ε

t

**A**

ε

t

**B**

ε

t

**C**

11. A coil is placed in a region of magnetic field which is directing into the plane of the paper (example a falling magnet with North pole pointing downward). The field is increasing in magnitude with time

Top view

The direction of the induced current in the coil as seen from the top is

**A** clockwise.

**B** anticlockwise.

**C** alternating.

**D** not applicable as there is no current.

12. A coil is placed in a region of magnetic field which is directing into the plane of the paper (example a falling magnet with North pole pointing downward when magnet is lower than coil). The field is decreasing with time.

Top view

The direction of the induced current in the coil as seen from the top is

**A** clockwise.

**B** anticlockwise.

**C** alternating.

**D** not applicable as there is no current.

13 A coil is placed in a region of magnetic field which is directing into the plane of the paper. The field is decreasing in magnitude at a constant rate with time.

Top view

The induced e.m.f in the coil is

**A** reducing at a constant rate. **B** a constant and non zero.

**C** zero. **D** increasing at a constant rate.

Explain why your reason for choice.

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14 A magnet is moved at constant speed from above a coil to below. Without rotating the magnet, it is then moved back to the top again with the same constant speed. The e.m.f (ε) induced over time (t) will be



|  |  |
| --- | --- |
| A | B |
| C | D |