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Where Minds Pollinate

**Class 9
Physics**

Chapter 8

Handwritten Notes

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2 Sep - 2025

classwork

Tuesday

Chapter # 8

Magnetism

Diamagnetic

Def:-

It creates opposing field to external magnetic field -

Cause:-

All electron's are paired, no net magnetic moment ($B=0$) -

Behavior

It is slightly repelled by external field -

Magnetism:-

No, loses magnetism after removal of external field

eg:-

Bismuth, Gold,
 H_2O , glass, copper -

Paramagnetic

Def:-

It is weakly attracted by external magnetic field - creates weak magnetic ^{Field}

Cause:-

All electron's are not paired, there is net magnetic moment - ($B \neq 0$) -

Behavior:-

It is weakly attracted by external field -

Magnetism:-

It doesn't lose all magnetism after removal of magnetic field -

eg:- lithium, Sodium, aluminium -

Ferromagnetic material:-

- **Def:-** It is strongly attracted by external magnetic field - and can retain ^{magnet}

- **Cause:-**

Many unpaired electrons; Strong net magnetic moment ($B \neq 0$)

- **Behavior:-**

It is strongly attracted when placed in external field -

- **Magnetism:-**

Yes, It can retain magnetism and can be made magnetic -

- **Example:-**

Iron, Cobalt, nickel, steel (alloy of iron) -

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Chapter # 08

"Magnetism"

Short / Question / Answers

15) Can two magnetic field lines ever intersect each other-

Ans) No, two magnetic field lines can't intersect each other - if they did, it would imply two different directions of magnetic field lines, which is not physically possible - Magnetic field lines must be continuous and must not intersect each other -

25) A freely suspended magnet always points along north-south direction, why?

Ans) A freely suspended magnet aligns north-south due to Earth's magnetic field, which exerts a force on magnets. Magnet's north pole is attracted to earth's magnetic south pole and vice versa, resulting in stable poles orientation -

3) What is a neutral zone or field free region of magnetic field?

Ans) It is an area where magnetic field is extremely weak or nearly zero - It typically occurs at the midpoint between two magnetic poles, where opposing field strengths cancel out -

4) Is there any material which does not have any magnetic behavior?

Ans) Yes, materials like wood, and plastic are non magnetic materials, they lack electron pairs, these materials don't interact with magnetic field -

5) A proton is also a charged particle and spins like electron why its effect is neglected -

Ans) Proton's magnetic effect is often neglected because its magnetic moment is much smaller than electron's, As protons

Li
are usually bonded in the nucleus where its effects are less significant than those of electron's in determining magnetic properties.

6) What is Geomagnetic reversal phenomenon? Explain.

Ans) It is a process in which Earth's magnetic North and South poles switch places over geological time scales, this phenomenon is a complete flip in planet's magnetic field orientation - it occurs irregularly after thousands to millions of years.

7) Why Earth's spin about its Geographical axis instead of its magnetic axis? Explain.

Ans) Earth's spin about its axis because its rotation axis is aligned with planet's inertial angular momentum, is a stable axis of

rotation, The magnetic axis, being influenced by complex and dynamic processes within the Earth's core, does not align with rotation axis-

8) Why the Earth's geographical and magnetic axis are not coincident-

Ans) Earth's Geographical axis and magnetic axis are not coincident because magnetic field is generated by fluid motion in Earth's core, which are not perfectly aligned with earth's axis of rotation. The magnetic poles of earth are inclined at an angle of 11.3° . This misalignment occurs due to complex and dynamic nature of Earth's internal processes.

9) Write difference between Paramagnetic and Ferro magnetic materials?

Ans)

Paramagnetic	Ferromagnetic
- It is weakly attracted by external magnetic field - - All electrons are not paired, net magnetic moment is there ($B \neq 0$) - eg: Na, Lithium	- It is strongly attracted by external magnetic field. - All electrons are not paired, net magnetic moment is there ($B \neq 0$) - eg: Iron, Cobalt -

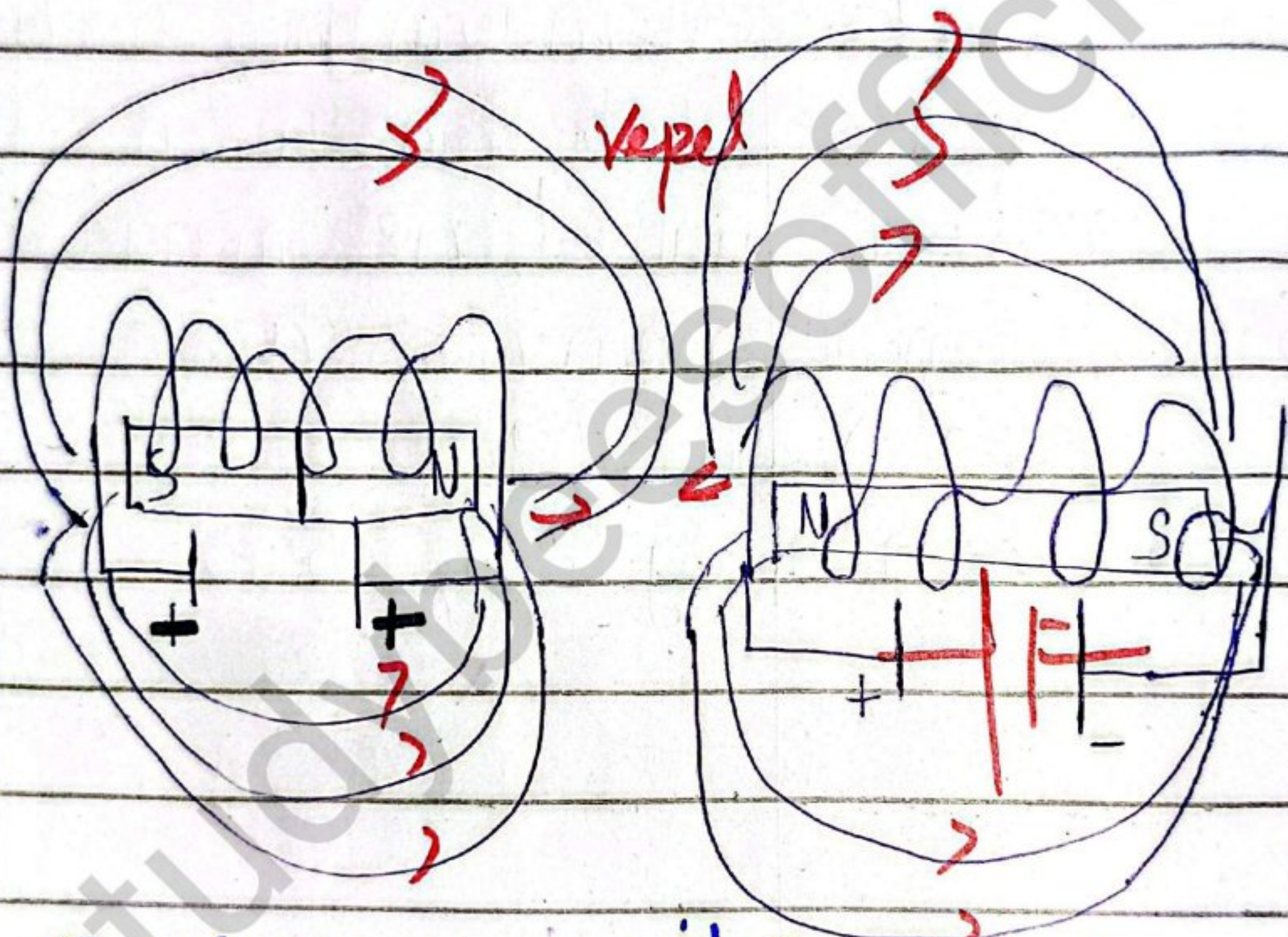
10) At what factors the strength of magnetic field depends -

Ans) The strength of electromagnet depends on number of coils and electric current flow and core material's magnetic permeability also affects the magnetic strength -

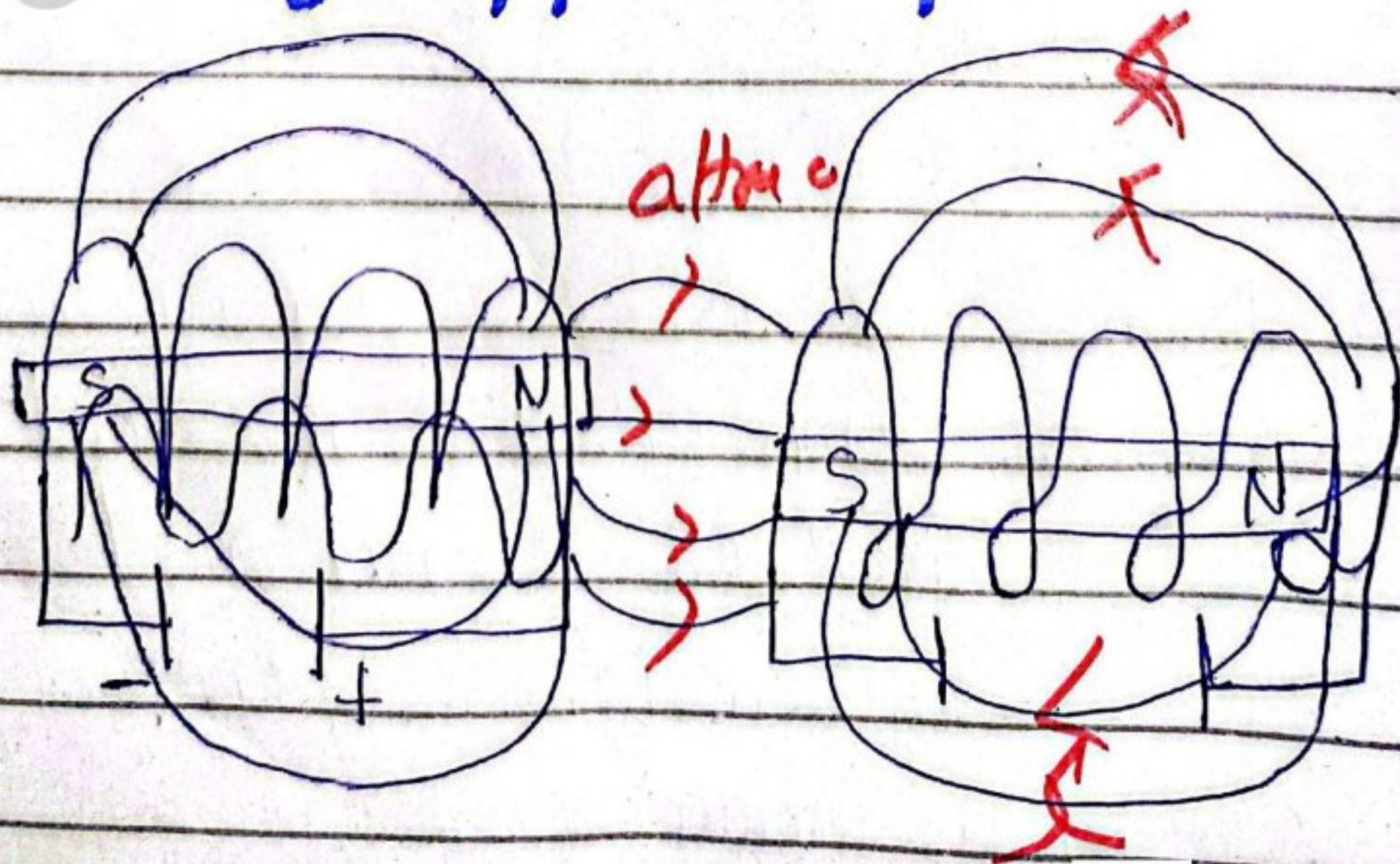
11) Draw magnetic field lines of two solenoids placed near each other—

Ans)

*Facing same poles to each other:-



Facing opposite poles:-



Numerical #1

$$B = ?$$

$$I = 1.3 \text{ A}$$

$$\mu_0 = 4\pi \times 10^{-7} \text{ N/A}^2$$

$$B = \frac{\mu_0 I}{2\pi r}$$

$$B = \frac{4\pi \times 10^{-7} \times 1.3}{2\pi \times 1 \times 10^{-1}}$$

$$B = 2.6 \times 10^{-6} \text{ Tesla}$$

Ans

04/09/21

$$\mu_0 = 4\pi \times 10^{-7} \frac{N}{A^2}$$

constant value

$$B \propto I$$

$$n = \frac{N}{l} = \frac{\text{number of turns}}{\text{length}}$$

$$= B \propto I$$

$$= B \propto \frac{I}{r}$$

$$= B \propto \frac{I}{r}$$

$$= B = \frac{\mu_0 I}{2\pi r}$$

Ampere's law

$$F = BIL$$

$$B = \frac{F}{IL}$$

$$B = \frac{N}{Am} = \text{Tesla (T)}$$

↓

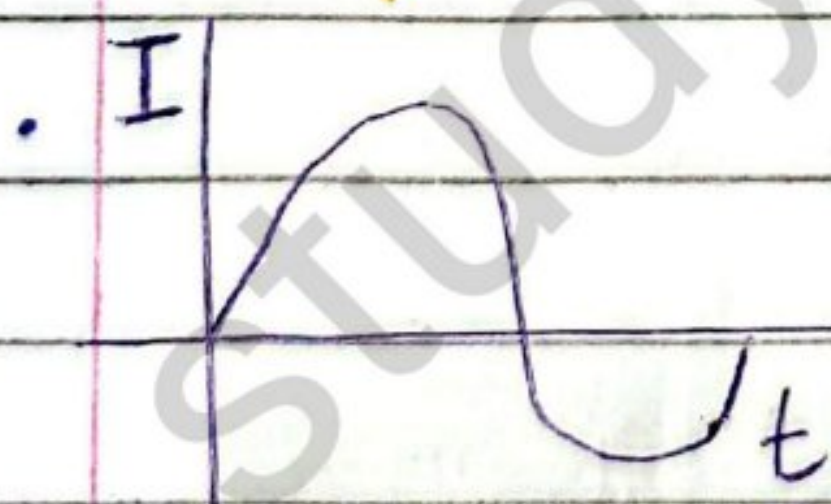
$$\frac{WB}{m^2}$$

AC (Alternating current)

- The current that changes the direction and magnitude after regular interval of time

- It's frequency is 50 Hz -

- It's sources are generators -



- It is cheap and reliable -

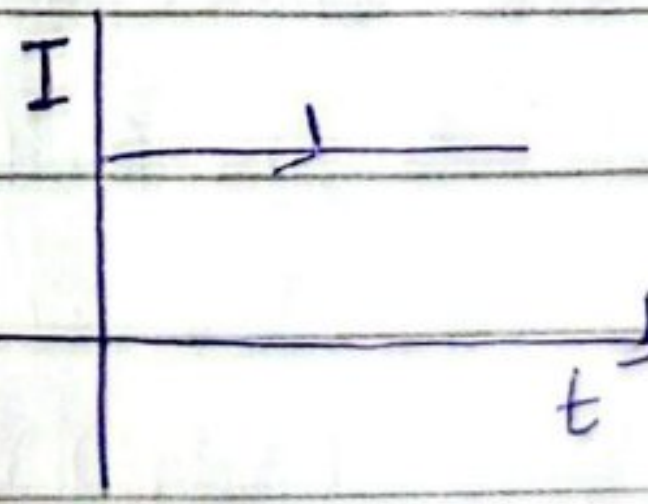
- Symbol: $\sim$

DC (Direct current)

- The current that does not change its direction is called D.C

- It's frequency is 0 Hz

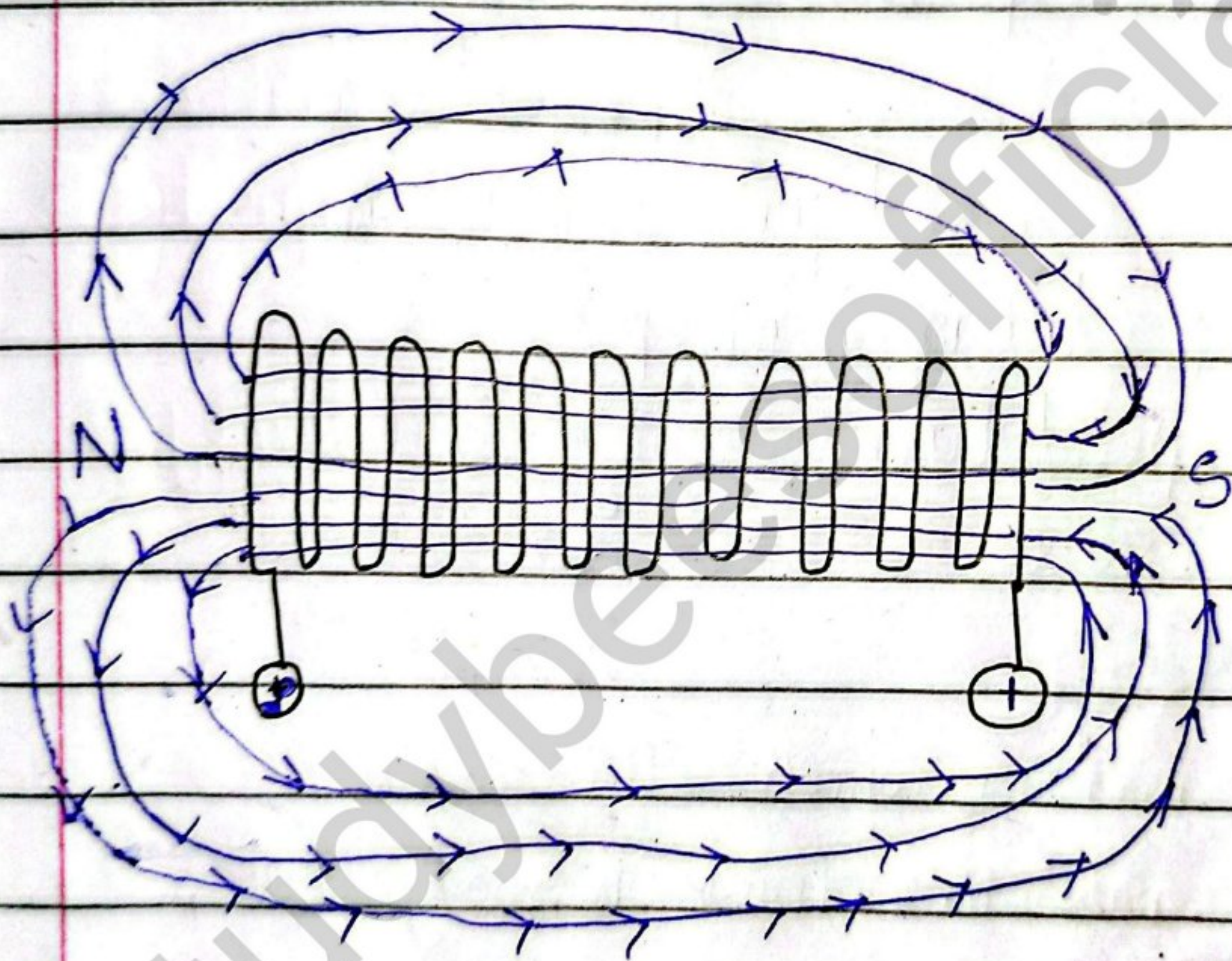
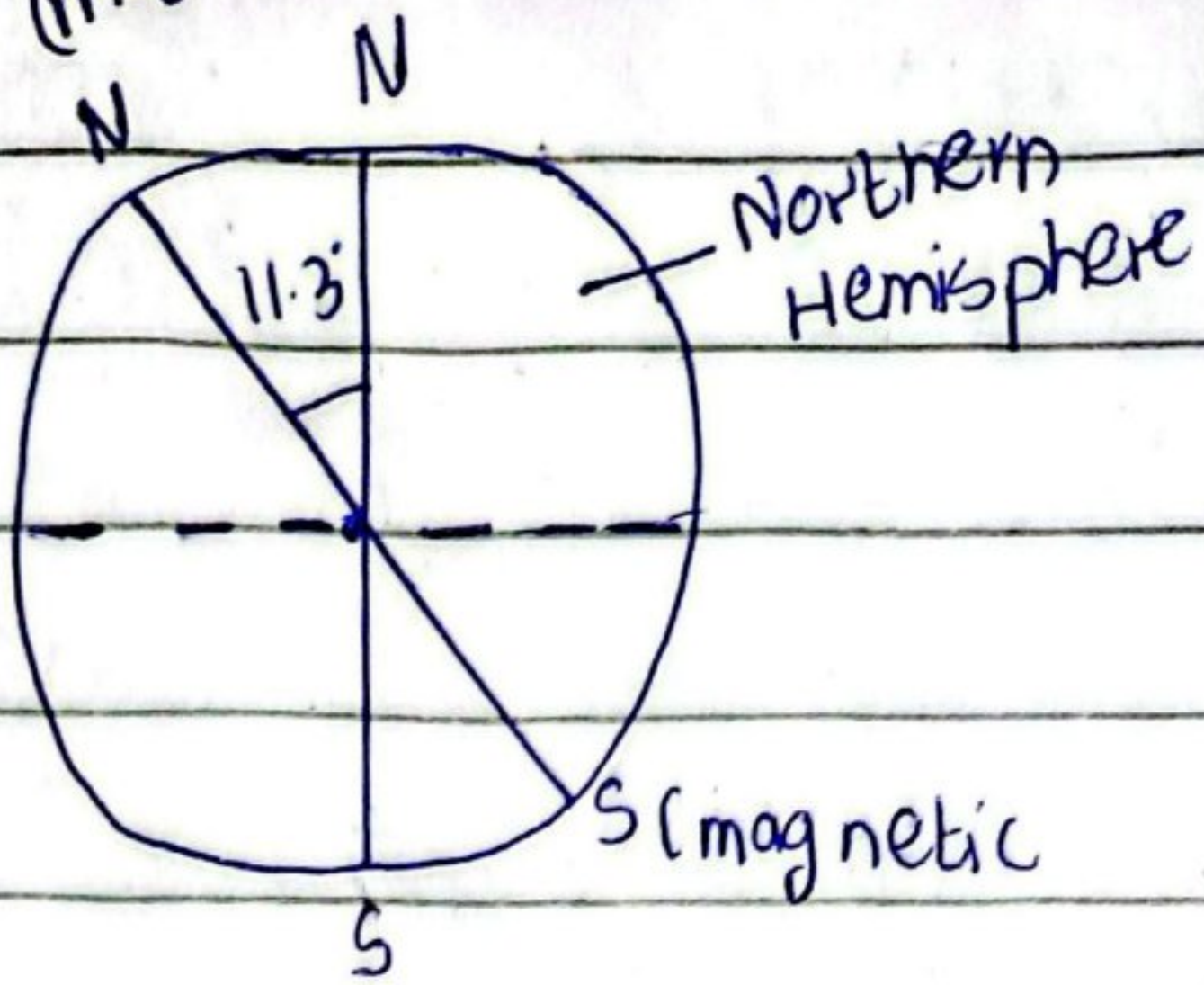
- It's sources are cells and batteries -



- Not very cheap -

- Symbol: $\frac{+}{-} | | \frac{-}{+}$

(mag)



.) It is the increase in velocity of an object-

.) Speed increases -

.) It has positive sign -

.) Body accelerates -

Bar Magnet

.) Permanently magnetized

.) Made up of hard magnetic material -

.) Polarity of poles can't be altered -

.) It doesn't lose magnetization after removal of external field -

Like Parallel Forces

The forces that are equal in magnitude and are in same direction

It is decrease in velocity of an object

Speed decreases -

It has negative sign

Body decelerates -

Solenoid

Temporarily magnetized

Made up of soft magnetic material -

Polarity of poles can be altered -

It does lose magnetization after removal of external field -

Unlike Parallel Forces

The forces that are equal in magnitude but opposite



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