

## PAPER AND PULP:

Paper: A thin sheet material produced by chemically/mechanically processing cellulose fibres derived from wood, grasses and other vegetable sources.

It is ~~used~~<sup>made</sup> by from bamboo, straw, jute, lokta, recycled waste paper, cotton, old clothes, etc.

Papers are classified as. wrapping papers, printing papers, writing papers, drawing papers, cigarette papers, tissue papers, toilet papers.

Raw Materials in Paper Making:

(i): Pulp (ii) Sizing elements (iii) Filler agents (iv): Pigments.

Wood pulp is mostly used because it is a good source of high quality cellulose fibres.

(a): Pulp:

Pulp is a soft, wet, shapeless mass of fibrous materials (cellulose) obtained from bamboo, wood and sugarcane fibres through mechanical or chemical methods.

It is important material for paper making.



Pulp is of three types:

(i): Wood pulp:

- Obtained from hardwood and softwood trees.
- Obtained by chemically / mechanically reduced wood fibres into a lignocellulosic fibrous materials.
- Wood pulp is environmental friendly.

(ii): Non-wood pulp:

- Pulp containing vegetable fibres with numerous additives
- Helps regulate physical characteristics, printability, aesthetics of the paper.
- Helps produce high quality papers.

(iii) Recycled pulp:

- One third of total raw pulp.
- Deinking process is used to separate recycled paper pulp and mixed with fresh pulp to produce different grades of papers.

(b) Sizing elements: Rosin and starch are used.

- Rosin is used for internal sizing and provides water resistance to paper.
- Starch is used for surface sizing to control absorption of printing ink.

(c): Filler agents:

These are used to enhance paper opacity, smoothness, brightness and for whitening.



(d): Pigments:

Pigments are used to provide different colours to paper.

Stages of Paper Production:

1) : Preparation of Raw Material

→ Includes debarking of wood, chipping, chip handling and storage.

(b): Preparation of Fibre suspension:

→ Fibres are separated by digesting the chips in digesters using steam.

→ Chemical pulp are made by digesting chips using Kraft and sulphite process.

→ Pulp is mixed with water to form slurry by mechanical disintegrators and fillers are added.

→ Sizing elements and colouring agents are also mixed.

(c): Bleaching:

→ Bleaching is done to remove ~~addit~~ remaining lignin.

→ It is treated with chlorinate - bleaching agents like chlorine, hypochlorite and caustic soda.

→ Pumped through a series of screens to remove <sup>dirt</sup> dust or plastics.



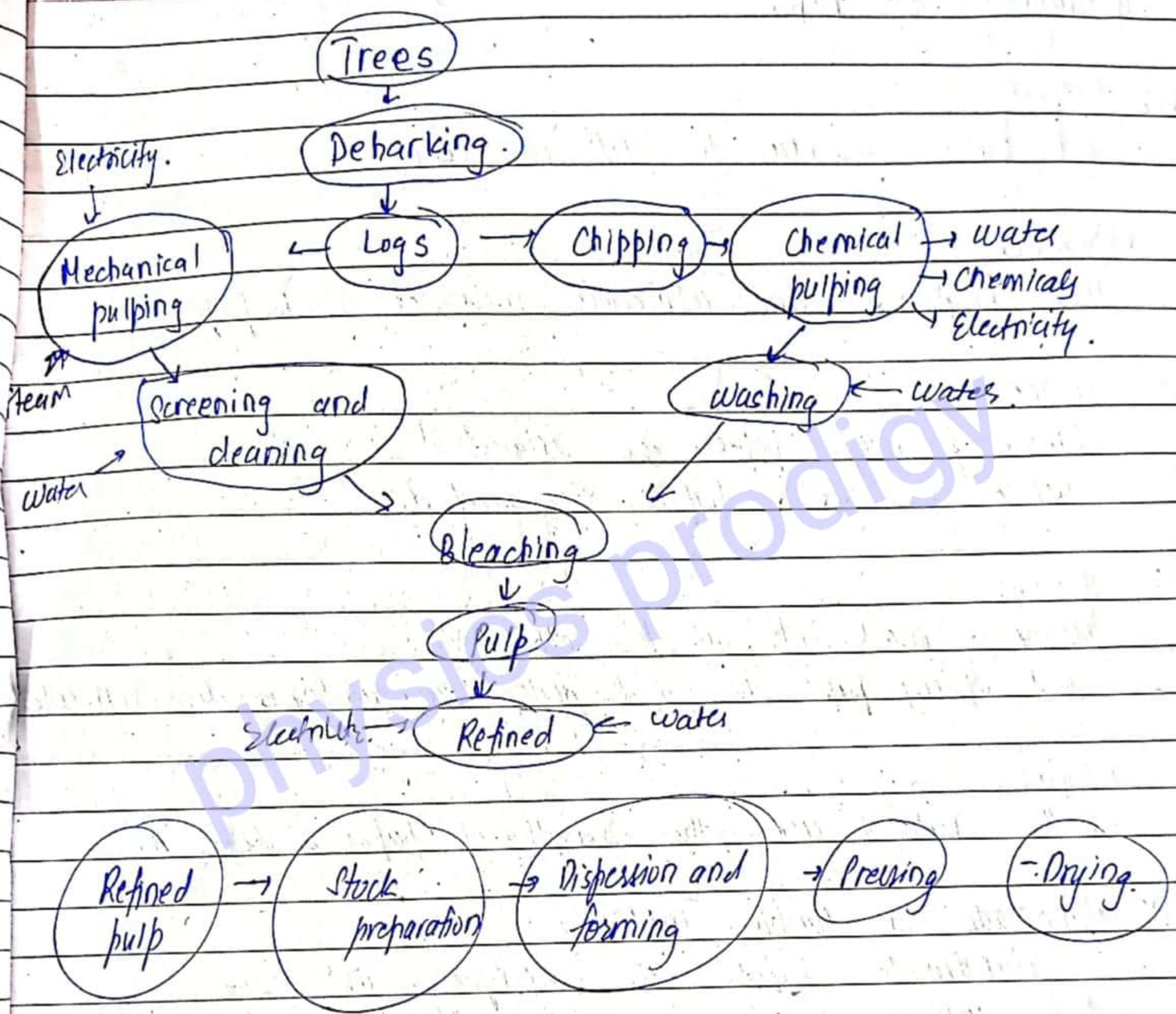


Fig: Flowsheet diagram for paper production.



## Qualities of Paper:

(i): Weight:

wt. varies according to different uses

(ii) Appearance:

More brightness and whiteness indicates good paper quality.

(iii) Surface:

Surface of rough papers are uncoated

Surface of smooth papers are coated.

(iv): Opacity:

ability to mask ink on the other side.

→ Good opacity paper is good quality and writing is done both sides.

(v): Strength:

On the basis of use, the strengths of paper are different.

(vi): Handmade or Machine made:

Handmade papers are stronger and have richer texture and of good quality.

(vii) Longevity:

The longer the cellulose chain, greater strength and durability of paper.

The shorter the cellulose chain, lesser strength and durability of paper.



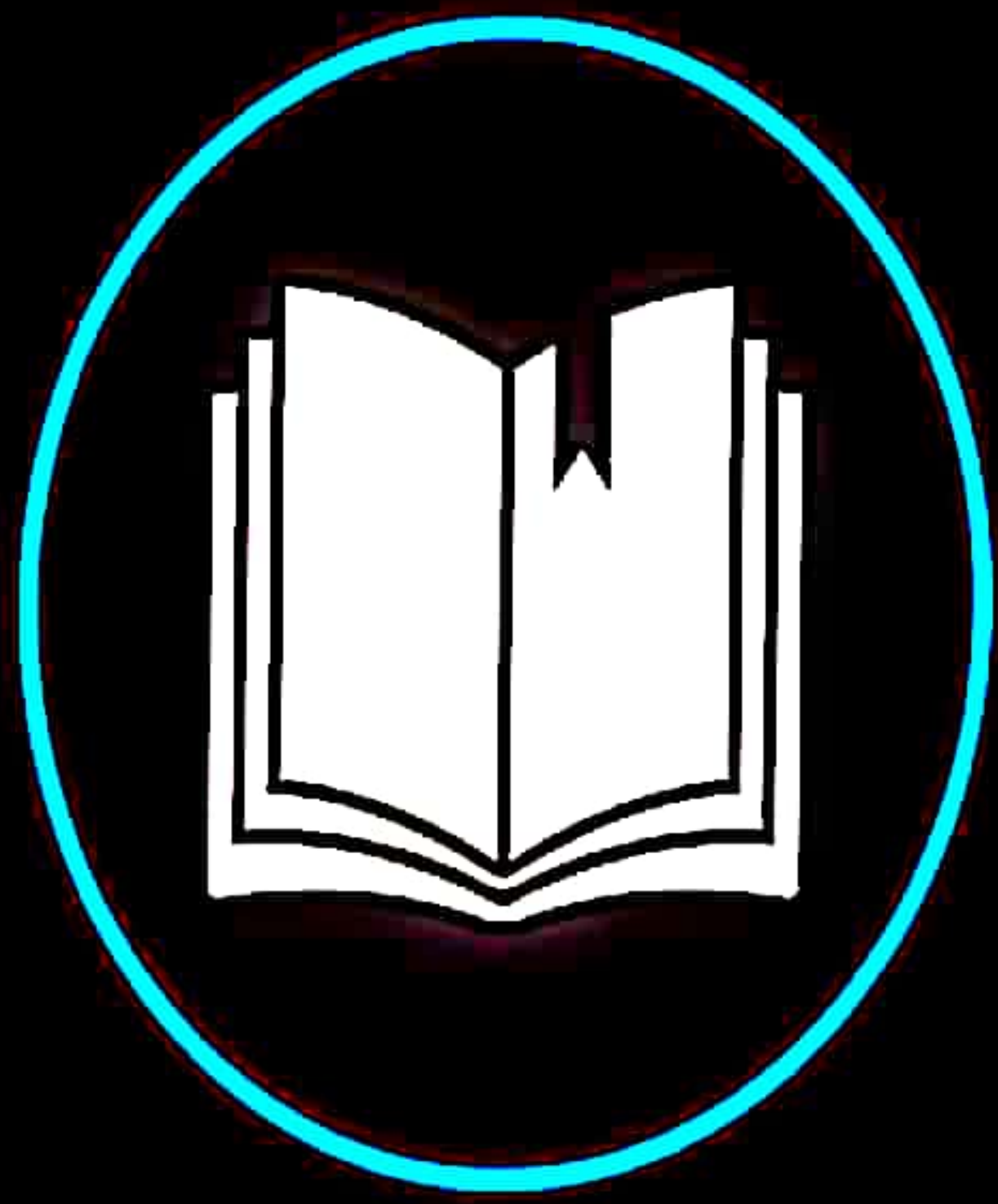
Removal of lignin leads to higher fibres - fibre bonding strength.

physics prodigy

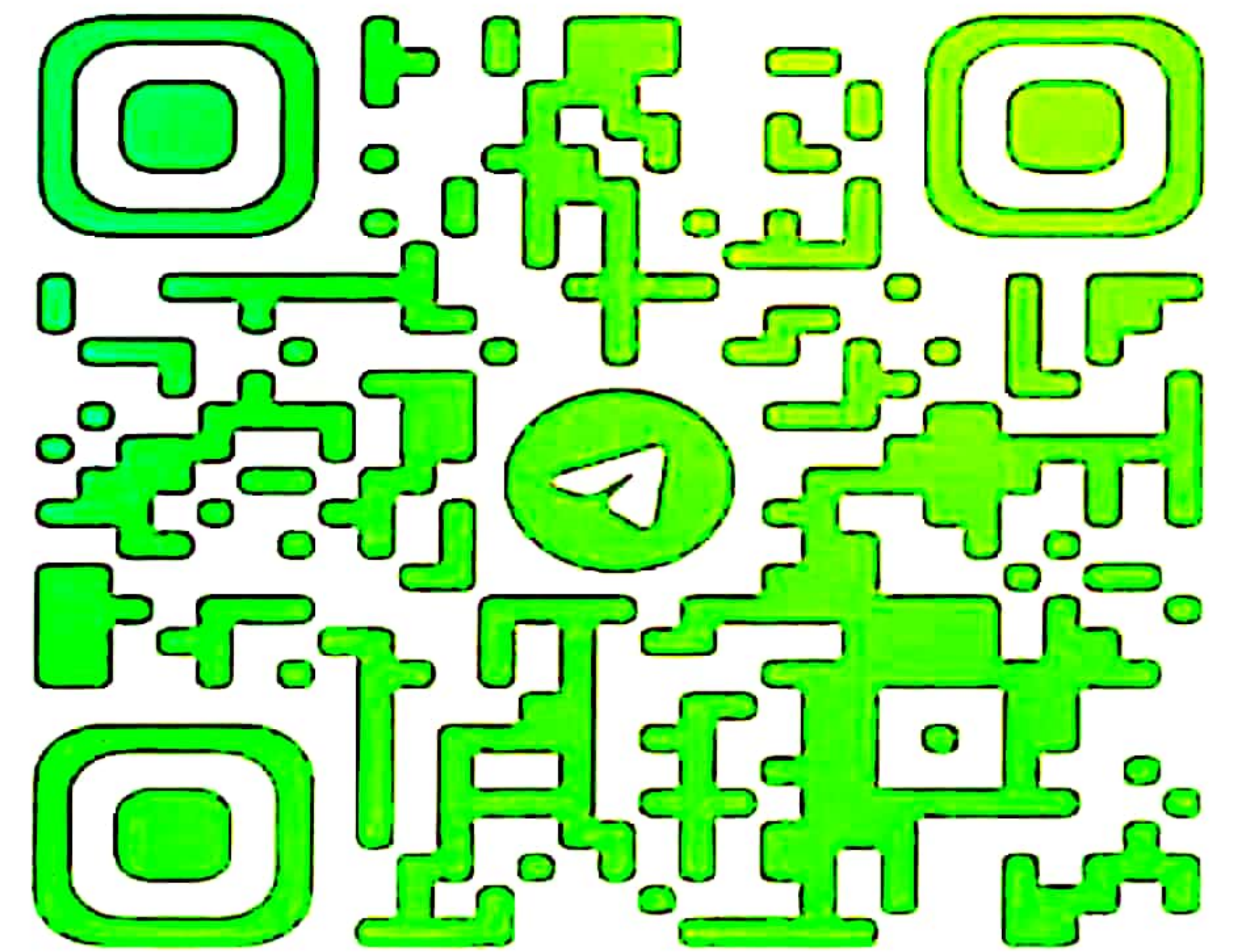


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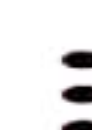
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