R. K. GROUP OF COLLEGE

BEHIND KALWAR POLICE STATION, KALWAR, JAIPUR (RAJ.)

CERTIFICATE

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Roll No.: *Exam No.:*

Institution _____

This is certified to be the bonafide work of the student in the _____

_____ *Laboratory during the academic year 20 /20*

No of practicals certified _____ *out of* _____ *in the subject of* Botany

.....
Teacher in-charge

.....
Examiner's Signature

.....
Principal

Date : .....

institution Rubber stamp

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Spotting

1. Laminar Air Flavo

- It is used for implantation of pus media in sterile (i) conditions in a laminar chamber in laminar airflow.

(ii) In this work, Laminar the hipafilter is located parallel to the workpiece to allow air flow at an angle.

(iii) Laminar flow chamber is 8 x 112 feet and contains all the necessary equipment and materials like pipettes, cutters, burners, scissors, forceps, bush, Nijrmi plaque, padiplate etc.

(iv) Ultraviolet sterilization is carried out in laminar air flow.

Types of laminar air flow -

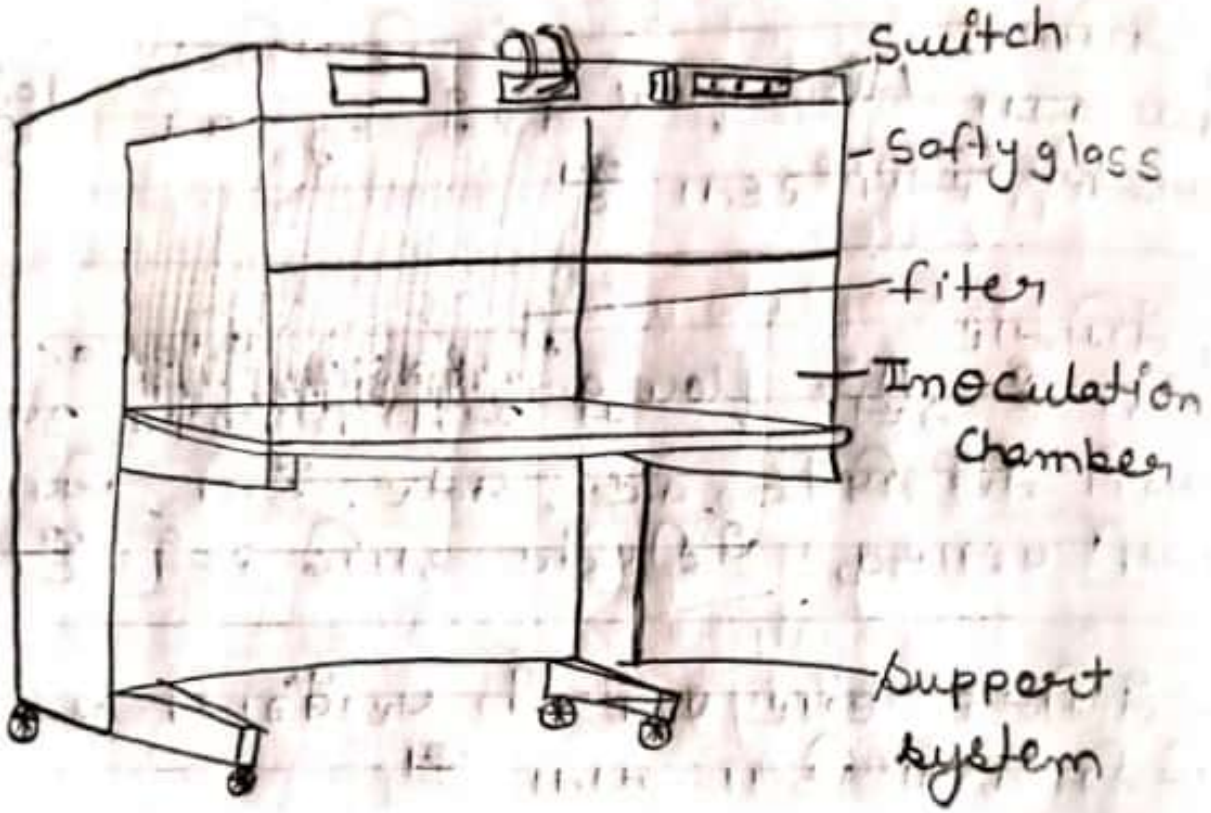
- Horizontal Laminar Air Flow -

(1) Horizontal Laminar Air Flow There are 2 types. (Horizontal Laminar Air Flow)

Method :-

First switch on the laminar air flow.

Turn on the light for about a minute before sterilization is complete.



Linear air flow

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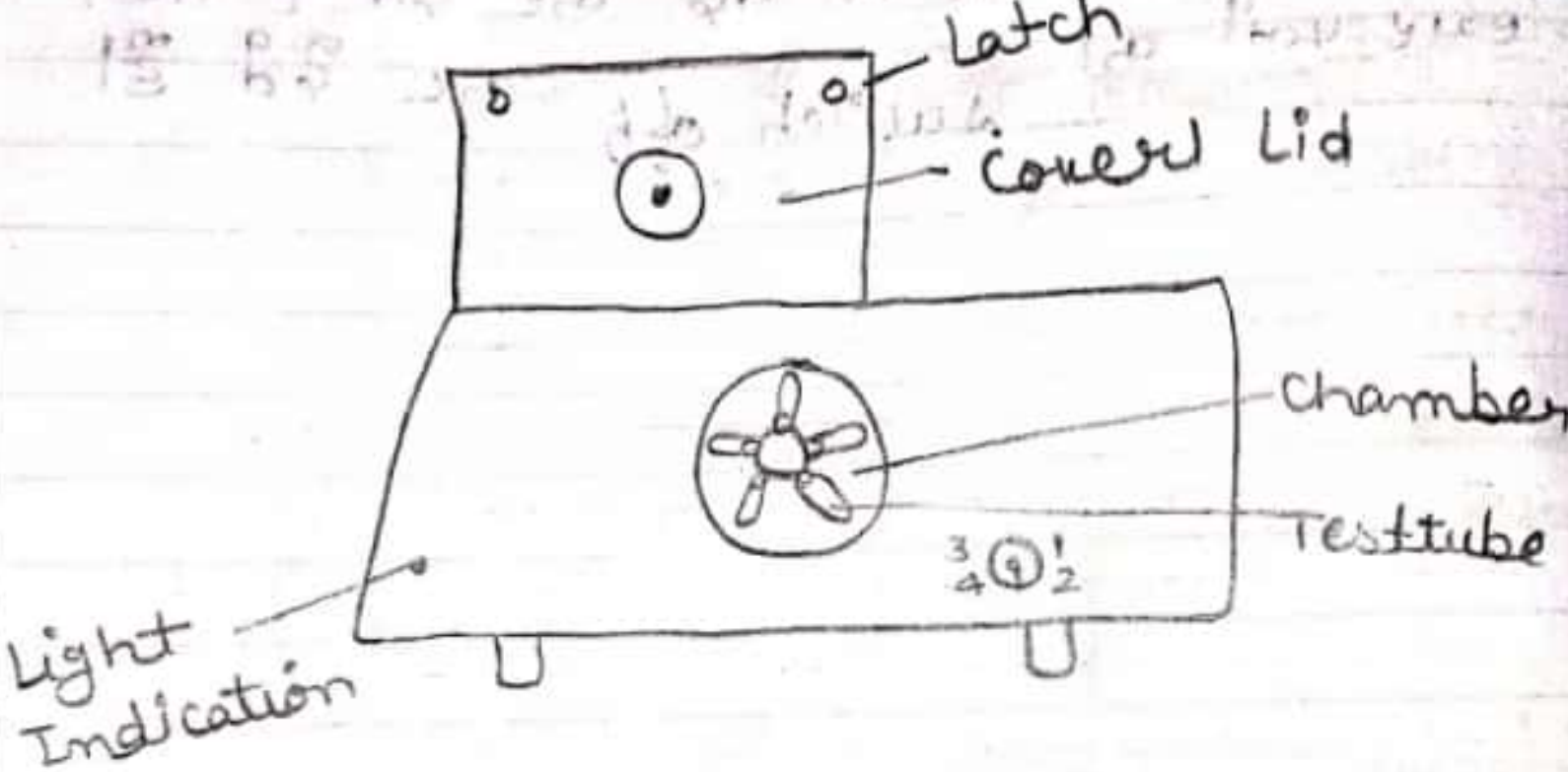
The air flow should be maintained in such a way that polluted air does not enter.

Before starting work, clean utensils, bench, hobby key and glass (iv) paper with alcohol.

(O) Burner is lit while implanting and after implanting, the burner is switched off and laminar air flow is switch off switched on.



Centrifuge

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2. Centrifuge

(1) It is a device that separates particles or substances at very high speed by centrifugal force based on their density and killing force.

A centrifuge is a metal device (ii) consisting of a stand with a wide top and metal cups in which test tubes are placed. It is thicker at the base.

(iii) The centrifuge of a car is generally of three types

(a) Low speed centrifuge - speed range = 500rpm

High Speed Sandipuse - Speed Range = 20,000rpm

(b) Alha centrifuge – speed limit = 60,000 rpm

(iv) A The kinetic energy is expressed in revolutions/minute or angular speed.

Centrifugal force = angular velocity * radius

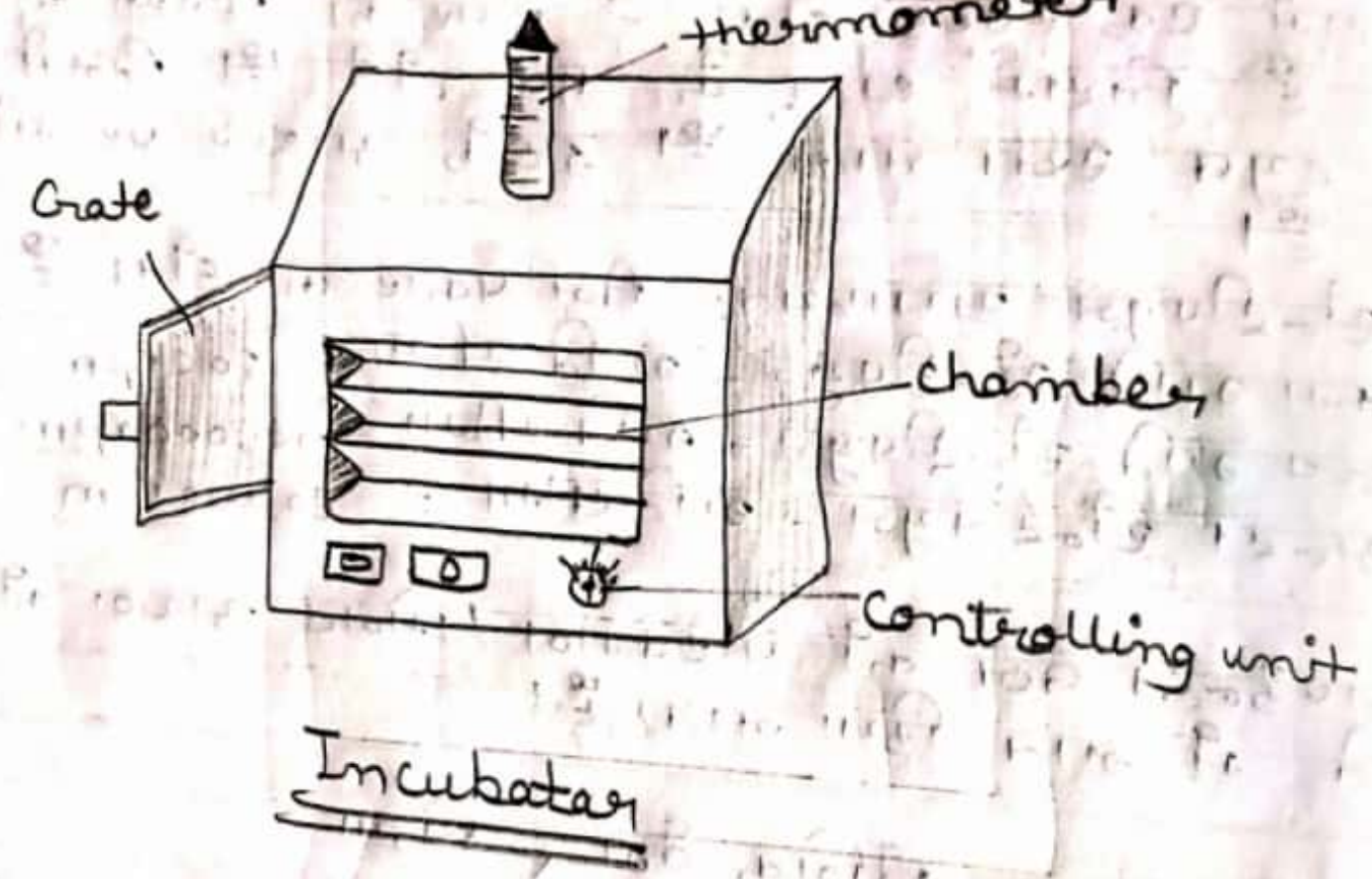
Angular velocity is expressed in revolutions per minute.

Conic velocity = $\frac{\pi}{27}$. radius | Sec.

Apkenhi force is normally a relative centrifugal

क्षेत्र गुरुत्व बल में दबाया जाता है।

Precautions should be taken to ensure that the contents of the cup are properly filled before placing them in the centrifuge.



Incubator

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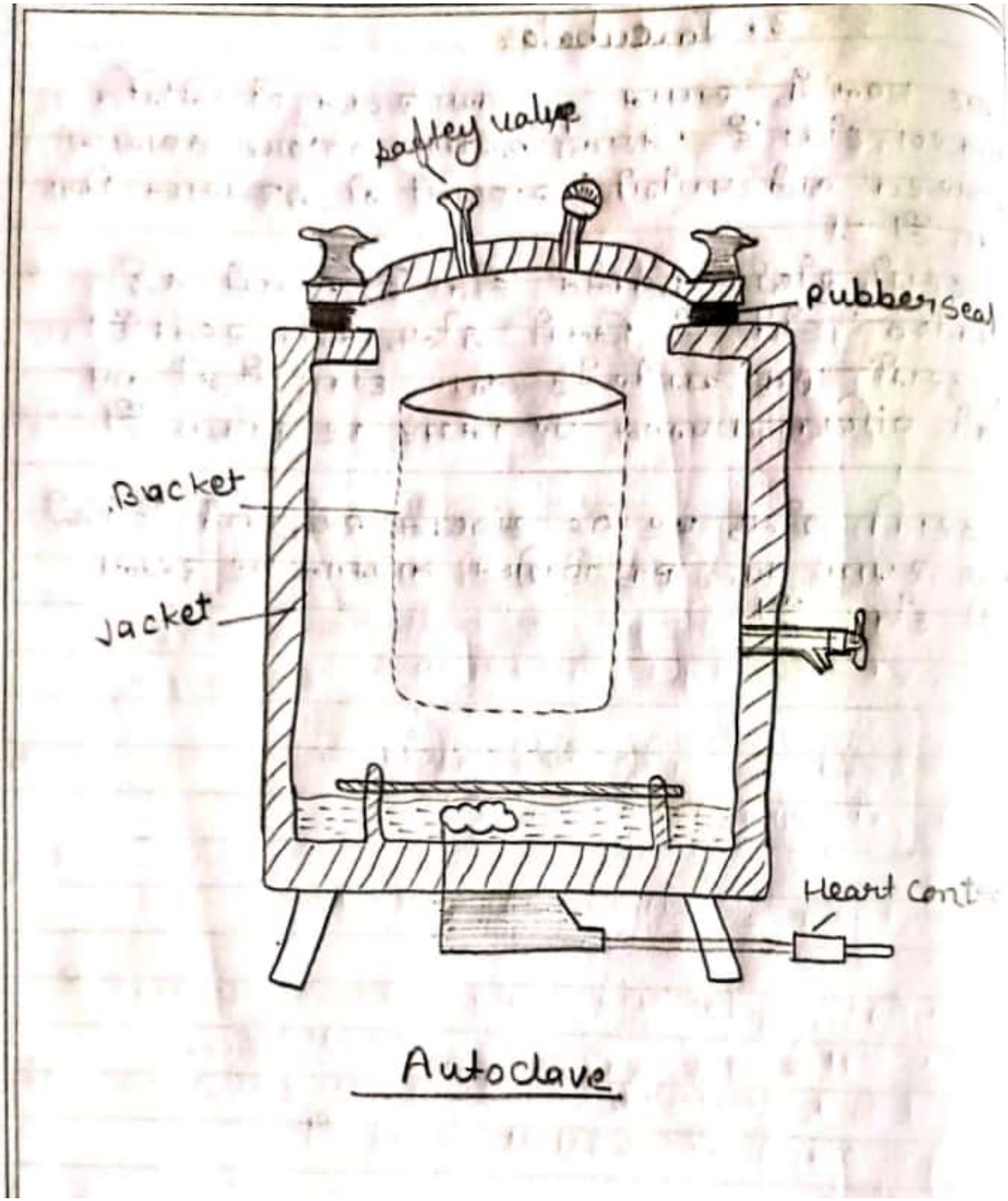
3. Incubator

(i) It is an oven-like device made of steel (1) and is used in cultures requiring specific temperatures.

It consists of a protective cabinet with several (3) compartments fitted with shelves.

It has a thermostat that can adjust the temperature to the desired temperature.

(iv) Its shelf holds cultures that are needed for specific period of time. Storage at a specific temperature



Autoclave

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4. Autoclave

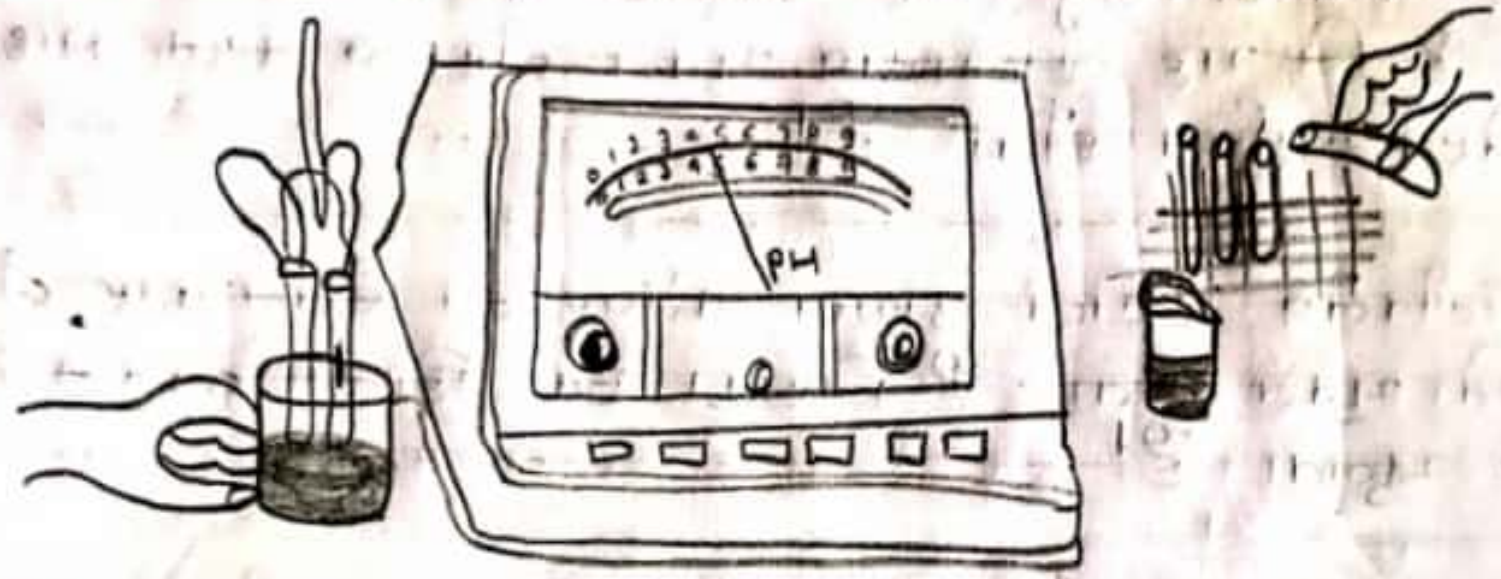
Autovalve is used for sterilization of glassware, culture mediums of various types (i), cotton, filter paper, tool box etc.

This device is considered very useful for sterilization as it is suitable for solid and liquid media containing microorganisms.

An autoclave is a cylindrical double-walled structure made of steel or copper, one side of which opens into a lid.

(ii) Pressure Gauge (15) Steam Cock is found on top of the autoclave lid to create a vacuum in the autoclave (Mid) chamber.

(0) An autoclave has a safety valve and a control valve which adjusts the pressure inside the temperature and device.



pH meter

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meter

5. PH

Sorenson used term in 1906 to explain in a simple way the code of pan-song.

The negative logarithm of the concentration of the effective ions present in any solution is called the value of .

The value is measured by a pH meter (for which the acidity and alkalinity of the pH solution is determined).

The instrument consists of two electrodes. (iv) pH dial.

(v) There is a glass electrode.

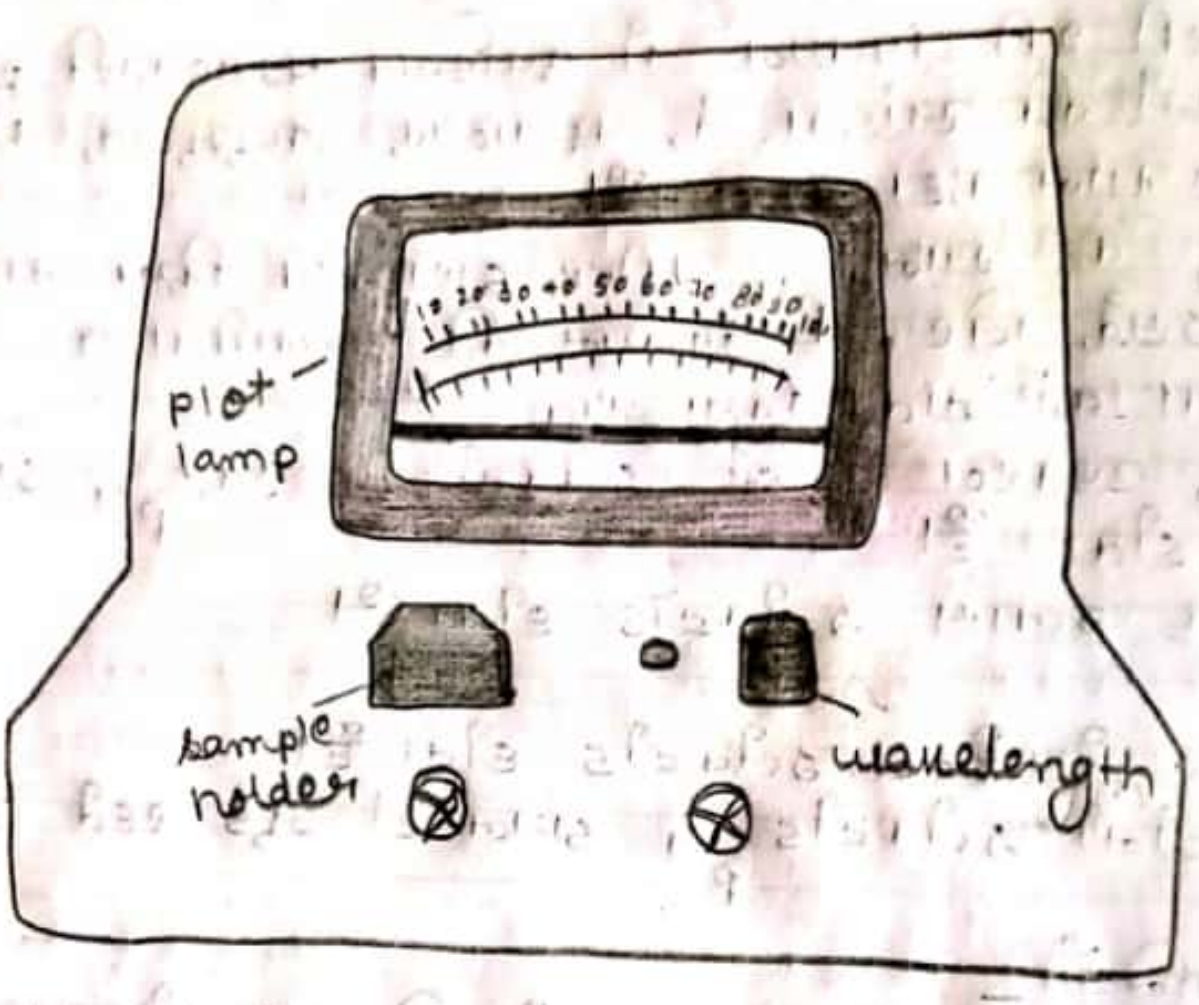
(vi) There is a reference electrode.

Both electrodes are connected to the pH dial.

Precautions -

A of fixed interval is to saturated solution replenished after an interval.

(ii) Always turn off the on button of the meter before removing the electrode from the solution.



Spectrophometer

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6. Spectrophotometer

This instrument measures the concentration of a biochemical compound or the herbivory of a bacterial population.

(i) If the optical density or (ii) radii of the substance were high

(iii) It identifies bacterial concentration which can be measured with the help of spectrophotometer.

(iv) Colorimeter/Spectrophotometer has mainly three parts

~~ε~~ - 11 (a) Light strip

Suitable selector unit to provide light waves of desired wavelength.

(7) The wavelength of colorimetry is higher.

(vi) Spectrometers have a short range of fixed wavelengths.

(C) The instrument for measuring the intensity of light passing through - made of glass or a suitable sample air consists of a slit size of air to be placed on it.

PAGE NO. ..... Exercise - 1 DATE .....

Origin - To study the effect of temperature on permeability of plasma membrane.

Equipment:- Beetroot, test tube, test tube stand, distilled water, spirit lamp, apparatus or spectrophotometer.

plasma membrane: This is the outer layer of protoplasm that controls the movement of substances in the heart. It affects both movement. inward and outward

principle Diffusion of solvent molecules in a solution through a solution with a higher concentration is called osmosis.

When a small square piece of beetroot is placed in distilled water, the purple colour present in the beetroot does not diffuse out of it.

If the outer water becomes coloured, it indicates loss of permeability of the millipores of the beet (ii).

Process :-

ii) Take the beetroot and remove its cylindrical parts with the help of cork borer. Take the fittest hot-2 in jujube and take the nuts with a sharp knife.

PAGE N

Wash all the beetroot pieces thoroughly in water
(1ii) until – until the
It has a purple pigment – anthocyanin in it stops
diffusing out from its cut surface.
Arrange 6 wide-mouthed test tubes in a
test tube stand (iii).
(10) all the test tubes at 0°C, 10°C, 50°C,
70°C and put 1 duck of beetroot each
with the help of forceps.
Put an ice cube in the test tube and set its
temperature (7)
vi) Test tubes two to six have a temperature of 10.0
test tubes keep all
at 1, 30°C and 50%
70% gloc for 15 minutes
(vii) ૧૬૯ ૬૮ ૬૧

Results and Conclusion :-

1i) The reddish
purple anthocyanin pigment present in beetroot diffuses after 15
minutes at temperatures like 10°C - 100°C.
(ii) The permeability of the heart mills
of beetroot is lost in the test tube in which the water
becomes coloured.

Precautions -

(i) Beetroot pieces should be washed
thoroughly before use.
With the help of tweezers, take only ii of the
beetroot pieces.

Exercise - 2

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DATE .....

Udyog

- To determine the osmotic potential of vacuolar sap by plasmolytic method.

Requirements: Leaves of Rhododendron discolor, watch glass, measuring cylinder, sucrose or sugar, distilled water, microscope.

principle — protoplasm separates by coagulating due to exudation in the cell wall.

In lysis, the

(ii) Plasmolysis begins when the colloid is placed in a solution or sugar solution that is more concentrated than the cell sap.

pressure called the — develops g soon stops a — osmotic pressure (iiiii) of the solution.

It is directly proportional to the density of the solution. (iv) Higher the density of the solution, higher is the osmotic pressure.

However, another term, osmotic potential, is also used instead of osmotic pressure.

(v)

Pure water has an osmotic potential of zero (vi) because it contains no ions.

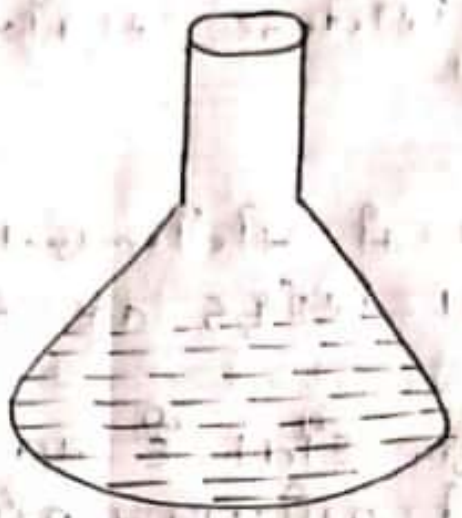
solutes or

vii) If a solution of 1 gm mass is dissolved in water to prepare a solution of 1000 ml

gm

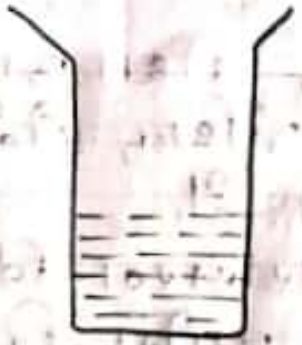
(c) A solution of one molar mass of immense lysoma milli sucrose (342 - 309 1000 ml) is separated from - 256 ml of water by sieving.

Preparation of solution

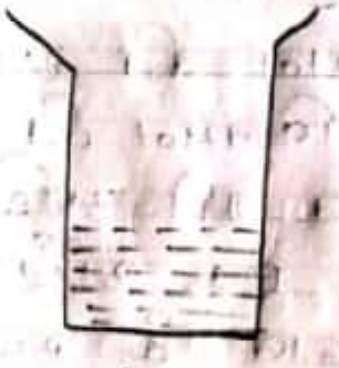


1 M solution
(Dissolve 342.3gm)
Sugar in one Litre

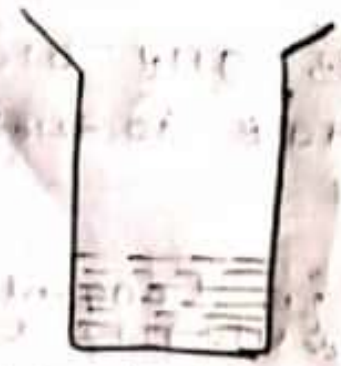
100ml solution of 1M
+ 100ml DW
(0.5M)



10 ml - 0.5 M
+ 10ml DW
(0.25M)



10ml - 0.25 M
+ 10ml DW
0.125M



10 ml - 0.125 M
+ 10ml DW
0.0625 M

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The osmotic potential of a cavity is represented by (psi-animal). of a cavity The osmotic potential can be determined by the following formula

= m s of (osmotic solution) where $\frac{RT}{V}$

m =

The value of water potential is equal to the osmotic solution potential of the cell.

4 = 4P is the potential here ground to the value of which is potential. the pressure

$\Psi = \Psi s$

Preparation of a mild solution of sucrose :—

(i) is the molecular weight of sucrose.

(ii) Its litre millilitre $\frac{342}{1}$ solution in bulk contains 1 gm of the weight sub.

solution

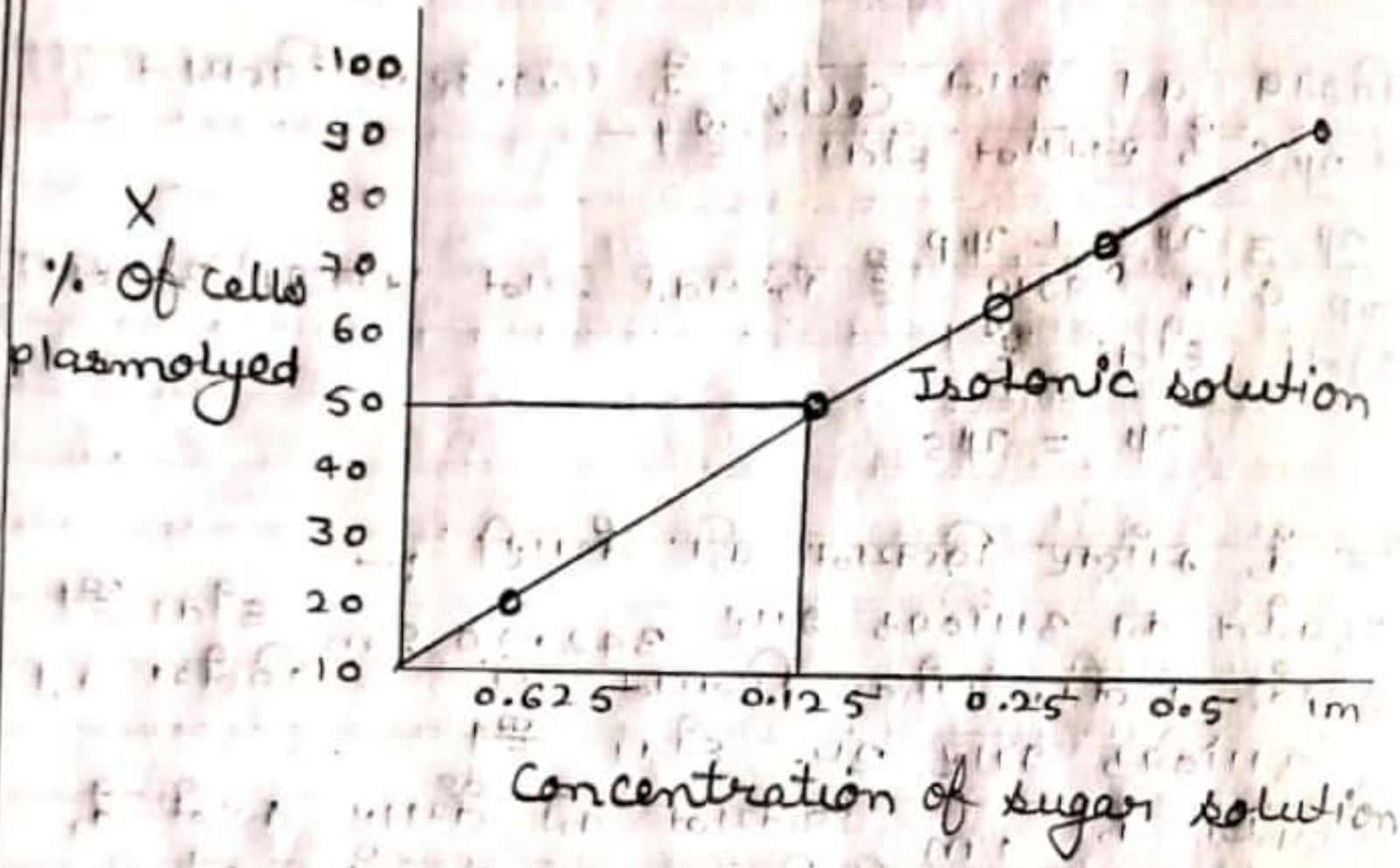
To prepare 1M solution of sucrose, take sucrose per 1 lit. 342.30 gm of

Distilled water (iv) Prepare a set of 6 test tubes. Pour 20 ml of 1M sucrose solution into a test tube (7) and label it with resin.

(vi) This is how we label all test tubes.

Procedure: Cut the leaves of a Rheo or Plasma onion into small pieces. Place the epidermis of different sucrose concentrations in a watch glass.

Teacher's Signature.....



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Transfer the solution and leash the 0.0625m cell.

Place a piece (ii) of the lower epidermis in the watch glass so that it is completely immersed in the solution.

the help of a microscope (1 with unplasmolized cell).

The number of plasma cells is calculated

Rang-Each outer civa is treated by dipping it

solution.

in the

Calculation :- on = M array potential

OP = molality of the solution

= M i ionic constant

R = gas constant (10.082) =

T = Ansalute temperature (273°C + room temperature)

Conclusion - The value of osmotic potential can be calculated by putting the experimental value in the above formula, for example, let the value of X be

The working temperature value is = y

na op will be = XxIx0.082 x (273+y)

Result :-

Caution - 1i) Prepare sucrose solutions carefully.

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Exercise-3

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उद्देश्य :- To Demonstrate the rate of transpiration by use of potometer's

Requirements: —— Farmer or growing potometer, twigs of healthy plant, stop five, beaker, Vaseline, water.

principle —— Some of the water absorbed by transpiration. – plants is lost to the atmosphere through (ii) The process of loss of water in the form of vapour from various aerial parts of the plant is called transpiration.

Transpiration can take place in three ways - (11) ("") p.yi 40 / stomatal, cuticular and lenticular.

farmer's Potometer

Process :-

In this device, a wide-mouthed bottle is taken and a three-marked it. cork is placed on

The glass – tube (ii) going to the water collector is inserted into a hole at the end.

A bent glass tube is placed at the tip of the other (iii) end of the cork.

liv) A slanted branch of the plant is placed in water in the middle part.

(7) All this equipment does it.

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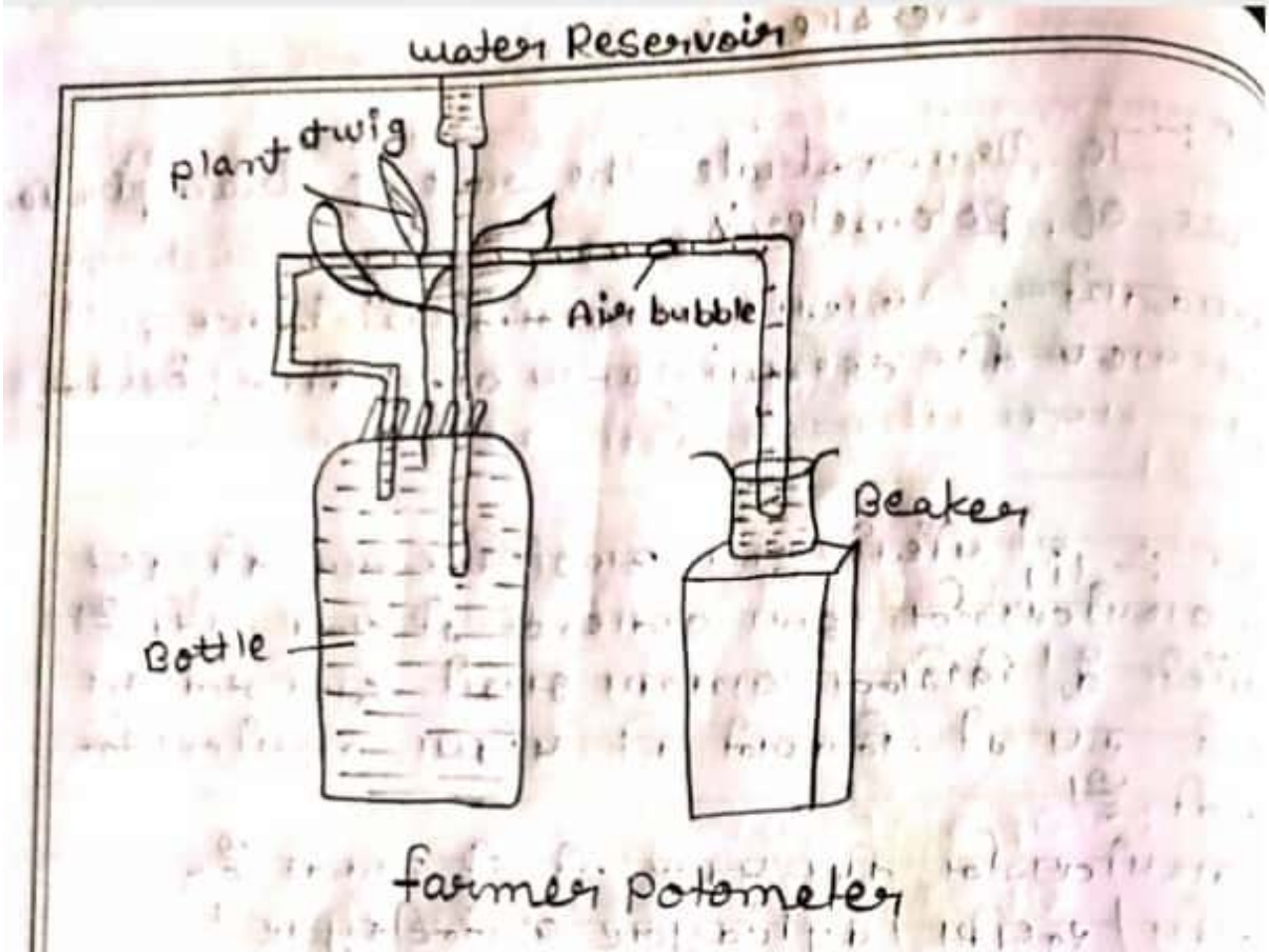
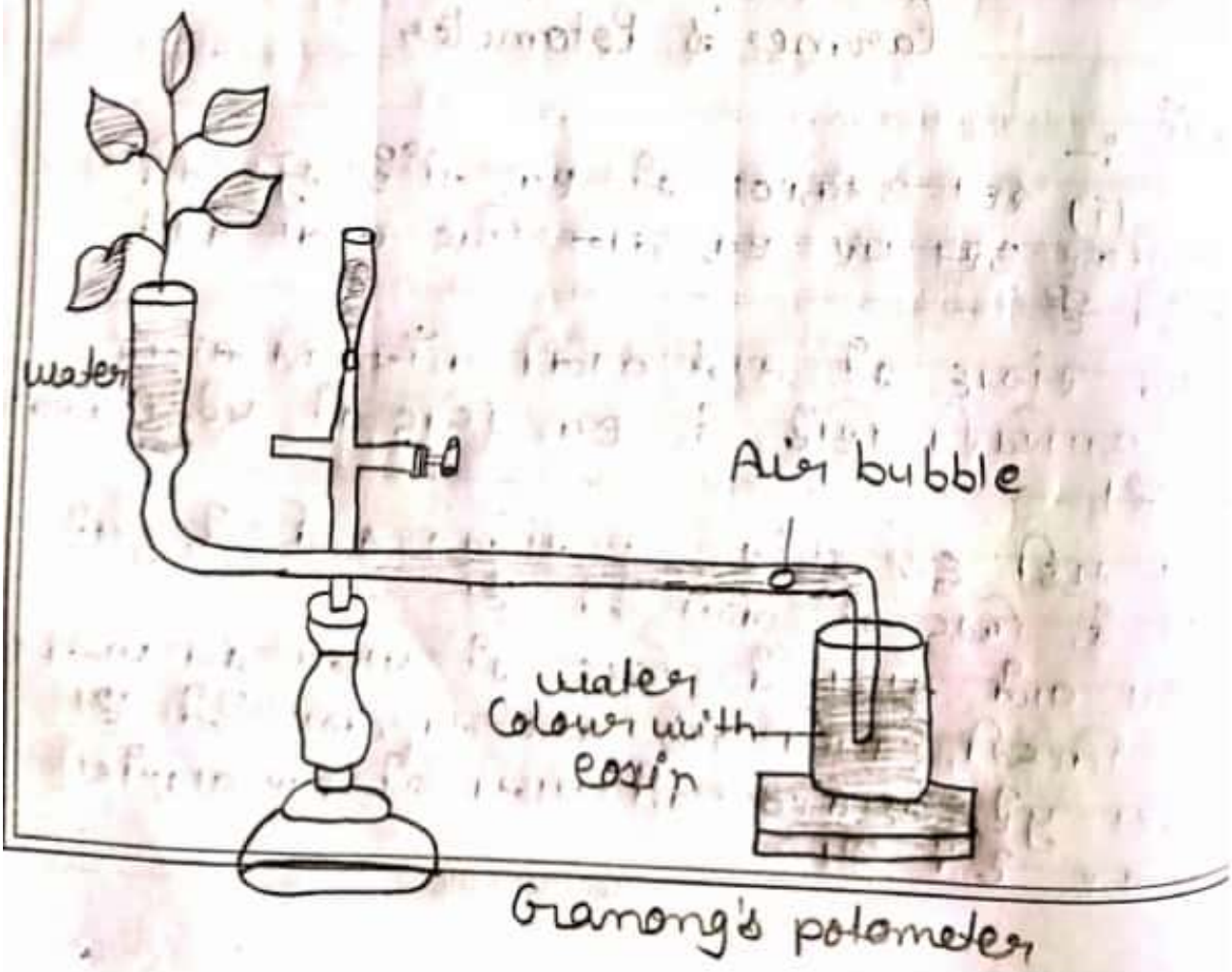
Teacher's Signature.....



farmer potometer



Ganong's potometer

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(c) One part of the bent glass tube is immersed in a beaker filled with water.

Ganong's Potometer

Process: This device consists of a wide-mouthed corked bottle with a hole in it and another wide-open glass bottle.

(ii) The entire apparatus is filled with water. The cork of the wide-mouthed bottle has a hole drilled in it.

(iii Place a slanting branch in water. A healthy plant in the beaker. (iv) One end of a bent glass tube

(10) The goddess puts water

Before starting the experiment, inject a bubble into the curved glass tube (5) and insulate the entire tube. The apparatus can be kept in the sun for 15 minutes. (vi) The speed of transpiration is measured by the speed of the bubbles.

For example, water evaporates through a branch. Transpiration occurs. An air bubble also moves forward in the glass cavity. The speed of this bubble depends on the atmospheric conditions.

Exercise - 4

PAGE NO. ..... DATE .....

उद्देश्य - To separate chloroplast pigment using paper chromatography

Spinach or Bougainvillea 1, Watermelon

Requirements-41 SW leaves, chromatographic No. 1, Filter Paper, Muslin Cloth, Beaker, Petroleum Emulsion, Acetone.

Chromatography: Chromatography is a technique that It is used to separate different chemical compounds that exist as mixtures. This technique is based on the selective distribution of the subcompounds within the mixture between two phases.

Rf = Distance travelled by the solute from the initial point / Distance travelled by the solvent from the initial point Principle • Chromatography is a method which Substituents in a mixture can be separated and characterized according to their solubility in a specific solution system.

Process

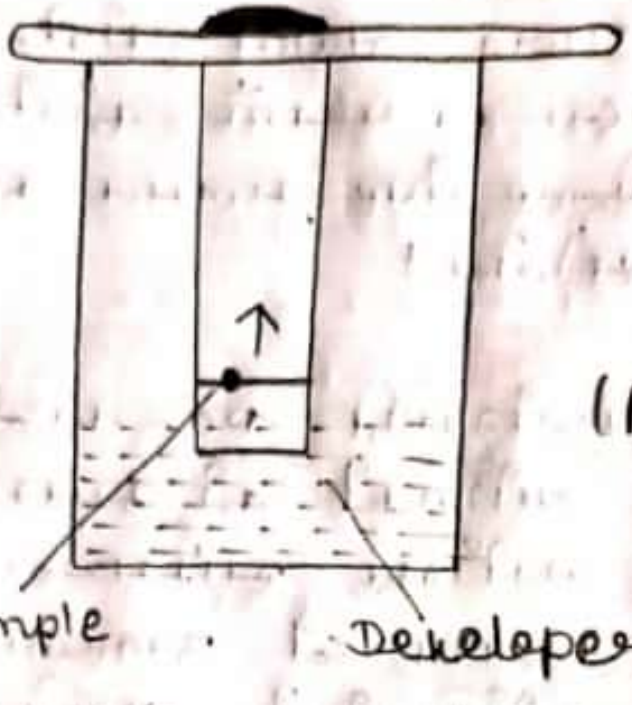
9 Extraction of chromatography in Synton -

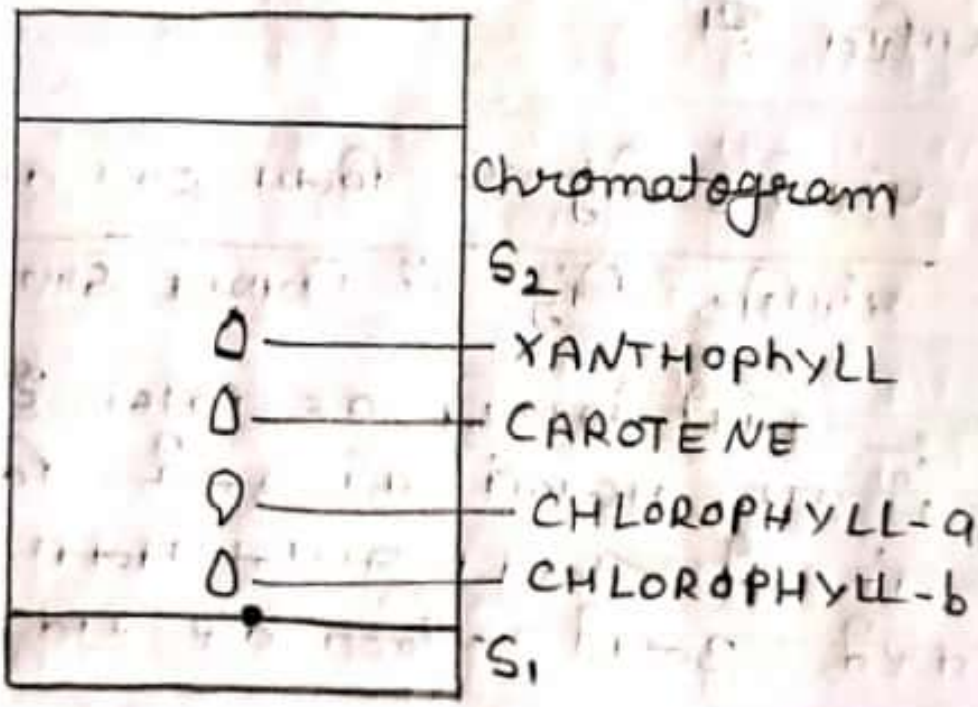
21 (i) of the leaves of the broken plant and Weigh Add 10ml of 80% cold acetone. grind them into a paste.

(ii) this 750-1000 rpm centrifuge at for 750 minutes

Priyanshu

Teacher's Signature





dig - Chromatographic strips showing spots of Chlorophyll pigment (A) Chromato-graphic chamber (B) Chromatogram showing spots

DATE .....

Preparation of solvent system

EBA 12 is prepared petroleum (8ml) of Rasseeling from La and with the help of solvent system.

(1)19 (i) this solvent system for hanging the chromatogram

Now prepare

Preparation of comatose

Cut the piece into long and wide strips of 40x247 1/2 Whatman filter paper.

2.5 cm from the mark, draw a line in it (1ii) with a pencil across the width of the plate.

Spot Application :- With the help of a capillary tube or the handle of an olpin, a spot of the filtrate sub-centre is placed on the containing the 10-dimer strip.

Once the spot dries, carefully reapply the spot (ii) times and this 3-4 times. let it dry again. Do

Observation of the spot Chromatogram after 2 hours Spot ha alakaran kura :- 1i) 20

The distance covered by the solvent is marked with a pencil (ii).

Chlorophyll pigments become visible on the chromatogram (111).

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test

DATE .....

क्र.सं.	वर्णक	Bindu Karanga
1.	chlorophyll-v	blue green
2.	Chlorophyll - b	yellow yes
3.	carotene	Orange yellow
4.	Janyo Phil	Yellow

precautions :—

The spot should be applied carefully and repeatedly in the same place.

(ii) The first spot should be dried before applying the second spot.

(1) The chromatographic paper should be held on the seat.

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Exercise - 5

Objective — Separation of chlorophyll pigment by solvent chromatography.

Spinach leaves, separating funnel, pestle and mortar, measuring cylinder, beaker, funnel, test tube, acetone 80%, 15%, alcohol, petroleum effervescent, chloroform and KOH.

Process:

1. Extraction of pigment in acetone

(i) 10gm of green plant

(ii) Grind it with a pestle mortar in 10ml 80% acetone.

(iii) Add 80% acetone to it and make it 50ml.

2.1 Extraction of minerals in petroleum distillery -

(i) Separating funnel 250 ml-c Acetone is transferred from the plant extract through the top hole.

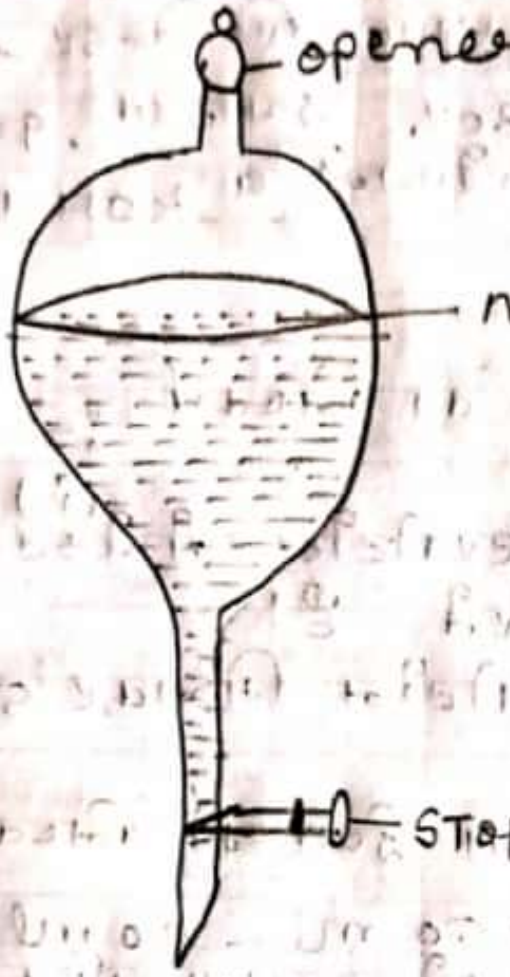
Again add 60 ml of Pedolium Eber and shake clockwise for 1 minute.

Add 10 ml proportion of distilled water to it and (iii) stir anticlockwise

3. Extracts in methamphetamine-

(1) Remaining upper 50ml 12, methyl alcohol

Two layers will be formed – upper green petroleum oil and lower (ii) methyl alcohol.



Separating funnel

PAGE NO solution of dolium Iber Pern A _D DATE .....

iv) This layer is composed of 11 different types of carotene.

(i) used to do

(ii) Transfer approximately A Separating 30ml to the upper ear cavity.

After that add 30ml distilled water and shake it anti-clockwise.

5. Methyl alcohol of part B

(iii) This node separates xanthophylls. chlorophyll-b from

Remove the lower node when the diffusion is visible.

(i)

15ml 30% Miboliver (III) is added to the upper layer and kept for 3 minutes.

Result

(i) chlorophyll b a and in a is yellowish green in colour and the

(ii) The key festival is olive green in colour. b Carotene and so internodes A in the sub-intestinal lower

Carotenes are light yellow in colour and zeylani (15) are dark yellow in colour.

precautions

First of all, practice thoroughly before consuming the separator funnel by making a swirl in the upper part and taking it out from the lower tube.

PAGE NO. Exercise – 6

DATE

purpose :- Separation of amino acids in a mixture by paper chromatography

Requirements: Plant extract or standard amino acid, chromatographic chamber, sinker, measuring cylinder, capillary tube, pressure, brennol, glacial acetic acid

Principle: Amino acids can be separated by paper chromatography using H1-2 chromatography in which both stationary and mobile phases are used.

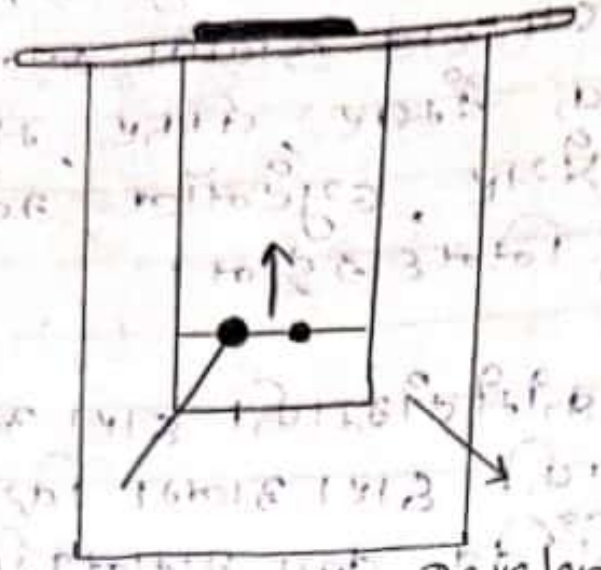
Method - The entire method is divided into the following four steps-

Preparation of solutions of known/unknown amino acids in distilled water — 0.1: Solutions are prepared by adding known amino acids. In another vial, more than one amino acid is added to distilled water.

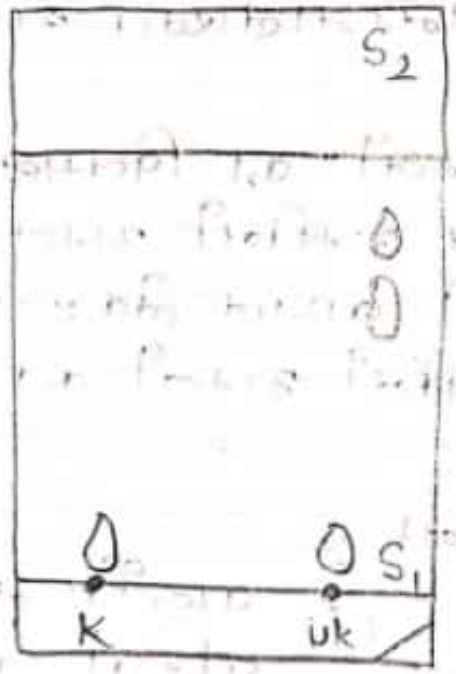
Preparation of chromatogram:-

1. Taking a paper measuring 40x24 cm (iiiii), leaving 3.5 cm space from the width of the paper with a pencil and cut out filter (i) strips of Whatman No. 1.

(iii) Two circles are drawn on this line in such a way that the distance between the two circles is more than 2.5 cm



(A)



(B)

dig - (A) Chromatographic chamber
(B) Chromatogram showing unknow and known amino acids

PAGE NOLION MIXTURE :- (i) n-butanol tear water 2 acetic acid in the ratio of 4:5:1 using solution system.

This solution mixture is first placed in a chromatography chamber (ii) and saturated with its vapor.

Separation of amino acids - To separate the amino acids, spray the chromatogram with ninhydrin. ninhydrin in acetone. Take 0.1 gm and add it to 100 ml.

Observation -

(i) After the comatogram is ready, note the chamber number of the spot present on it.

(ii) The Rf of each is calculated using the following formula:

Rf= Distance covered by amino acid spot D, K distance from the marker S_2 am through the separator

Rf value and Ninhydrin colours of protein

S.N.	Amino acid	Butanol Alcohol (BAW)	Phenol / water	Colour
1	Glycine	18	24	Red violet
1	Proline	40	50	Yellow
1	Aspargine	14	—	Orange brown
1	Aspartic Acid	17	06	Blue Violet

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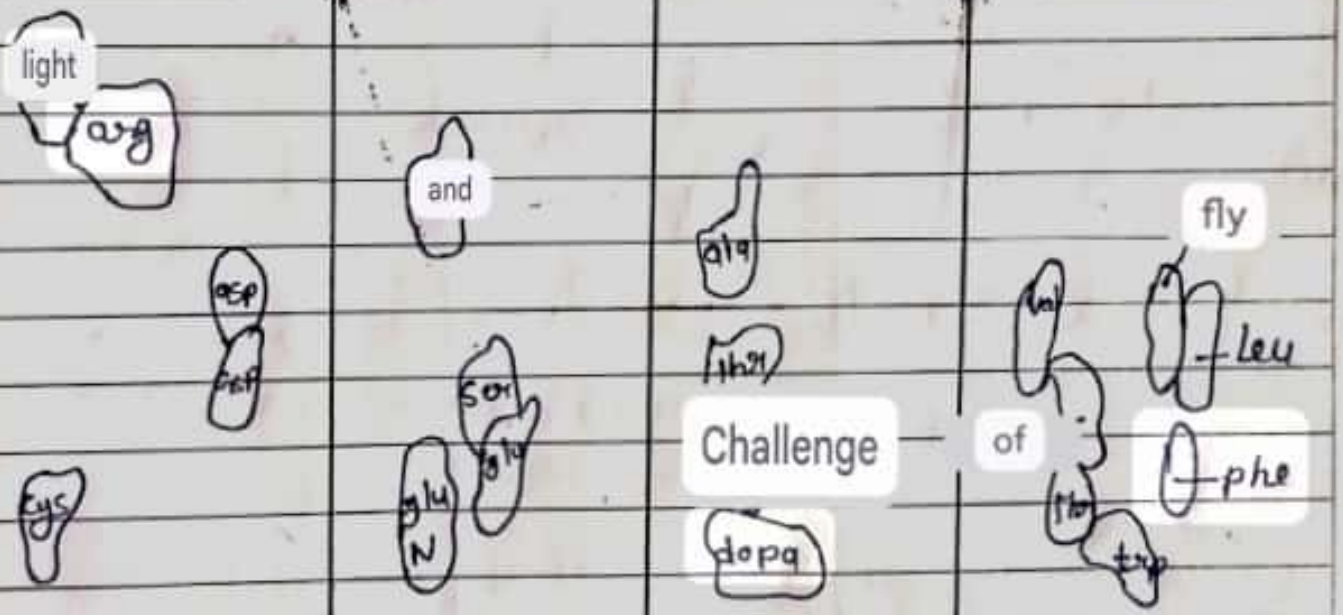
1	Alanine	22	29	violet
2	Argentina	06	19	violet
3	Cysteine	10	04	violet
4	Glutamine	25	—	he sees
5	Glutamic	24	10	violet
6	acid	43	40	violet
7	Isoleucine	44	48	violet
8	Leucine	03	09	he sees
and	Lysine	35	49	violet
10	Metheonine/serine	18	20	violet
11	Threonine	20	26	violet
12	Valine	32	40	violet



Result: The filtrate may contain a variety of amino acids, which are separated by paper chromatography and show different spots.

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Exercise -7

उद्देश्य :- To Demonstrate the enzyme Activity

(i) Catalase enzyme

Requirements: Fresh potatoes, hydrogen peroxide, 3% HQ, blend, cork borer, test tube, beaker.

Principle:- Kinase enzyme hydrogen peroxide

It breaks down into water and oxygen. During this process, it is destroyed automatically and its activity increases.

It is destroyed at temperatures of 19°C or at acidic temperatures.

pH

24.0, Utelen

Enzyme 2420+ O_2 ↑

Method

Preparing the Aloo slices –

(i) Cut a cylindrical piece of potato with the help of a cork beater and cut it into many small pieces with the help of a mortar and pestle.

(ii) Transfer 3-4 potato slices into separate test tubes.

A, B, C

adds 02 201

A (111) notes the bubbles and

ml of HDPE solution is added to the test tube.

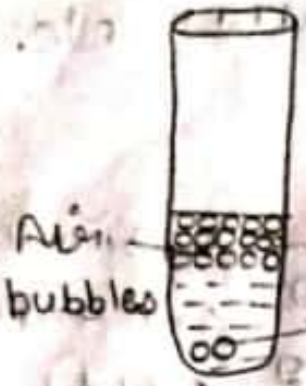
add the solution and observe the bubbles.

Now

(4) Boil the test tube

bubbles are produced.

and add 3% H_2O_2 to it and

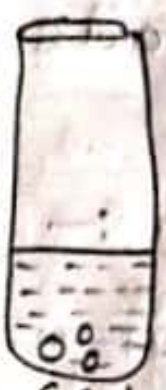


(A)

Pieces of Potato
+
3% of H_2O_2
↓
Air bubbles formed

(B)

Pieces of Potato
+ HCl
↓
Drain HCl
↓
Wash with water
↓
Add 3% of H_2O_2
↓
No air bubbles



(C)

Pieces of Potato
+
water (boil)
↓
Remove water
↓
Add 3% of H_2O_2
↓
No air bubbles

dig - Activity of Catalase

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Result

(iii) Test tube B Oxygen bubbles are not formed.

Test tube C Oxygen bubbles do not rise. (liiii)

conclusion:

11) The first test tube A shows the activity of the enzyme tailase, which comes at normal temperature. out in the form of bubbles

On adding milk to the potato pieces in test tube B, its pH becomes acidic.

precautions:

Use healthy potatoes. (i) The potato pieces should be of uniform size.

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2. Amylase Enzyme

Requirements:- Starch, Iodine solution, Diastase or potato pulp (A)

Benedict's solution is prepared by dissolving 7.3 gm of sodium citrate in 600 ml distilled water.

(B) 17.3 gg of liquor sulphate in 150 ml distilled water

(C) Solution B is – added to solution A.

Amylase enzyme:-. It is a wicked group of enzymes found related enzyme amylase (diastase) in living organisms and formed by the closely joining together.

Process :-

1ii) Take 1 tablet - of diastase and dissolve it in 100ml distilled water in two places.

1) Boil the test tube and keep it undrinkable.

2) Keep the test tube unboiled.

Both add starch solution to the test tube.

!!!) Benedivate solution is added to the test tube.

(iv) Colours see changes in colour.

Observation :-

(1) Pour 5 drops of the solution onto a porcelain tile and then add a drop of iodine solution. Observe for a blue color.

(ii) If colour does not appear, dilute amylase solution

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take And equal amount of Bol 1 cavity and test again.

tested immediately after adding 1¢2 of the solution to test tube 2.

The starch solution (iiiiii) is

There is no colour change in test tube because the temperature at Rez destroys amylase wicker. The colour of the solution in test tube 2 changes and gradually decreases.

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Objective - -Mohl's Half Leaf Experiment" (Half Leaf of Meal)

Requirements :- long leaf plant in a pot, wide mouth bottle with a cut cork in the middle, water solution of (iii) stand (we) beaker (v) आयोडीन (1%) (iv) KOH (20%) (vii) (viii)

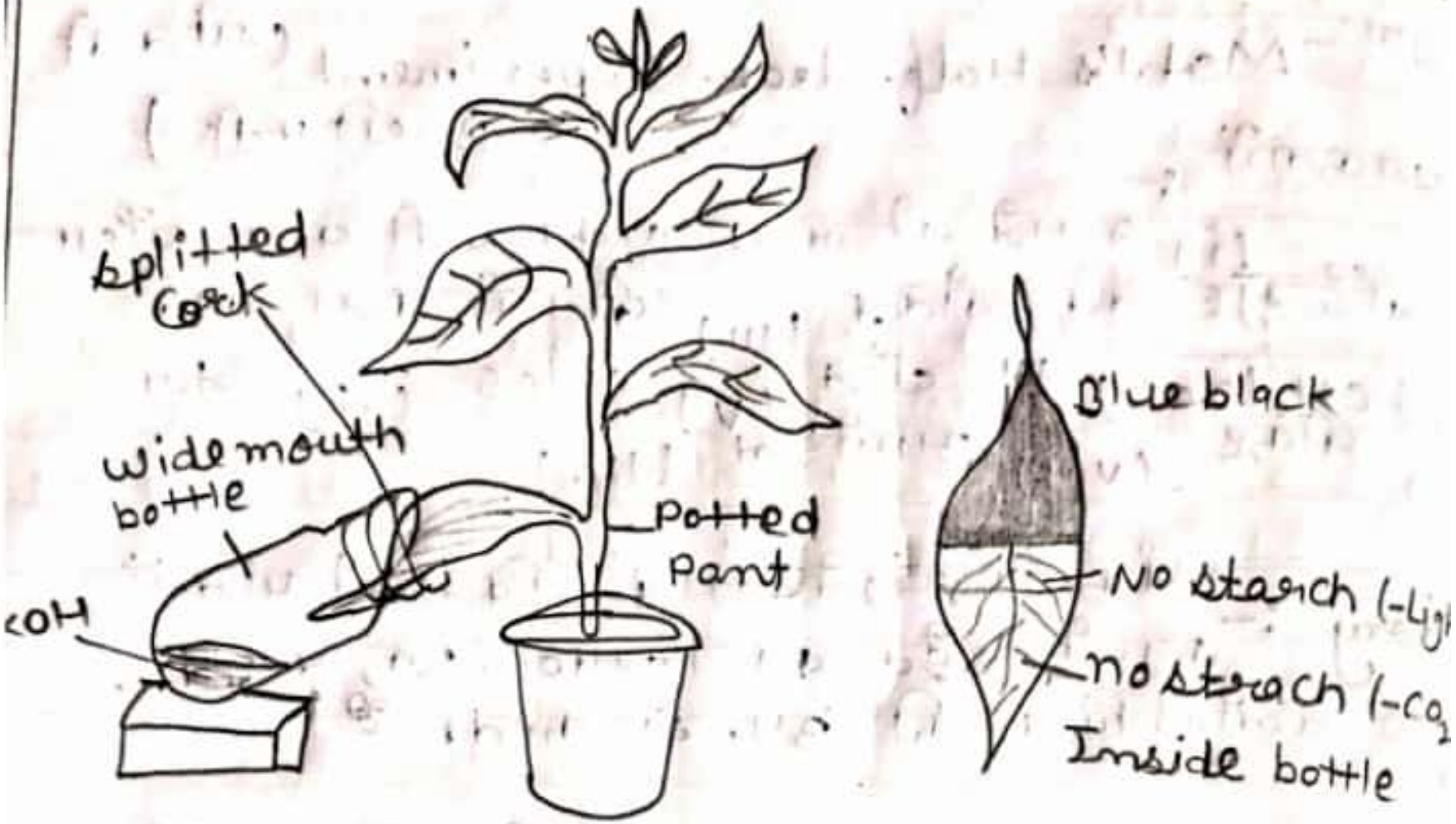
Theory:- Leaves break down carbohydrates into water, light, and chlorophyll.

After observing the plant in the pot for 48 darkness :- (ii) looking into the sub-mandibular structure in its leaves is 20% caustic potash solution in a bottle (ii)

(iii) Cut a slit in a square mouth glass bottle and put a cork in it.

(iv) In the morning, the long leaf in the pot is placed in a cork in such a way that half the leaf remains inside the bottle and the other half remains outside the bottle.

(v) Apply wax to all the pairs to make them airtight. (vi) Place the bottle on a stand and let it sit in the sun for 3-4 hours.



dig - Moll's half Leaf Experiment

Experiment :-

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The part of the leaf between the bottle and the cork gives a negative Ami Dean's test, while the part outside the bottle gives a positive test.

Precautions -

To make the leaves of a potted plant starch-free, the leaves should be kept in Ambkaal for 48 hours.

Potted plant leaves becoming longer (ii)

The code should be appropriate.

(111) The KOHark should be airtight. (10)

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उद्देश्य – Calculate Respiration Quotient (RQ) of different substrates by Ganong's Respirometer

Requirements :-

11) Ganning Respirometer (i) Respiratory base (iii) Caustic potash (iv) Salt wash (v) Stand (vi) Filter paper.

Theory :- During respiration, O_2 is used and CO_2 is released. The ratio of CO_2 released and O_2 consumed by a fixed weight of plant tissue in a given time is called respiratory coefficient.

Bhavasan coefficient

$$R.Q = \frac{\text{Volume of free } CO_2}{\text{Volume of absorbed } O_2}$$

processes

:- Place it on the stand of the tespirometer.

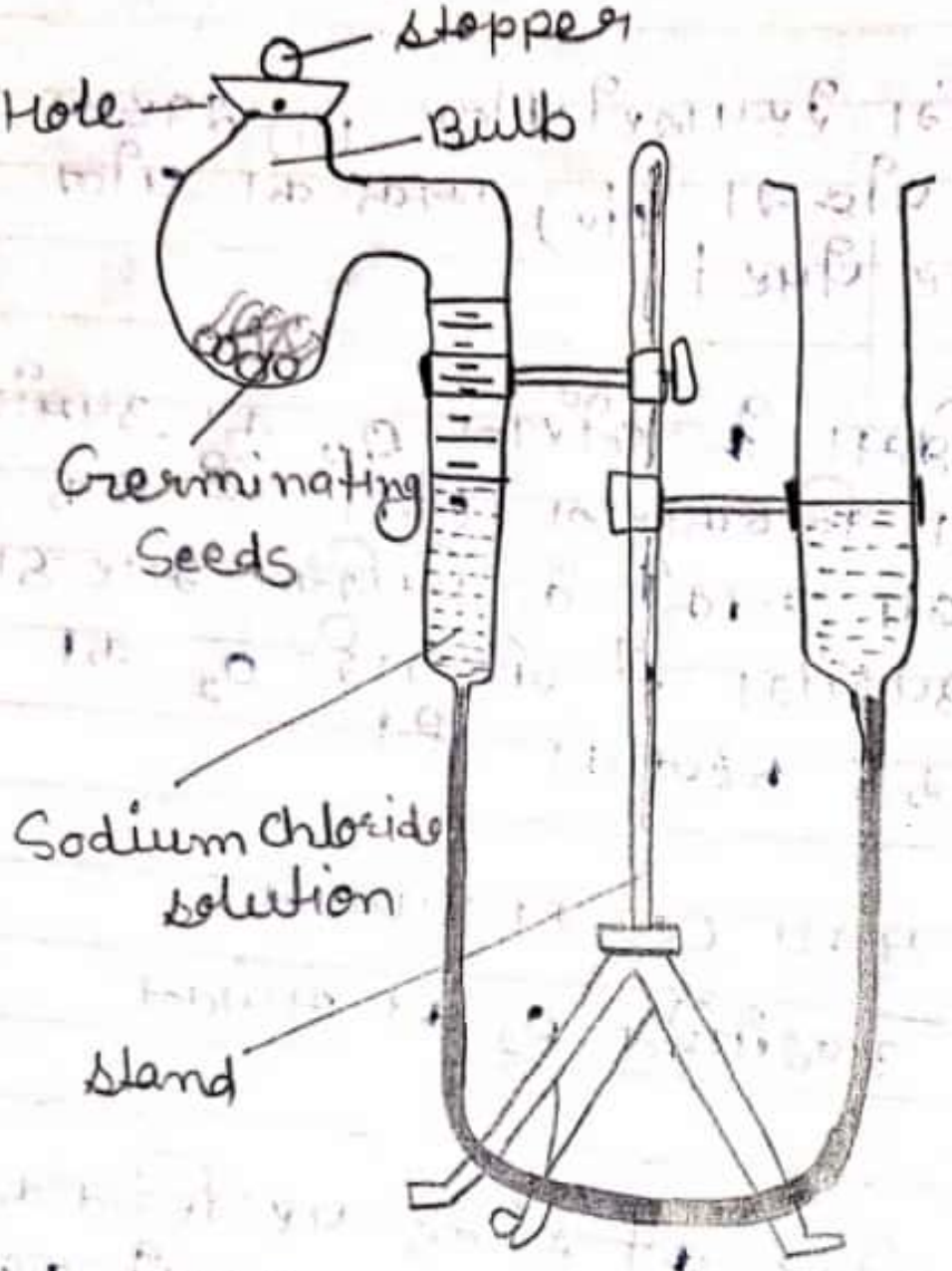
1iii) Open the bulb of the respirometer and put some water and a filter paper in it.

11) Place some shaken germinated seeds in the bulb

10) The two tubes of a respirometer are filled to a certain level with salt solution.

1) Turn the bulb's wick and turn it on simultaneously.

The initial level of salt solution is kept the same in both the tubes.



Cranong's Respirometer

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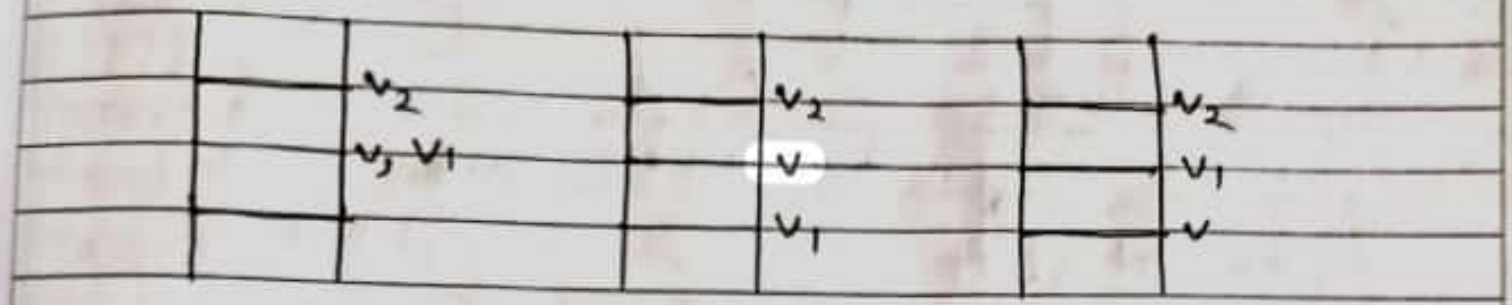
noted. After some time, the level of salt solution (ii) is again

(viii) inserting the tablet of Tax V into the tube, its level is again noted.

Observations and results



Level of saline water in diffrent Substra

(i) Respiratory carbohydrate – In the presence of respiratory carbohydrate, the salt level in the tube remains stable.

$$C_6H_{12}O_6 + 6O_2 = 6CO_2 + 6H_2O$$

(ii) Respiratory fat 'If castor are used as respiratory sprouted peas, gram, gram, - fat.'

Excess volume of CO_2, V2 = = O2 free

V_1

RQ = V2 = freed heel

$V_1 + V_2$ exploited 60

$$2C_{51} + 198O_6 + 145O_2 = 102CO_2 + 98H_2O$$

$V_1 = 43$, $V_2 = 102$

precautions — The apparatus should be airtight. (ii) Pour salt water into both the tubes through the leveling tube. Must bring level one.

Teacher's Signature.....

PRIYANSHU

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Objective :- Demonstration of Patato osmoscope, Aerobic and Anaerobic respiration, Rate of Transpiration, Arc Auxanometer.

Patato osmoscope

Healthy potato tubers, petri dish, 10% sugar solution, water, cord borer and cork

osmosis Surface transpiration of dried potato (ischmosis) :- (similar behaviour of the oyster Does it.

(ii) When two solutions of different concentrations are separated by a semipermeable medium, the diffusion of solvent from the solution of lower concentration to the solution of higher concentration is called osmosis.

Process :-

Peel a potato and flatten its bottom.

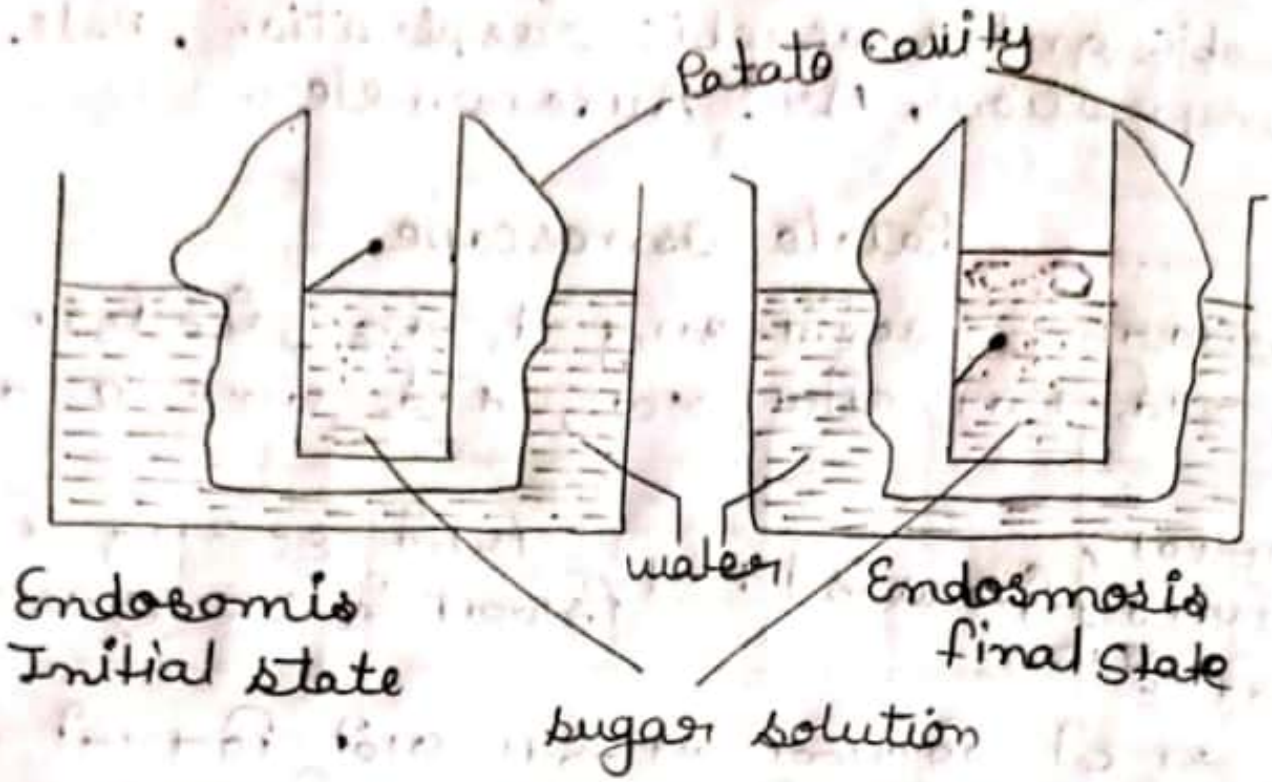
Using a peeler, make a cavity in the top of the lig.

(iii) Half fill this cavity with sugar solution.

Livan This complete device containing erysipelas. consists of a dish filled with water

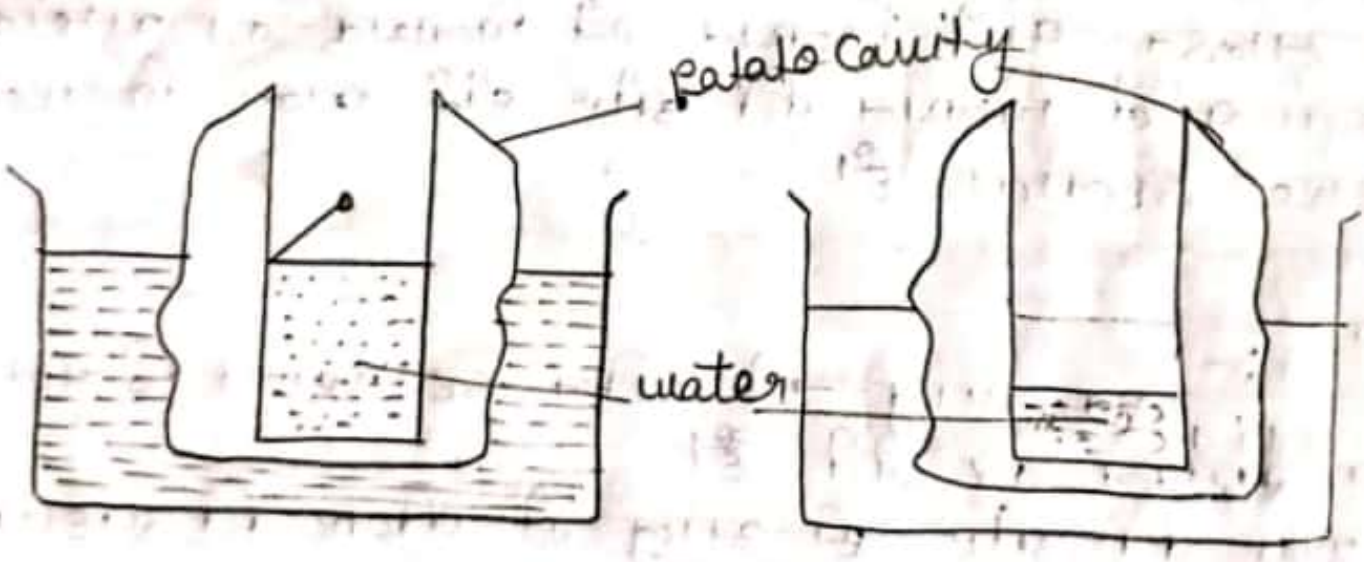
(0) The experiment is allowed to stand for some time. (vi) In the second experiment, potato cavity is filled with water mixed with eugenol.

Teacher's Signature.....



Endosmosis Initial state

Endosmosis final state



Exosmosis Initial state

Exosmosis final state

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The observation cavity sugar solution in the becomes constant to endosmosis. after some time due

The sugar solution cavity of the potato. turns pink in the

The level of osine-laden water in the pediplate started falling

Result :-

(i) Under endoosmosis, when water enters the cell, it is called endoosmosis.

Due to the flow of water inside the sub-spirit, the solution starts turning pink.

precautions

Potatoes of the right size 1 to be healthy.

(iii) Potato (iii) should be peeled in which the width and depth Potato type of the hole should be appropriate

(1) The sugar solution should be of boiled consistency.

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Aerobic and anaerobic Respiration

To demonstrate aerobic respiration

Requirements — Restart — Saline solution (v)

(iii) beaker (iv) Pauni Germinated seeds

Principle — Catabolic reaction is a catabolic process in which complex organic substances are oxidized.

When the process of respiration takes place in the presence of oxygen (ii), it is called ophthalmic respiration.

$CCH_2O + 60, 6CO_2 + 6H2O + 673$ kcal Energy

Process :- — Take a flask and put some water and some soaked gram in it.

A small test tube filled with (iii) KOH is hung from the front inside the flask.

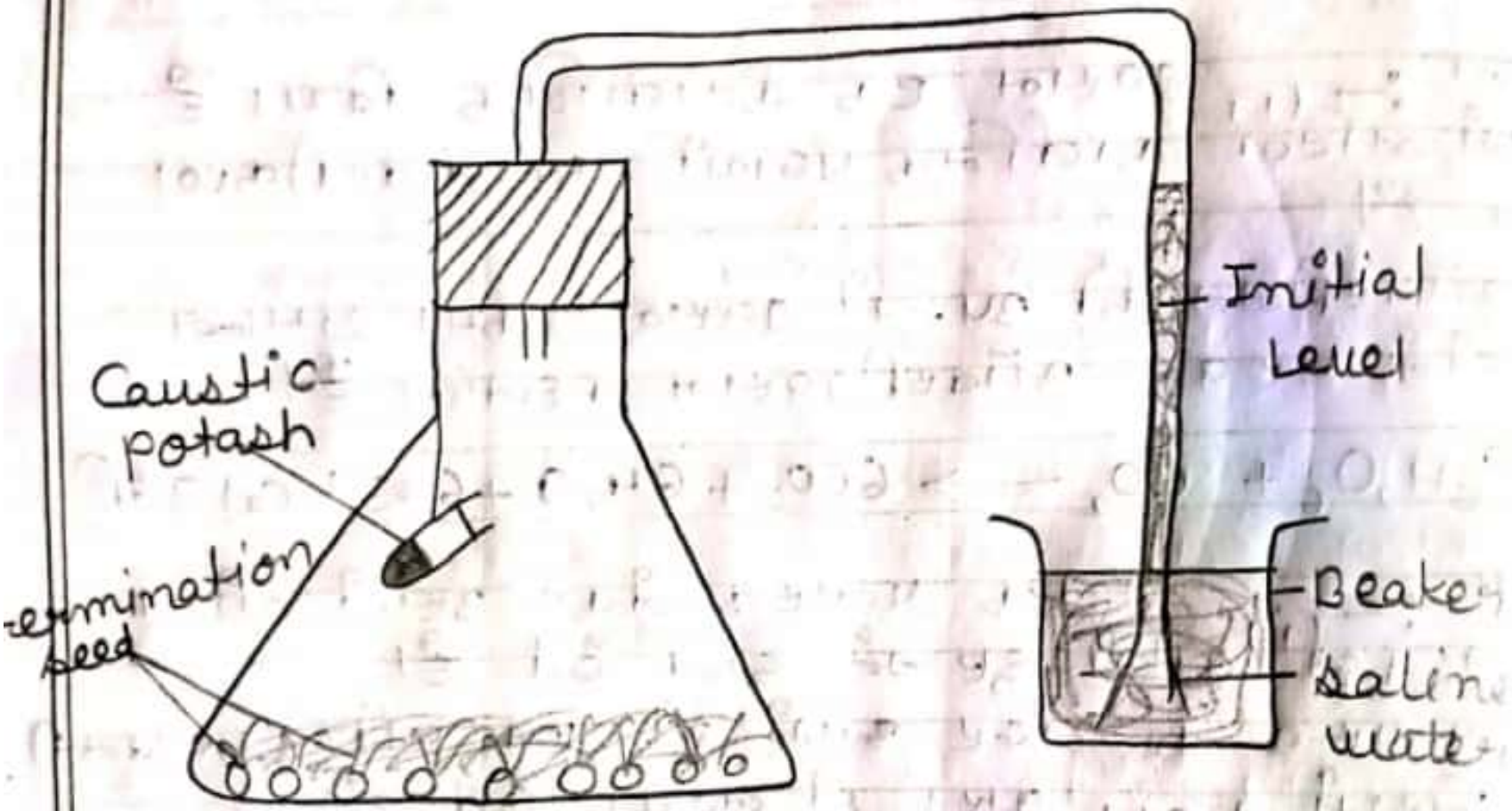
Place a cork (iii) on the mouth of the flask.

Two glass tubes are inserted into the flask through this hole.

(V) Leave this device for some time.

observation and conclusion :- The water level in the glass tube submerged in water rises. The sprouted chickpeas absorb oxygen from the flask and respire it, releasing oxygen.

Teacher's Signature



Kuhne's fermentation Vessel

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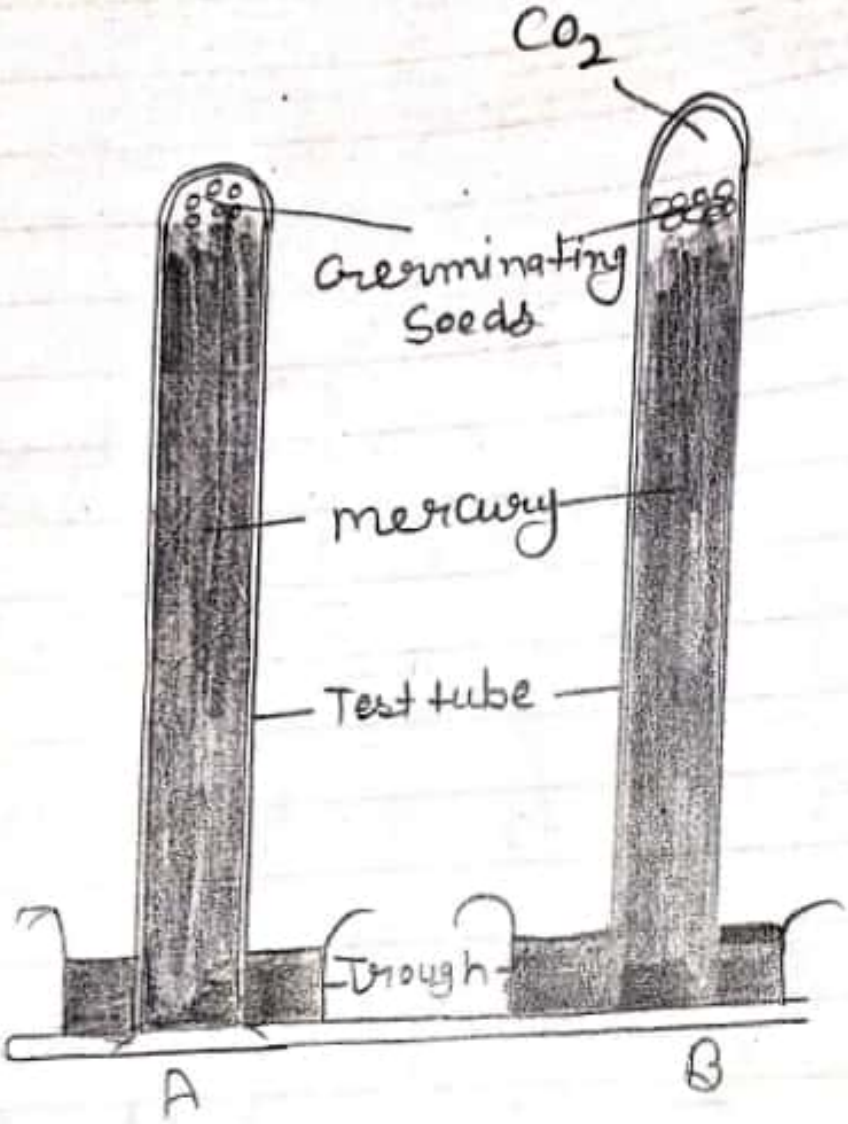
Result :— The water level in the glass tube submerged in water rises. The sprouted chickpeas in the retort absorb oxygen and undergo respiration. Consequently, a stagnation occurs in the flask, causing the water level in the glass tube submerged in the beaker to rise.



Determination of CO_2 evolution during anaerobic Respiration

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Anaerobic respiration

requirements — Test tube, KOH crystals, mercury, sprouted chickpea seeds, compressed, given on the same. Beaker, stand.

Catalytic Theory of Respiration: Complex organic substances like carbohydrates, proteins, fats are oxidized. In which:-

$C_6H_{12}O_6$ fermentation $Co_2 + C_2H_5OH$ + energy

प्रक्रिया

Mercury can also be extracted by taking a dish or beaker and

(ii) Take a small test tube and fill it with filling it with mercury.

Close the test tube with your thumb and place it in a padded dish.

(iii) Place it upside down.

iv) The test tube is held in place with the help of a stand.

(v) some Take the germinated seeds and put them in the test tube with the help of tweezers.

(vi) Leave some of the instrument for the bell.

observations and conclusions — After some time, the mercury level in the test tube drops. When KOH is dropped at the mouth of the test tube, it rises, and the mercury level rises again. Identification tube. is done by sending KOH into the test

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Growth of stem length by arc growth meter

मापना (To measure the growth in length of stem with help of arch auxanometer)

Requirements :-

(i) Arc growth ... Burden meter Healthy potted plant

thread

(iii) 2205 lives)

(v)

Growth in plants is an important effect theory which produces many types of physiological activities in plants.

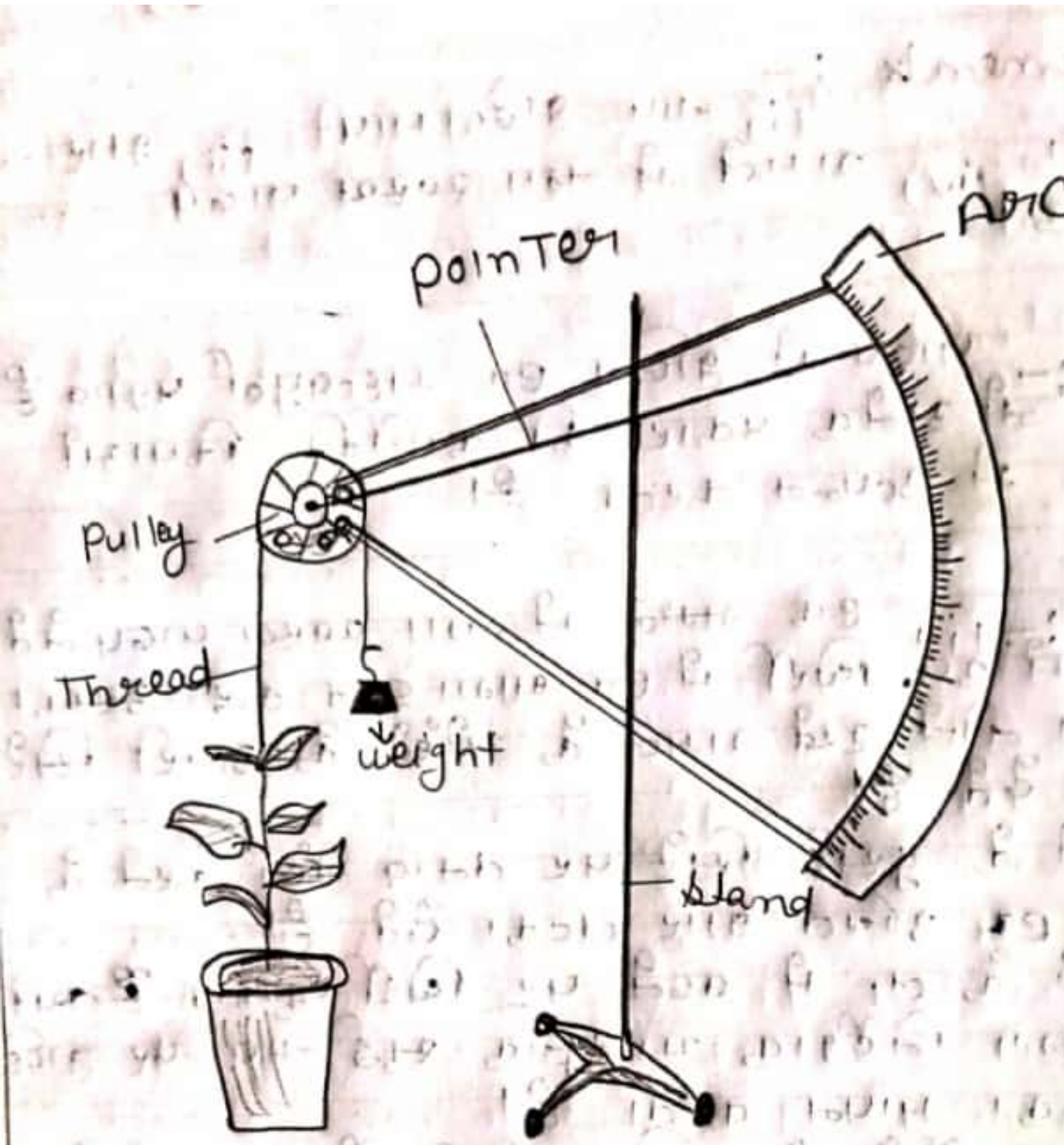
Take a healthy potted plant. Method ibi: Insert a branch into the ring and tie one end of it to the upper end of the potted plant placed below.

A suitable weight is hung at the other end of the thread to create tension (iii).

10) As the plant grows in length, the girdle rotates and the indicator attached to it measures the rate of growth along the arc.

As the plants grow, the weight decreases and the rate of growth of the seed indicator also decreases.

The distance shown is many times greater than the actual linear display, hence the actual growth of the plant can be estimated.



आर्क वृद्धिमापी

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Observation:- The rim rotates with the growth of the plant and due to tension the indicator rotates slowly on the arc and measures the growth.

Precautions :-

The plant should be healthy.

(ii) This is an experiment. During this, the pot should be watered regularly.

(iii) The weight should be appropriate.