

10th Standard – Science - Practical

1. Classify the given fruit and give reasons with diagram.

Aim : To identify and classify the given fruit.

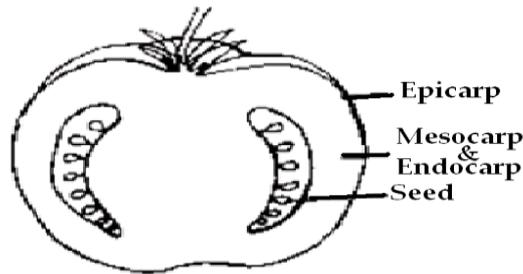
Identification : The given fruit is identified as **L.S. of Tomato.**

Classification : Simple fleshy fruit – Berry – L.S. of Tomato.

Reasons :

1. Fruit is developed from the single flower, multicarpellary, syncarpous and superior ovary.
2. The entire fruit is edible.

Simple fleshy fruit – Berry -Tomato



Result: The given fruit is classified as Simple fleshy fruit – Berry

1. Classify the given fruit and give reasons with diagram

Aim : To identify and classify the given fruit.

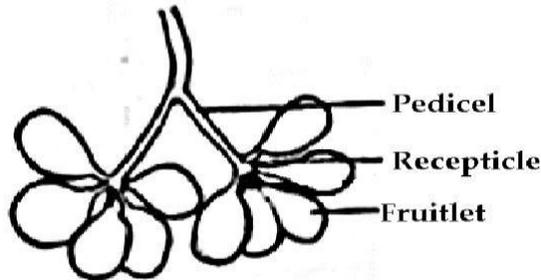
Identification : The given fruit is identified as **Polyalthia.**

Classification : Aggregate fruit – (e.g.) Polyalthia

Reasons:

1. Polyalthia develops from the single flower with multicarpellary apocarpous ovary.
2. During fruit formation each free carpel develops into fruitlet.

Aggregate fruit – Polyalthia



Result: The given fruit is classified as Aggregate fruit – Polyalthia

1. Classify the given fruit and give reasons with diagram

Aim : To identify and classify the given fruit.

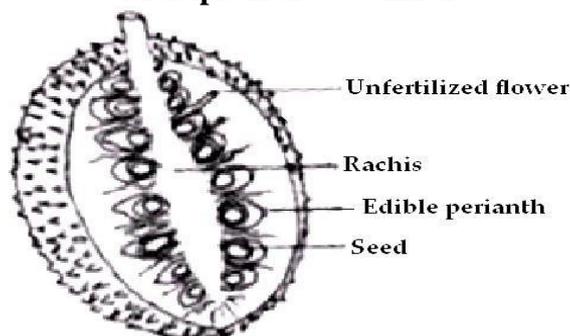
Identification : The given fruit is identified as L.S. of **Jackfruit**

Classification : Multiple fruit - (e.g.) Jack fruit

Reasons :

1. The entire female inflorescence develops into a single fruit.
2. The fertilized flowers develop into fruitlets.

Multiple fruit - Jackfruit



Result: The given fruit is classified as Multiple fruit - Jack fruit

2. Dissect and display the floral parts like Calyx, Corolla, Androecium and Gynoecium of any locally available flower

Aim : To dissect and display the floral parts like Calyx, Corolla, Androecium and Gynoecium of any locally available flower

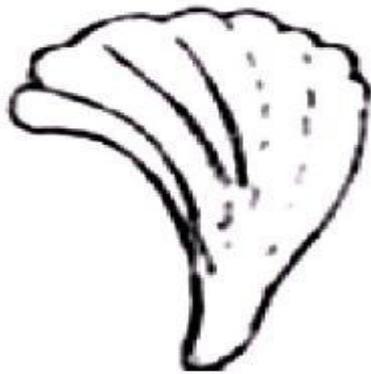
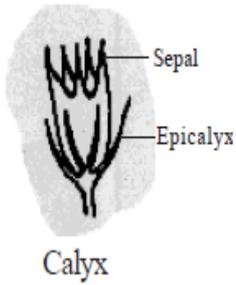
Materials Required : Dissection needle, Small knife, white paper, simple microscope, slide, forceps and Sellotape.

Flower taken for dissection : *Hibiscus rosasinensis*

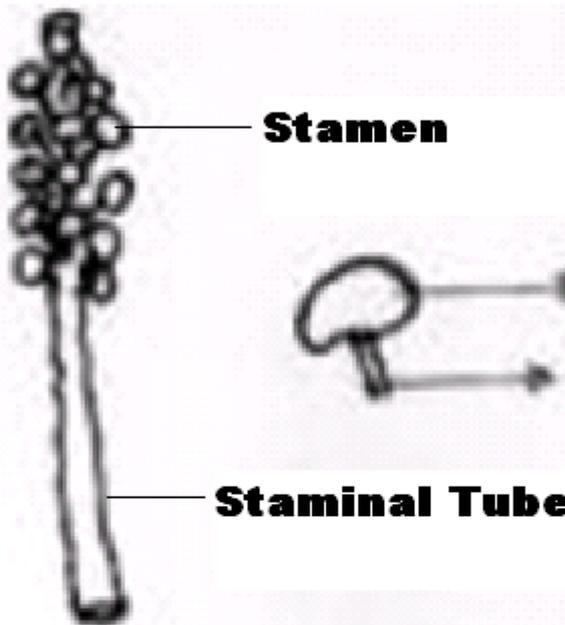
Procedure :

1. Calyx, Corolla, Androecium and Gynoecium of the flower of ***Hibiscus rosasinensis*** are separated and pasted on a white paper.
2. The parts of Androecium and Gynoecium such as anther, filament, ovary, style and stigma are labeled.

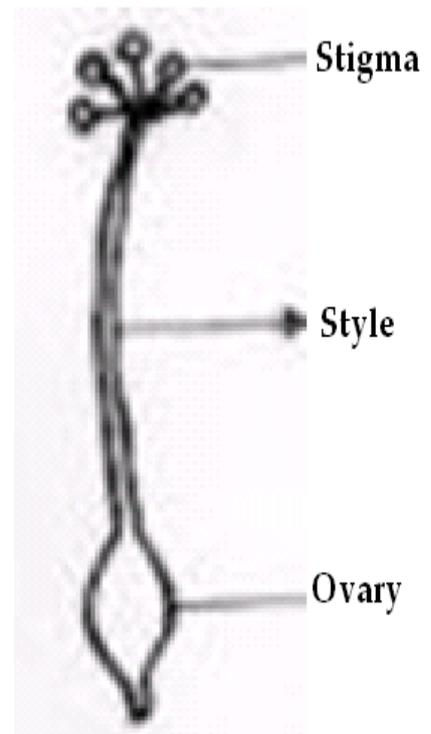
Floral parts of the flower *Hibiscus rosasinensis*



Petal



Androecium



Gynoecium

Result: The floral parts of the flower *Hibiscus rosasinensis* are separated and displayed

3. Identify the given slide with help of microscope and write the reasons with labeled diagram.

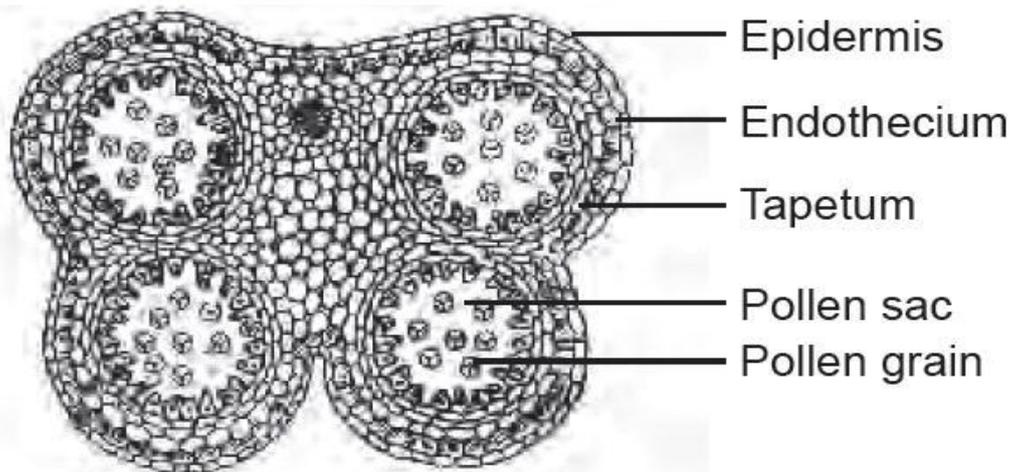
Aim: To identify the given slide with help of microscope and to write the reasons with labeled diagram.

Identification: The given microslide is identified as **T.S of Anther**.

Reasons :

1. Each anther lobe is covered by 4 layered wall.
2. The inner most layer of the wall is called tapetum.

T.S of Anther



Result: The given microslide is identified as T.S of Anther.

3. Identify the given slide with help of microscope and write the reasons with labeled diagram.

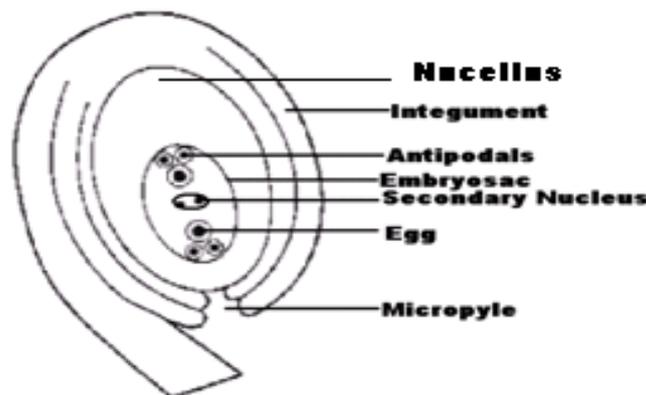
Aim: To identify the given slide with help of microscope and to write the reasons with labeled diagram.

Identification: The given microslide is identified as **L.S of Mature Ovule**

Reasons :

1. The ovule consists of central nucellus surrounded by two protective coats called integuments.
2. The embryo sac is found inside the nucellus.

L.S of Mature Ovule



Result: The given microslide is identified as L.S of Mature Ovule.

4. Fermentation Experiment (Anaerobic Respiration)

Aim : To prove the fermentation process.

Materials and apparatus required:

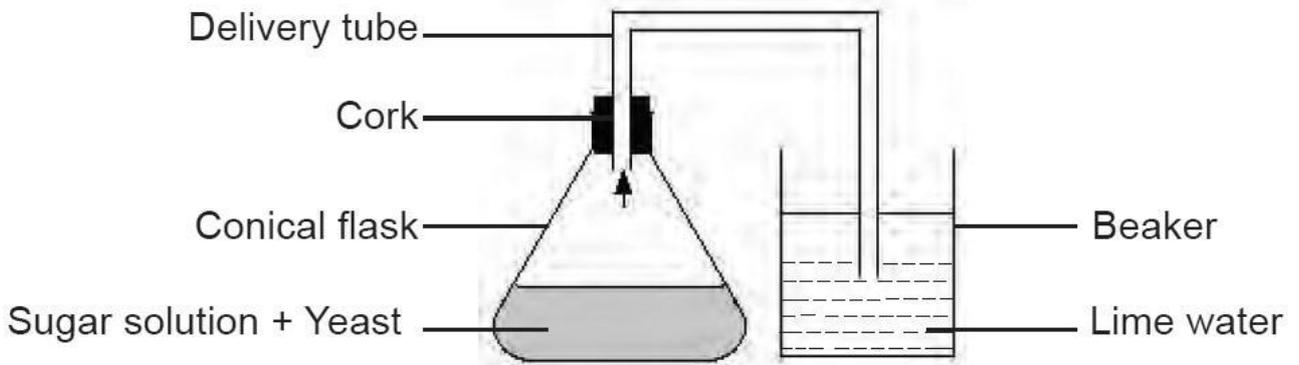
Sugar solution, Baker's yeast, conical flask (250ml), Beaker and Lime water.

Procedure:

1. Take sugar solution with small quantity of baker's yeast in a (2/3) conical flask.
2. Close the mouth of the conical flask with one holed rubber cork and insert a delivery tube in the cork.
3. Immerse the other end of the delivery tube in a beaker containing lime water.
4. Keep the apparatus in sunlight for 2 hours.

Observation:

1. After 2 hours, it is observed that lime water in the beaker turns milky.
2. Remove the stopper of the flask and an alcoholic smell is observed.

**Result:**

1. Due to fermentation of sugar solution, CO_2 is released and ethanol is formed.
2. The CO_2 turns the lime water milky and the smell is due to the formation of ethanol.
3. Hence the process of fermentation is proved.

ஆக்கம்: ச.பாலசுப்பிரமணியன் எம்.எஸ்ஸி, எம்.எட், பா.மீனா எம்.எஸ்ஸி,பி.எட்,
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தீர்த்தபதி மேல்நிலைப் பள்ளி, அம்பாசமுத்திரம்.

5. Identify the given model and write the notes with labeled diagram.

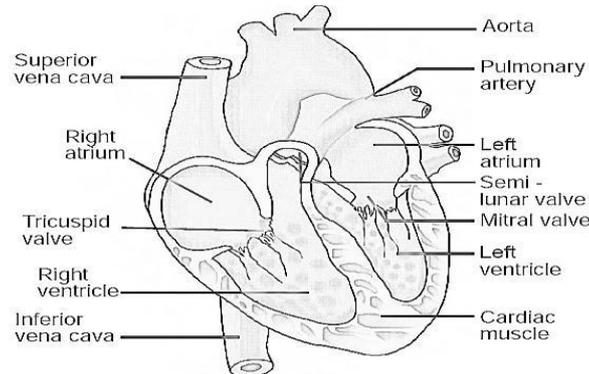
Aim : To identify the given model and to write the notes with labeled diagram.

Identification: The given model is identified as **L.S. of Human Heart**.

Notes :

1. Heart is covered by a protective double walled sac called pericardium.
2. It has four chambers namely two auricles and two ventricles.

L.S.of Human Heart



Result: The given model is identified as **L.S.of Human Heart.**

5. Identify the given model and write the notes with labeled diagram.

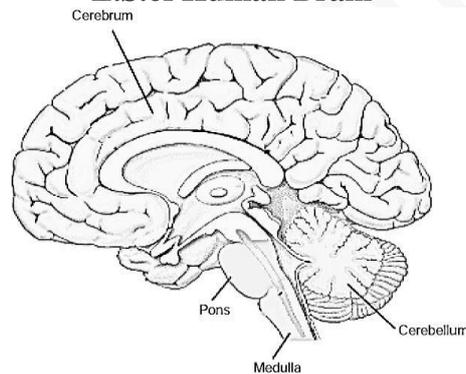
Aim : To identify the given model and to write the notes with labeled diagram.

Identification: The given model is identified as **L.S.of Human Brain.**

Notes:

1. Human brain is divided into three major parts namely forebrain, midbrain and hind brain.
2. Human Brain contains millions of neurons.

L.S.of Human Brain



Result: The given model is identified as **L.S.of Human Brain.**

5. Identify the given model and write the notes with labeled diagram.

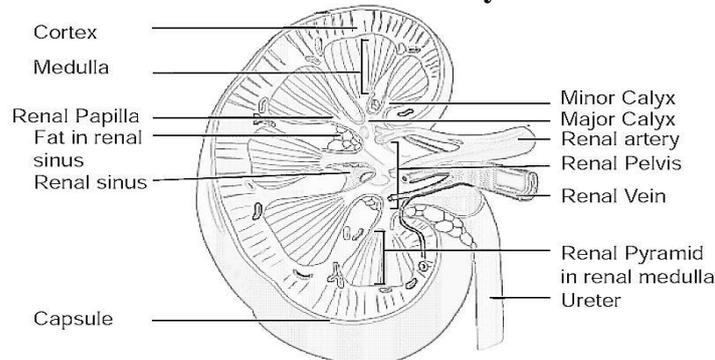
Aim : To identify the given model and to write the notes with labeled diagram.

Identification: The given model is identified as **L.S. of Human Kidney.**

Notes:

1. Kidney is the principal excretory organ of our body.
2. A kidney has about 1.0 millions of functional units called nephrons.

L.S. of Human Kidney



Result: The given model is identified as **L.S. of Human Kidney.**

6. Identify the flag labeled endocrine gland and write the location, hormones secreted and their functions.

Aim : To identify the flag labeled endocrine gland and to write the location, hormones secreted and their functions.

Identification: The marked endocrine gland is identified as **Thyroid gland**

Location : Thyroid gland is a bilobed gland located in the neck region on either side of the Trachea.

Hormones secreted: Thyroxine

Functions of Hormones:

1. Thyroxine increases the basal metabolic rate (BMR).
2. It regulates Iodine and sugar level in the blood.

Result: The marked endocrine gland is identified as **Thyroid gland**

6. Identify the flag labeled endocrine gland and write the location, hormones secreted and their functions.

Aim : To identify the flag labeled endocrine gland and to write the location, hormones secreted and their functions.

Identification: The marked endocrine gland is identified as Islets of Langerhans in the Pancreas.

Location: Islets of Langerhans are seen embedded in Pancreas which is located in the abdominal region.

Hormones secreted:

1. α cells secrete glucagon and
2. β cells secrete Insulin and amylin.

Functions of Hormones:

1. Insulin converts glucose into glycogen and deposits in liver and muscles.
2. Glucagon converts glycogen into glucose.
3. Insulin and glucagon together control the blood sugar level.

Result: The marked endocrine gland is identified as Islets of Langerhans in the Pancreas.

6. Identify the flag labeled endocrine gland and write the location, hormones secreted and their functions.

Aim : To identify the flag labeled endocrine gland and to write the location, hormones secreted and their functions.

Identification: The marked endocrine gland is Adrenal gland.

Location: Adrenal glands are located above each kidney in the abdominal region.

Hormones secreted:

Adrenal cortex – Aldosterone and Cortisone.

Adrenal medulla – Adrenaline and Nor-Adrenaline

Functions of Hormones:

1. Aldosterone – Regulates mineral metabolism.
2. Cortisone - Regulates carbohydrate metabolism.
3. Adrenalin and Nor Adrenalin – prepare the body to face the stress and emergency conditions.

Result: The marked endocrine gland is identified as Adrenal gland.

7. Find out the presence of starch in the given food samples of A and B by using Iodine solution.

Aim : To find out the presence of starch in the given food samples of A and B by using Iodine solution.

MATERIALS REQUIRED:

Food sample A and B, Iodine solution, Test tubes, Test tube holder, Test tube stand etc.

PROCEDURE:

1. Take 1 ml of food sample A and B in separate test tubes.
2. Add one drop of Iodine solution in both test tubes and mix well.
3. Observe the colour change and record.

TABLE:

S. No.	Food Sample	Observation	Presence/Absence
1	A	No Characteristic change	Absence of starch
2	B	Dark blue colour appears	Presence of starch

RESULT: The food sample **B** contains starch.

8. Identify the given slide with help of microscope and write the reasons with labeled diagram.

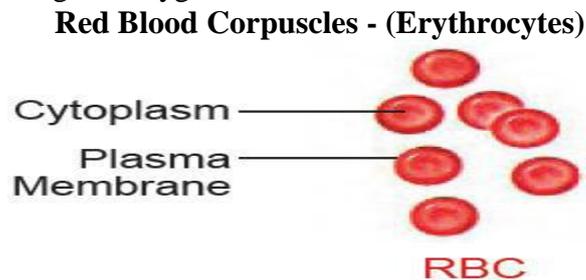
Aim: To identify the given slide with help of microscope and to write the reasons with labeled diagram.

Identification:

The given slide is identified as **Red Blood Corpuscles - (Erythrocytes)**

Reasons:

1. RBCs are circular, biconcave and disc shaped.
2. RBCs are concerned with carriage of oxygen.



Result: The given slide is identified as **Red Blood Corpuscles - (Erythrocytes)**

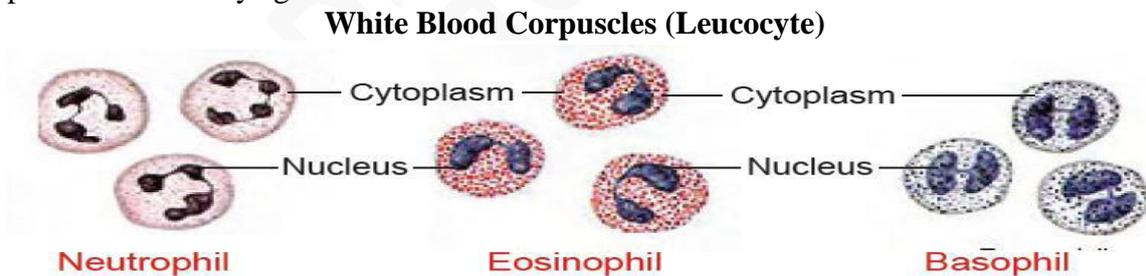
8. Identify the given slide with help of microscope and write the reasons with labeled diagram.

Aim: To identify the given slide with help of microscope and to write the reasons with labeled diagram.

Identification: The given slide is identified as **White Blood Corpuscles (Leucocyte)**

Reasons:

1. There are five different types of WBC.
- 2.. WBCs provides immunity against infection.



Result: The given slide is identified as **White Blood Corpuscles (Leucocyte)**

8. Identify the given slide with help of microscope and write the reasons with labeled diagram.

Aim: To identify the given slide with help of microscope and to write the reasons with labeled diagram.

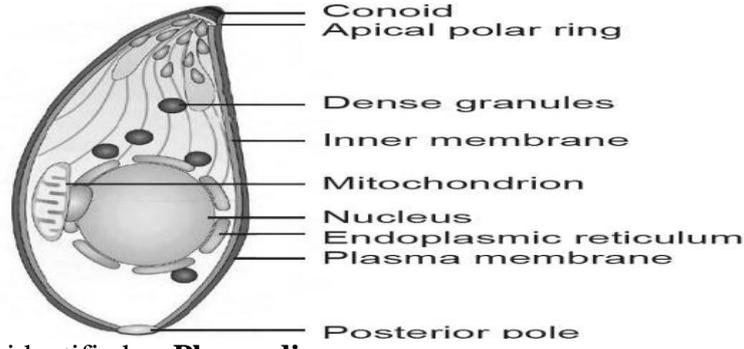
Identification:

The given slide is identified as **Plasmodium**

Reasons:

1. Plasmodium is a protozoan organism.
2. Plasmodium parasite causes Malaria.

Plasmodium



Result: The given slide is identified as **Plasmodium**

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9.Prepare a solution and identify the type of solution based on filtration

Aim:

To prepare a solution from the solid sample and identify the type of solution based on filtration.

Materials required :

Beaker, water, glass rod, filter papers, test tube, test tube stand, funnel and given solid sample.(sugar, chalk powder)

Note:

True solution - Homogenous and particles do not remain in the filter paper.

Suspension - Heterogeneous and particles remain in the filter paper.

Procedure:

Experiment	Observation	Inference
Take 50ml of water in a beaker. Add the given solid sample, into the beaker and stir the content gently with the help of glass rod. Filter the solution by using filter Paper.	Solute particles do not remain in the filter paper.	True solution.

Result:

The given solid sample forms **True Solution**

9.Prepare a solution and identify the type of solution based on filtration

Aim: To prepare a solution from the solid sample and identify the type of solution based on filtration.

Materials required :

Beaker, water, glass rod, filter papers, test tube, test tube stand, funnel and given solid sample.(sugar, chalk powder)

Note:

True solution - Homogenous and particles do not remain in the filter paper.

Suspension - Heterogeneous and particles remain in the filter paper.

Procedure:

Experiment	Observation	Inference
Take 50ml of water in a beaker. Add the given solid sample, into the beaker and stir the content gently with the help of glass rod. Filter the solution by using filter Paper.	Solute particles remain in the filter paper.	Suspension.

Result:

The given solid sample forms **Suspension**

10. Perform the following tests and identify whether the given sample is an acid or a base**Aim :**

To identify the presence of an acid or a base in a given sample..

Materials required: Test tubes, test tube stand, glass rod, phenolphthalein, methyl orange, sodium carbonate salt, zinc granules and the given sample.

Note:

S.No	Reactant	Reaction with acid	Reaction with base
1	Phenolphthalein	colourless	pink
2	Methyl orange	pink	yellow
3	Sodium carbonate	Brisk effervescence occurs	No Brisk effervescence
4	Zinc granules	Bubbles come out.	Bubbles do not come out.

Procedure:

S.No	Experiment	Observation	Inference
1	Phenolphthalein is added in drops to 5ml of test solution	No change in colour	Presence of acid.
2	Methyl orange is added in drops to 5ml of test solution	Turns pink in colour	Presence of acid.
3	A pinch of Sodium carbonate is added to 5ml of test solution	Brisk effervescence occurs	Presence of acid.
4	Little of zinc granules is added to 5ml of test solution	Bubbles come out.	Presence of acid.

Result:

The given test solution contains **Acid**

10. Perform the following tests and identify whether the given sample is an acid or a base**Aim :**

To identify the presence of an acid or a base in a given sample..

Materials required: Test tubes, test tube stand, glass rod, phenolphthalein, methyl orange, sodium carbonate salt, zinc granules and the given sample.

Note:

S.No	Reactant	Reaction with acid	Reaction with base
1	Phenolphthalein	colourless	pink
2	Methyl orange	pink	yellow
3	Sodium carbonate	Brisk effervescence occurs	No Brisk effervescence
4	Zinc granules	Bubbles come out.	Bubbles do not come out.

Procedure:

S.No	Experiment	Observation	Inference
1	Phenolphthalein is added in drops to 5ml of test solution	Turns pink in colour.	Presence of Base
2	Methyl orange is added in drops to 5ml of test solution	Turns yellow in colour.	Presence of Base
3	A pinch of Sodium carbonate is added to 5ml of test solution	No brisk effervescence occurs	Presence of Base
4	Little of zinc granules is added to 5ml of test solution	Bubbles do not come out.	Presence of Base

Result:

The given test solution contains **Base**

11. Identify if the samples are acids/ bases/neutral by using pH paper

Aim:

To identify the nature of the given solution by using pH paper

Materials required:

Sample solutions A&B, pH paper, glass rod and watch glass

Note :

PH < 7 acidic nature

PH > 7 Basic nature

PH = 7 neutral

Procedure:

Experiment	Test Sample	Observation		Inference Nature of solution
		Colour Produced	Approximate pH	
Add a drop of each sample on the pH paper and observe the colour change.	lemon juice (A)	Red	2	Acid
	Baking soda (B)	Blue	8	Base

Result:

1. The given sample A is **acid**
2. The given sample B is **base**

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12.Screw Gauge

Aim : To find out the thickness of the given one rupee coin.

Materials required:

Screw gauge, One rupee coin.

Formula :

$$\text{Least count} = \frac{\text{Pitch}}{\text{No. Of HSD}} \text{ (mm)}$$

$$\text{Thickness} = \text{P.S.R} + (\text{H.S.C} \times \text{L.C}) \pm \text{Z.C} \text{ (mm)}$$

Note:

No zero error - the zero of the head scale coincides with the pitch scale axis

Positive Zero Error- the zero of the head scale lies below the pitch scale axis

Negative Zero error - the zero of the head scale lies above the pitch scale axis

Procedure:

1. Find the least count and the zero error of the screw gauge.
2. Place the given coin firmly between two studs.
3. Note the pitch scale reading (PSR) and the head scale division (HSC).
4. Repeat the experiment for different positions of the coin.
5. Tabulate the readings. The average of the readings gives the thickness of the coin.

Table:

Pitch = 1mm L.C = 0.01mm Z.E = nil Z.C = nil

S.No.	P.S.R (mm)	H.S.C	H.S.C x L.C (mm)	Thickness of the coin = P.S.R + (H.S.C X L.C) ± Z.C (mm)
1	1	29	0.29	1.29
2	1	31	0.31	1.31
mean				1.30

Result: The thickness of the given coin = **1.30** mm**13.Ohm's Law Verification****Aim:** To determine the resistance of the given wire and to verify the Ohm's law.**Apparatus required:**

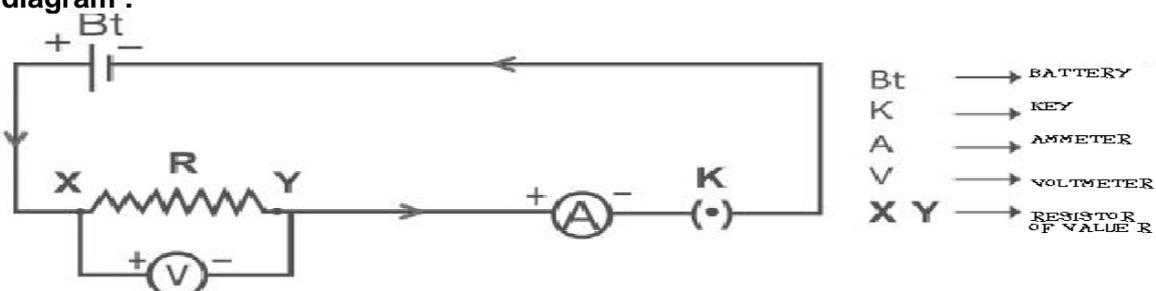
A resistor of unknown value, an ammeter (0-3 A), a voltmeter (0-10V), a battery eliminator, plug key and connecting wires.

Formula:

$$\text{Resistance of the wire } R = \frac{V}{I} \text{ ohms}$$

V - Potential difference in volt (V) volt

I - Current in ampere (A) ampere

Circuit diagram :**Procedure:**

1. Set up the circuit as shown in figure.
2. Note the readings of the ammeter and voltmeter when 2V Voltage is applied in the circuit.

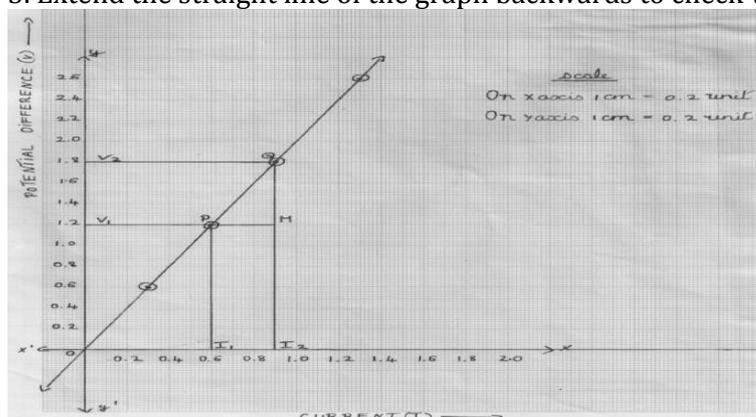
3. Repeat the experiment by varying the rating of the battery eliminator and record them.

Table

S. No.	Voltage applied in the circuit (in volt)	Current through the Resistor, I (in ampere)	Potential difference across the ends of the resistor V (in volt)	Resistance of the resistor $R=V/I$ (in ohm)
1	2	0.3	0.6	2
2	4	0.6	1.2	2
3	6	0.9	1.8	2
4	8	1.3	2.6	2
Mean				2

Graph: (1 Mark)

1. Draw the x and y axes with a suitable scale for I and V values and mark its value on the graph paper.
2. Join all the points and find the slope between two points P and Q on the graph paper which gives the resistance of the resistor used in the circuit.
3. Extend the straight line of the graph backwards to check whether it passes through the origin of the graph.



Result: (1 Mark)

1. Resistance R of the resistor obtained from the calculations = **2 ohm**.
2. Resistance R of the resistor obtained from the graph = **2 ohm**.
3. The graph between V and I is a straight line and passes through the origin. This verifies the Ohm's law.

14. Mapping of magnetic field

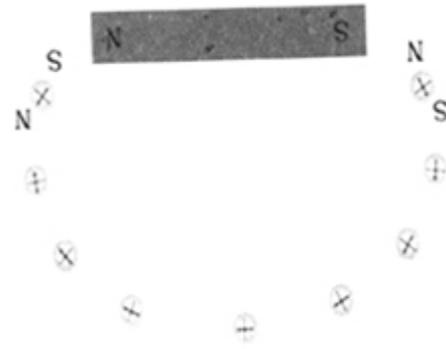
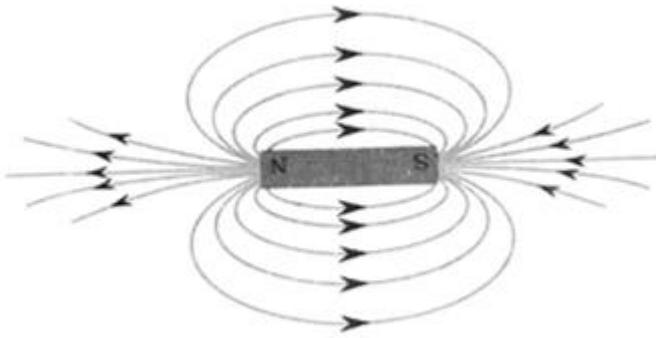
Aim:

To map the magnetic field due to a Bar Magnet placed in a Magnetic Meridian with its North-pole pointing towards North.

Apparatus required:

Compass Needle, sheets of white paper and Bar magnet.

Magnetic field

**Procedure:**

1. A bar magnet is placed on the magnetic meridian such that its north pole points towards geographic north.
2. Mark the positions of two ends of the needle as you move the compass needle from North Pole to South Pole.
3. The dots are joined as a smooth curve
4. Repeat the above procedure and draw as many lines as you can
- 5 Drawn curved lines represent the direction and the magnetic field of the magnet

Result:

The magnetic lines of force are mapped when the bar magnet is placed with its North Pole facing geographic north. The mapped sheet is attached

15 .Focal length of convex lens

Aim:

To determine the focal length of the given convex lens by

1. distance object method
2. u-v method

Materials required :

Convex lens, lens stand, white screen, meter scale, and illuminated wire gauze.

Formula :

Focal length of the convex lens by u-v method

$$f = \frac{UV}{U+V} \text{ cm}$$

u - is the distance between the lens and the object cm

v - is the distance between the lens and the image. cm

Procedure:

Distant object method:

1. The convex lens is mounted on the stand and is kept facing a distant object
2. The position of the white screen and the convex lens is adjusted to get a clear, diminished and inverted image of the object
3. The distance between the convex lens and the screen is measured which gives the focal length of the convex lens (f).

u v method:

1. Convex lens mounted on a stand is placed in front of the illuminated wire gauze at a certain distance.
2. Four values of 'u' are chosen such that the two values of 'u' less than 2f and the other two values of 'u' greater than 2f.
3. The screen is adjusted to get a clear image.
4. The distance between the lens and the screen is taken as 'v' and it is measured for each experimental value of 'u'
5. Tabulate the readings. The average of the readings gives focal length of the convex lens by u-v method

Table :

S.No	Nature of image	Object distance 'u' cm	Image distance 'v'cm	Focal length $f = \frac{UV}{U+V}$ cm
1	u < 2f(magnified)	30	60	20
2	u < 2f(magnified)	35	46	20
3	u > 2f(diminished)	45	36	20
4	u > 2fdiminished	50	33	20
Mean				20

Result:

The focal length of the given convex lens by

i. Distance object method (f) = **20 cm**

ii.U-V Method (f) = **20 cm**

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