GRADE X

SSLC

RECORD NOTEBOOK

SUBJECT : Science.

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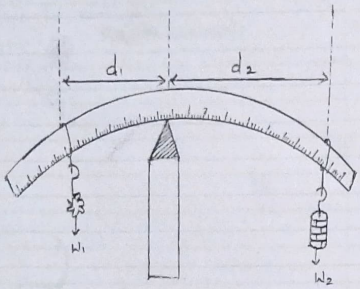
PHYSICS



Observation :

S.No	Weight In Weight Hanger W_2 (kg)	Distance of Known Weight d_1 (m)	Distance of Unknown Weight d_2 (m)	$W_2 \times d_2$ kg (m)	Unknown Weight $W_1 = \frac{W_2 \times d_2}{d_1}$ (kg)
1.	0.05	0.11	0.1	0.005	0.45
2.	0.1	0.20	0.1	0.01	0.05
3.	0.15	0.29	0.1	0.015	0.052
				Mean	0.049 kg

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Determination Of Weight Of An Object Using The Principle Of Moments

Aim :

To determine the weight of an object using the principle of moments.

Apparatus Required :

A metre scale, a knife edge, slotted weights, thread.

Procedure :

i. A metre scale is supported at its centre of gravity by a knife edge or suspended by using a thread tied to its centre so that the scale is in the horizontal position. Ensure that the scale is in equilibrium position.

ii. A known weight W_2 and an unknown weight W_1 are suspended from to either side of the scale using the weight hangers.

iii. Fix the position of one weight hanger and adjust the position of the second weight hanger such that the scale is in equilibrium.

iv. Measure the distance d_1 and d_2 of the two weight hangers from the centre of the scale accurately.

v. The experiment is repeated for different positions of the Unknown weight. Measure the distances.

CALCULATIONS:

Moment of a force can be calculated using the formula.

Moment of the force = Force × Distance.

Anticlockwise moment by unknown weight = $W_1 \times d_1$

Clockwise moment by known weight = $W_2 \times d_2$

$W_1 \times d_1 = W_2 \times d_2$

Unknown Weight = $W_1 = \frac{W_2 \times d_2}{d_1}$

i) $W_2 \times d_2$ $= 0.05 \times 0.1$ $= 0.005$	i) $\frac{W_2 \times d_2}{d_2}$ $= \frac{0.005}{0.11} = 0.45$
ii) $0.1 \times 0.1 = 0.01$	ii) $\frac{0.01}{0.20} = 0.05$
iii) $0.15 \times 0.1 = 0.015$	iii) $\frac{0.015}{0.29} = 0.052$

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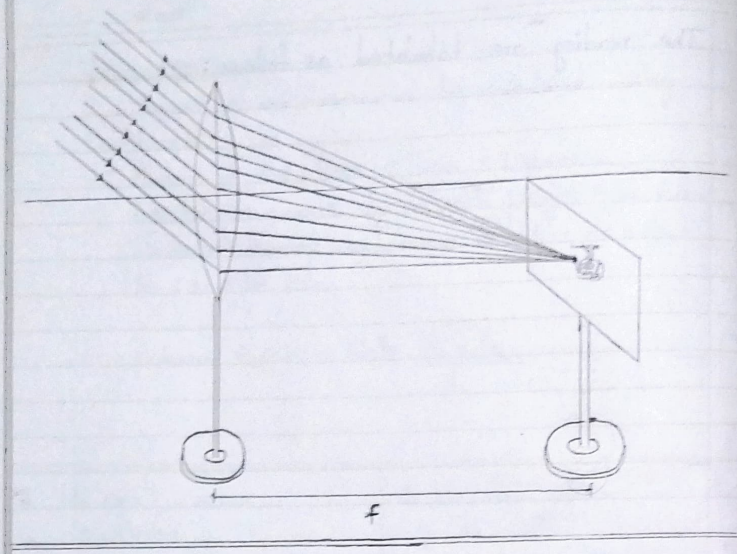
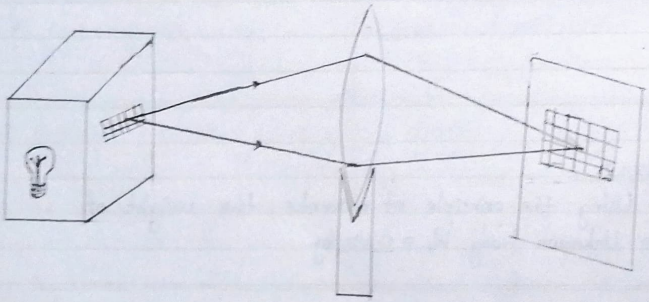
The reading are tabulated as follows:

RESULT:

Using the principle of moments, the weight of the Unknown body $W_1 = 0.491$ kg





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Determination Of Focal Length Of A Convex Lens

Aim:

To determine the focal length of a convex lens by using

1. Distant object method.
2. uv method.

Apparatus Required: A convex lens, stand, wire gauze object, screen and measuring scale.

Formula:

$$F = \frac{uv}{(u+v)}$$

Here,

U is the distance between the object (light source) and the convex lens.

V is the distance of the image (screen) from the convex lens.

F is the focal length of the convex lens.

1. Distant Object method:

Fix the given convex lens vertically on the stand and place it on the table near an open window of the laboratory. Locate a distant object (tree or building) through the open window. Place the screen behind the convex lens. Adjust the position of the convex lens and the screen so as to get a sharp,

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OBSERVATION:

Focal length of the convex lens (By distance object method) is (F) = 10 cm

2f = 20 cm

S.No	Size of the image	Position of the object	Distance between the object and the lens (u) cm	Distance between the screen and the lens (v) cm	Focal length of convex lens $f = \frac{uv}{(u+v)}$ cm
1	Diminished	u > 2f	24	19	10.60
2			23	18	10.09
3	Same size	u = 2f	20	27	11.48
4	Magnified	u < 2f	19	23	10.40
5.			18	24	10.28

i) $\frac{uv}{u+v}$

$\frac{24 \times 19}{24+19} = \frac{456}{43} = 10.60$

ii) $\frac{23 \times 18}{23+18} = \frac{414}{41} = 10.09$

iii) $\frac{20 \times 27}{20+27} = \frac{540}{47} = 11.48$

Mean = 10.57 cm

iv) $\frac{19 \times 23}{19+23} = \frac{437}{42} = 10.40$

v) $\frac{18 \times 24}{18+24} = \frac{432}{42} = 10.28$

inverted and diminished image. Measure the distance between the screen and the convex lens with the help of the measuring scale. This distance is equal to the approximate focal length of the convex lens (f)

2. uv - Method :

Fix the given convex lens vertically on the stand and place it on the table. Place the wire gauze object on the left side of the convex lens (say at a distance greater than 2f). Measure the distance between the object and the lens (u). Place the screen on the right side of the convex lens and adjust its position to get a sharp, inverted and diminished image. Measure the distance between the screen and the lens (v). Repeat the same procedure, by changing the distance of the object (u) and tabulate your observations.

RESULT:

The focal length of the given convex lens.

1. By distance object method f = 10 cm
2. By 'uv method f = 10.57 cm

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Determination Of Resistivity

Objective :

To determine the resistivity of the material of the given coil of wire.

Equipment Required :

A coil of wire, screw guage, a metre scale, battery, key, ammeter, voltmeter, rheostat and connecting wires.

Formula :

The resistivity of the material of the coil of wire is

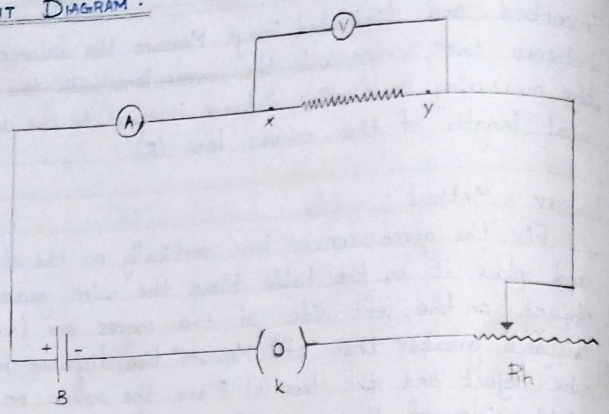
$$\rho = \left(\frac{A}{L}\right) R \text{ (in ohm metre)}$$

Where A is the area of cross section of the wire (m^2)
L is the length of the coil of wire (m)
R is the resistance of the coil of wire (ohm)

Procedure :

- Connect the battery, ammeter, given wire, rheostat and key in series, as shown in the circuit diagram.
- Connect the voltmeter in parallel to the unknown resistor.
- Close the key and hence the circuit is closed.
- Adjust the rheostat such that ammeter read a current of 0.5 ampere.
- Note down the potential difference across the resistor as shown by the voltmeter.
- Adjust the rheostat and change the current in

Circuit Diagram :



Observation :

(i) To Find The Resistance :

S.No	Ammeter Reading - I (Ampere)	Voltmeter Reading - V (Volt)	Resistance = V/I (Ohm)
1.	1	1.7	1.7
2.	1.5	2.7	1.8
3.	2	3.6	1.8
		Mean	1.76 Ω

(ii) To Find The Diameter Of The Wire Using Screw Gauge

S.No	Pitch Scale reading - PSR (mm)	Head scale coincidence - HSC	Head scale reading - HSR = HSC x LC (mm)	Total reading = PSR + HSR (mm)
1.	1	21	0.21	1.21
2.	1	19	0.19	1.19
3	1	18	0.18	1.18
		Mean Diameter		0.00193 m.

Calculations:

Radius of the wire, r = diameter/2 = 0.000596 m

Area of cross section of the wire, $A = \pi r^2 = 0.0000011538\ m^2$

Length of the wire L = 1 m

Resistivity of the material of the wire = $\rho = \left(\frac{A}{L}\right) R = 1.96 \times 10^{-6}\ \Omega m$

$A = \pi r^2$

$= 3.14 \times 0.000596 \times 0.000596$

$= 0.0000011538\ m^2$

$r = \frac{d}{2}$

$r = \frac{0.00193}{2}$

$r = 0.000596\ m$

$\rho = \left(\frac{A}{L}\right) R$

$= \frac{0.0000011538}{1} \times 1.76$

$= 0.0000019307$

$= 1.96 \times 10^{-6}$

steps of 0.5A (that is 0.5A, 1.0A, 1.5A, etc.).

- For each current, note down the corresponding potential difference as shown by the voltmeter.
- Tabulate the observations.
- Measure the diameter of the wire using a screw guage.
- Measure the length of the coil using metre scale.

Result:

The resistivity of the material of the wire = $1.96 \times 10^{-6}\ \Omega m$.

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CHEMISTRY

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Identify The Dissolution Of The Given Salt Whether It Is Exothermic Or Endothermic

Aim:

To test the dissolution of given salt is exothermic or endothermic.

Principle:

If the reaction or process liberates the heat, then it is called exothermic.

If the reaction or process absorbs the heat, then it is called endothermic.

Apparatus Required:

Two beakers, Thermometer, stirrer, weighed amount of two samples.

Procedure:

Take 50ml of water in two beakers and label them as A and B. Note the temperature of the water from beaker A and B. Then, add 5g of sample A into the beaker A and stir well until it dissolve completely. Record Final temperature of the solution. Now, repeat the same for the sample B. Record the observation.

Observation :

S.No	Sample	Temperature before addition of sample (°C)	Temperature after addition of sample (°C)	Inference (temperature increases or decreases)
1	A	30° C	67°C	Temperature increases
2	B	30° C	28°C	Temperature decreases

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NOTE :

Sodium hydroxide, ammonium nitrate, glucose, calcium oxide etc. may be given as the same sample.

RESULT :

From the inferences made

The dissolution of sample A is exothermic.

The dissolution of sample B is endothermic.

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Testing The Solubility Of The Salt

Observation :

S.No	Amount of salt added	Observation [Salt dissolved/undissolved]	Inference [unsaturated/ saturated/super saturated]
1	25 gms	Salt dissolves	Unsaturated
2	25 + 1 = 36 gms	Salt dissolves	Saturated
3	36 + 1 = 37 gms	Undissolved	Super saturated

Aim :

To test the given solubility of the salt based on the saturation and unsaturation of the solution at a given temperature.

Principle :

A solution in which no more solute can be dissolved in the solvent at a given temperature is called saturated solution. If the solvent can dissolve more solute than what is present, the solution is called unsaturated solution.

Materials Required :

A 250 ml of beaker, a stirrer, sufficient quantity of distilled water, 100 ml measuring jar, table salt in three packets weighing as 25g, 11g and 1g.

Procedure :

In a 250 ml beaker, pour 100ml water using measuring jar. To this water add table salt (25g) from first packet. Stir the content very well. Add the next packet containing 11g salt followed by constant stirring. Now add the third packet containing 1g salt. Record your observation.

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RESULT : From the above observation, it is inferred that the amount of salt required for saturation is 36 g

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Testing The Water Of Hydration Of Salt

Aim :

To check whether the given sample of salt possesses 'water of Hydration' or not. To verify the presence of water in the given hydrated salt.

Principle :

Water of crystallization or water of hydration is the phenomenon shown by certain salts in which water molecules are present inside the crystals are responsible for their colour and geometry.
e.g. crystalline copper sulphate $CuSO_4 \cdot 5H_2O$

Materials Required :

A pinch of crystalline copper sulphate in a test tube, tongs, spirit lamp.

Procedure :

A pinch of crystalline copper sulphate taken in a test tube and heated for sometime. Water droplets are seen on the inner walls of the test tube. This shows that the given salt contains water of crystallization. If the above observation is not noticed for the given salt, the water of hydration is absent.

Solution :

$$CuSO_4.5H_2O \underset{\text{Cooling}}{\overset{\text{Heating}}{\rightleftharpoons}} CuSO_4 + 5H_2O$$

Blue colour — Colourless

Molecular mass of $CuSO_4$		Molecular mass of $5H_2O$	
Cu	= 63.55	H_2	= 2 × 1
S	= 32.07		= 2
O	= 16 (∴ 16 × 4)	O	= 16
	= 64	Total	= 2 + 16
Total	= 63.55 + 32.07 + 64	H_2O	= 18
	= 159.62	$5H_2O$	= 5 × 18 = 90

Molecular mass of $CuSO_4.5H_2O$

= 159.62 + 90 = 249.72

$$\text{Mass \% of water} = \frac{\text{molecular mass of water}}{\text{molecular mass of } CuSO_4} \times 100$$

$$= \frac{90}{249.72} \times 100 = 36.08\ \%$$

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RESULT :

In the given sample of salt, water of crystallization hydration is present

A) Present ✓

B) Absent

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Test The Given Sample For The Presence Of Acid Or Base

Aim:

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

Materials Required:

Test tubes, test tube stand, glass rod, phenolpthalein, methyl orange, sodium carbonate salt and the given sample.

Principle:

In acid medium,

(a) Phenolpthalein is colourless
(b) Methyl orange is pink in colour
(c) Sodium carbonate gives brisk effervescence.

Procedure:

S.No	Experiment	Observation (Colour change)	Inference (Acid)
1.	Take 5ml of the test solution in a test tube and a few drop of phenolptalein in it.	No change in colour.	Presence of acid.
2.	Take 5ml of the test solution in a test tube and a few drops of methyl orangle on it.	Solution turn pink in colour.	Presence of acid.
3.	Take 5ml of the test solution in a test tube and add a pinch of sodium carbonate salt.	Brisk effervescence occurs.	Presence of acid.

Result: The given test solution contains Acid.

PROCEDURE :

S.No	EXPERIMENT	OBSERVATION (Colour Change)	INFERENCE (Base)
1.	Take 5ml of the test solution in a test tube and add a few drops of Phenolphthalein in it.	Solution turns pink in colour.	Presence of base.
2.	Take 5ml of test solution in a test tube and add few drops of Methyl orange on it.	Solution turns yellow in colour.	Presence of base.
3.	Take 5ml of the test solution in a test tube and add a pinch of sodium carbonate salt.	No brisk effervescence.	Presence of base.

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PRINCIPLE :

In Base medium,

(a) Phenolpthelein is pink in colour.

(b) Methyl orange is yellow in colour.

(c) Sodium carbonate does not give bisk effervescence.

RESULT : The given test solutions contain base.

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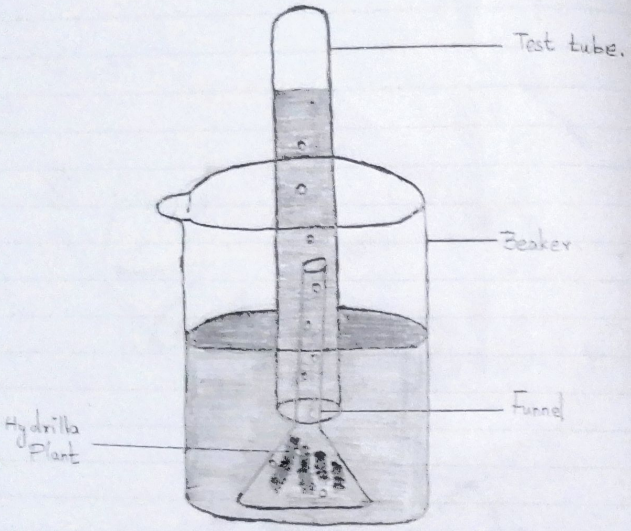
BIO-BOTANY



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Photosynthesis - Test Tube And Funnel Experiment (Demonstration)

Aim:

To prove that oxygen is evolved during photosynthesis.

Materials Required:

Test tube, funnel, beaker, pond water and Hydrilla plant.

Procedure:

1. Take few twigs of Hydrilla plant in a beaker containing pond water.
2. Place an inverted funnel over the plant.
3. Invert a test tube filled with water over the stem of the funnel.
4. Keep the apparatus in the sunlight for few hours.

Observation:

After one hour, it is noted water get displaced down from the test tube.

Inference:

During photosynthesis, oxygen is evolved as a by-product. Gas bubbles liberated from the Hydrilla plant reach the top of the test tube and it displaces the water downwards. Take the test

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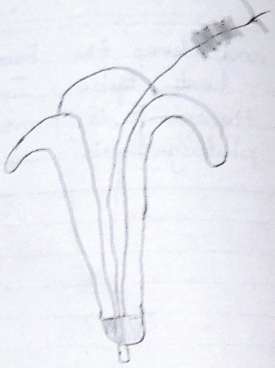
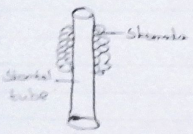
tube and keep the burning stick near the mouth of the test tube. Increased flame will appear. Hence, it is proved that oxygen is evolved during photosynthesis.

OBSERVATION :

A TWIG

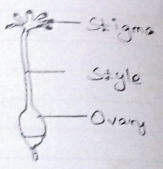


L.S OF A FLOWER

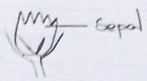


ANDROECIUM

A STAMEN



GYNOECIUM



CALYX

A PETAL

PARTS OF THE FLOWER

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PARTS OF A FLOWER

AIM :

To dissect and display the parts of the given flower and observe the Calyx, Corolla, Androecium and Gynoecium. Draw labelled sketches.

MATERIALS REQUIRED :

Flower, needle and paper.

PROCEDURE :

With the help of the needle dissect the different whorls of the flowers

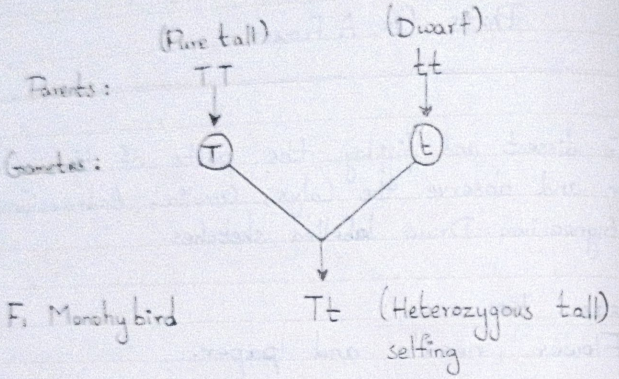
Floral Parts :

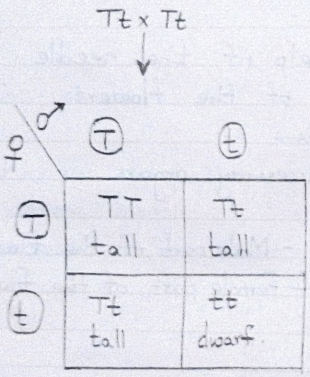
Calyx } Accessory organ.
Corolla }

Androecium - Male part of the flower } Reproductive organ
Gynoecium - Female part of the flower }

OBSERVATION :

Draw and label the parts of the flower.





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MENDEL'S MONOHYBRID CROSS

AIM :

To study the monohybrid cross by using model / picture / photograph. To find out the phenotypic ratio and genotypic ratio in pea plant using checker board.

Note : Depict parental generation and the gamets using colour chalk pieces.

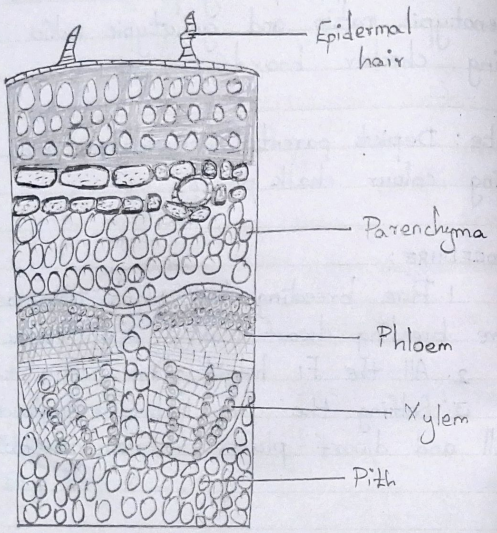
PROCEDURE :

1. Pure breeding tall plant is crossed with pure breeding dwarf plant.
2. All the F_1 hybrid plants were tall (Tt)
3. Selfing the F_1 hybrid plants resulted in tall and dwarf plants in F_2 generation.

RESULT :

Phenotypic ratio = Tall - 3 : Dwarf - 1

Genotypic ratio = Pure Tall - 1 : Hybird Tall - 2 : Pure Dwarf - 1



DICOT STEM

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OBSERVATION OF TRANSVERSE SECTION OF DICOT STEM AND DICOT ROOT

AIM:

To observe transverse section (T.S) of Dicot Stem/ Dicot Root from permanent slides.

OBSERVATION:

A. The given slide is identified as T.S of Dicot Stem.

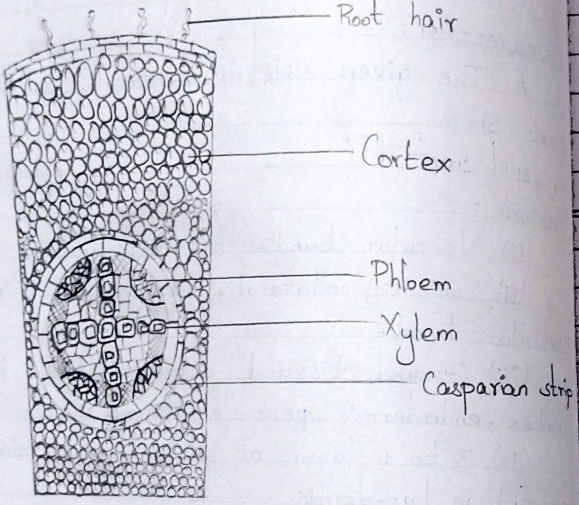
REASONS:

(i) Vascular bundles are arranged in a ring.

(ii) Conjoint, collateral, endarch and open vascular bundle.

(iii) Ground tissued differentiated into cortex, endodermis, pericycle and pith.

(iv) 3 to 6 layer of collenchymas tissues present in hypodermis.



DICOT ROOT

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OBSERVATION:

B. The given slide is identified as T.S of Dicot Root.

REASONS:

(i) Vascular bundle are radial.
(ii) Xylem is enarch and Tetrach.
(iii) Casparian strips and passage cells are present in endodermis.
(iv) Cortex is made up of parenchymatous cells.

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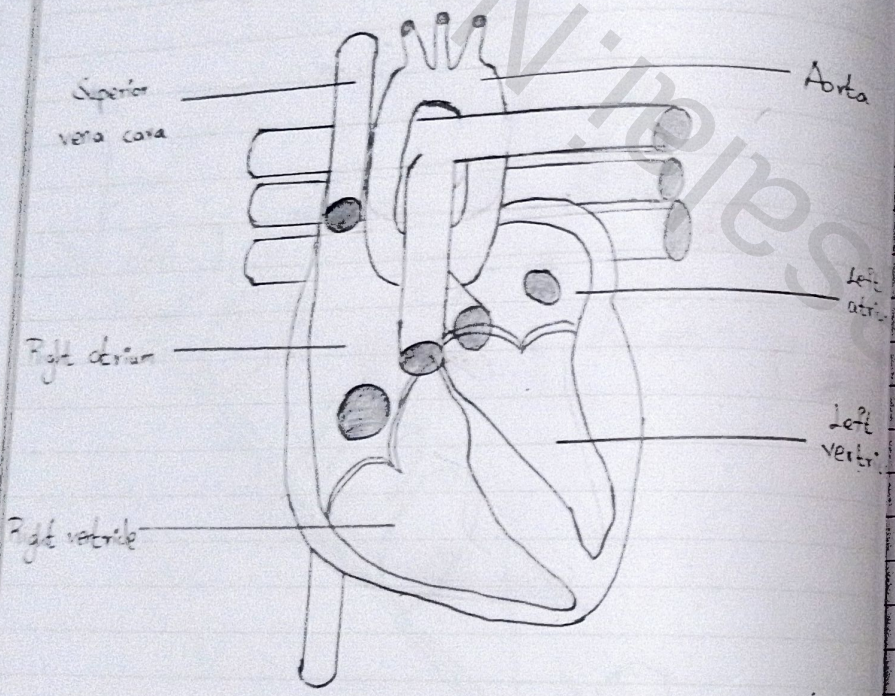

HUMAN HEART

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OBSERVATION OF MODELS - HUMAM HEART AND HUMAN BRAIN

IDENTIFICATION OF LONGITUDINAL SECTION (L.S) OF THE HUMAN HEART

AIM:

To observe and draw a labelled sketch of L.S of human heart and describe the structure.

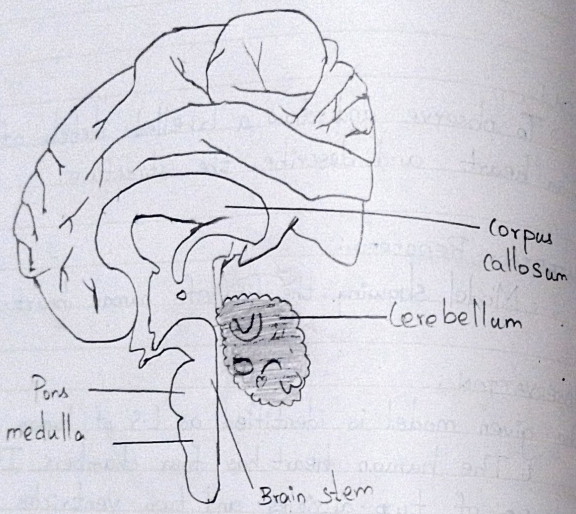
MATERIALS REQUIRED:

Model showing the L.S of human heart.

OBSERVATION:

The given model is identified as L.S of human heart.

1. The human heart has four chambers. It is made up of two auricles and two ventricles.
2. The auricles are seperated by interauricular septum and ventricles are seperated by interventricular septum. It prevents the mixing of oxygenated and deoxygenated blood.
3. Tricuspid valve - It is located between the right auricle and right ventricle.
4. Bicuspid valve - It is located between the left auricle and left ventricle.
5. The heart is covered by a protective double walled membrane called pericardium.
6. The heart pumps blood to all parts of the body.



HUMAN BRAIN

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IDENTIFICATION OF L.S OF THE HUMAN BRAIN.

AIM:

To observe and draw a labelled sketch of L.S of human brain and comment on it.

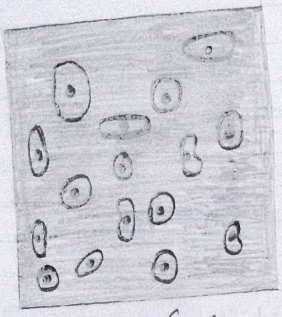
MATERIALS REQUIRED:

Model showing the L.S of human brain.

IDENTIFICATION:

The given model is identified as L.S of human brain

1. The brain is enclosed in the cranial cavity.
2. It is controlling centre of all the body activities.
3. It is covered by three connective tissue membrane or meninges : Duramater Arachnoid membrane and Piamater.
4. The human Brain is divided into three parts namely forebrain, midbrain and hindbrain



Red Blood Cells

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Identification of Blood Cells.

Aim:

Identification of blood cells (Red blood cells and white blood cells). To draw a neat labelled diagram and write a note on the blood cells identified.

Materials Required:

Permanent prepared slides of blood cells.

Identification:

The given slide is identified as Red blood cells.

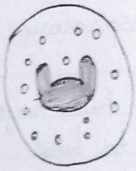
1. They are biconcave and disc shaped.
2. They are also known as erythrocytes.
3. Mature mammalian RBC's do not have nucleus.
4. Haemoglobin is a respiratory pigment which gives red colour.
5. It transports oxygen from lungs to tissues and carbon-dioxide from tissues to lungs.

MONOCYTE

LYMPHOCYTE

NEUTROPHIL

EOSINOPHIL



BASOPHIL

WHITE BLOOD CELLS

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IDENTIFICATION:

The given slide is identified as white blood cells.

1. WBC's are colourless and they have nucleus.
2. They are also known as leucocytes.
3. They show amoeboid movements.
4. They fight against germs and other foreign bodies and thus protect the body from microbial infections and diseases.
5. There are five different types of WBC namely Neutrophils, Eosinophills, Basophils, Lymphocytes and monocytes.

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Identification Of Endocrine Gland

Aim:

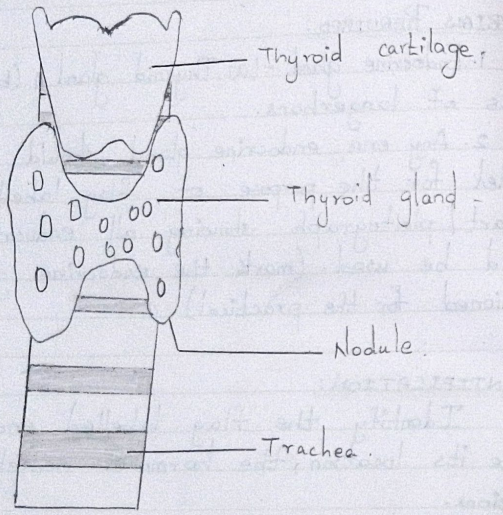
To identify the endocrine gland, its location, hormone secreted and functions - Thyroid gland.

Materials Required:

1. Endocrine gland - (a) Thyroid gland (b) pancreas - Islets of langerhans.
2. Any one endocrine gland should Flag labelled for the purpose of flag labelling a model/ a chart/ photograph showing all endocrine glands should be used. (mark the endocrine glands mentioned for the practical).

Identification:

Identify the flag labelled endocrine gland. Write its location, the hormones secreted and its functions.



THYROID GLAND

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(a) Thyroid gland

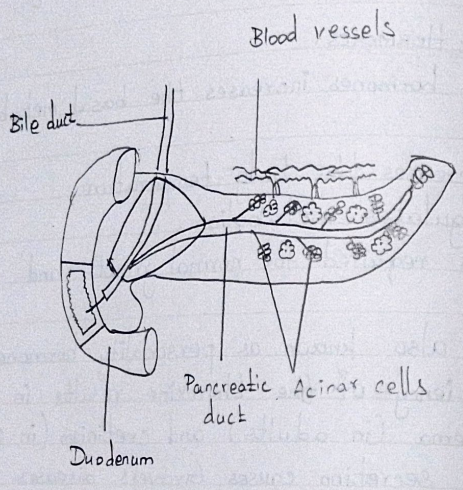
IDENTIFICATION : The flag labelled endocrine gland is identified as Thyroid gland.

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

HORMONES SECRETED : Triiodothyronine (T_3) and Thyroxine (T_4)

FUNCTIONS OF HORMONES:

1. Thyroid hormones increases the basal metabolic rate (BMR)
2. It increases the body temperature.
3. It regulates metabolism.
4. It is required for normal growth and development.
5. It is also known as personality hormone.
6. Deficiency of the thyroxine results in simple goitre, myoxdema (in adults) and cretinism (in children)
7. Excess secretion causes Graves diseases.



PANCREAS

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(b) PANCREAS - ISLETS OF LANGERHANS

IDENTIFICATION:

The Flag labelled endocrine gland is identified as Islets of Langerhans in the pancreas.

LOCATION:

Islets of langerhangs are seen embedded in the pancreas which is located in the abdominal region.

HORMONES SECRETED:

1. α cells secrete glucagon.
2. β cells secrete insulin.

FUNCTIONS OF HORMONES:

1. Insulin converts glucose and stores it in liver and muscels.
2. Glucagon converts glycogen into glucose.
3. Insulin and glycogen maintain the blood sugar, level (80-120 mg/dl) by their antagonistic function.
4. Decreases in insulin secreation causes diabetes mellitus.