SCIENCE PRACTICAL

10 TH STANDARD

SET - A

1. DETERMINATION OF WEIGHT OF AN OBJECT USING THE PRINCIPLE OF MOMENTS **(PHYSICS)**

6. TESTING THE WATER OF HYDRATION OF SALT **(CHEMISTRY)**

8. PHOTOSYNTHESIS – TEST TUBE AND FUNNEL EXPERIMENT **(BIO – BOTANY)**

13. IDENTIFICAION OF BLOOD CELLS **(BIO-ZOOLOGY)**

SET – B

2. DETERMINATION OF FOCAL LENGTH OF A CONVEX LENS **(PHYSICS)**

5. TESTING THE SOLUBILITY OF THE SALT **(CHEMISTRY)**

10. TO STUDY THE LAW OF DOMINANCE **(BIO – BOTANY)**

12. IDENTIFICATION OF MODELS – HUMAN HEART AND HUMAN BRAIN **(BIO-ZOOLOGY)**

SET – C

1. DETERMINATION OF WEIGHT OF AN OBJECT USING THE PRINCIPLE OF MOMENTS **(PHYSICS)**

4. IDENTIFY THE DISSOLUTION OF GIVEN SALT WHETHER IT IS EXOTHERMIC OR ENDOTHERMIC **(CHEMISTRY)**

9. PARTS OF FLOWER **(BIO – BOTANY)**

13. IDENTIFICAION OF BLOOD CELLS **(BIO-ZOOLOGY)**

SET – D

3. DETERMINATION OF RESISTIVITY **(PHYSICS)**

7.TEST THE GIVEN SAMPLE FOR THE PRESENCE OF ACID OR BASE **(CHEMISTRY)**

11. OBSERVATION OF TRANSVESE SECTION OF DICOT STEM AND DICOT ROOT **(BIO – BOTANY)**

14. IDENTIFICATION OF ENDOCRINE GLANDS **(BIO-ZOOLOGY)**

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PHYSICS

1. 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 and thread

Principle:

Clock wise moment ($W_1 \times d_1$) = Anticlockwise moment ($W_2 \times d_2$)

Formula:

$$W_1 = \frac{W_2 x d_2}{d_1} \text{ N}$$

W1 – Unknown weight

W2 – Known weight

d1 – Distance of unknown weight

d2 – Distance of known weight

Procedure:

- A metre scale is supported at its centre of gravity by a knife edge and ensure that the scale is in equilibrium position.
- A known weight W2 and unknown weight W1 are suspended from to either side of the scale using the weight hangers.
- Fix the position of one weight hanger and adjust the position of the second weight hanger such that the scale is in equilibrium.
- Measure the distance d1 and d2 of the two weight hangers.
- The experiment is repeated for the different positions of the unknown weight. Measure the distances. The reading is tabulated as follows.

Observation:

S. No	Known weight W_2 (N)	Distance of known weight d_2 ($x10^{-2}$ m)	Distance of unknown weight d_1 ($x10^{-2}$ m)	$W_2 x d_2$ ($x10^{-2}$Nm)	Unknown weight $W_1 = \frac{W_2 x d_2}{d_1}$ (N)
1	1	15	12	15	1.25
2	1	20	16	20	1.25
				Mean	1.25

Result:

Using the principle of moments, the weight of the unknown body W_1 = **1.25** N

CHEMISTRY

6. TESTING THE WATER OF HYDRATION OF SALT

Aim:

To check whether the given sample of salt possesses "Water of Hydration" or not.

Materials required:

Crystalline copper sulphate salt, test tube, tongs and spirit lamp

Principle:

- Some salts crystallize with water molecules. This is called hydrated salt.

Procedure:

S. No	Experiment	Observation	Inference
1	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	The water of hydration is present

Result:

In the given sample of salt water of hydration is **present**

OR

Aim:

To check whether the given sample of salt possesses "Water of Hydration" or not.

Materials required:

Crystalline copper sulphate salt, test tube, tongs and spirit lamp

Principle:

- Some salts crystallize with water molecules. This is called hydrated salt.

Procedure:

S. No	Experiment	Observation	Inference
1	A pinch of crystalline copper sulphate taken in a test tube and heated for sometime	Water droplets are not seen on the inner walls of the test tube	The water of hydration is absent

Result:

In the given sample of salt water of hydration is **absent**

BIO – BOTANY

8. PHOTOSYNTHESIS – TEST TUBE AND FUNNEL EXPERIMENT

Aim:

To prove that oxygen is evolved during photosynthesis

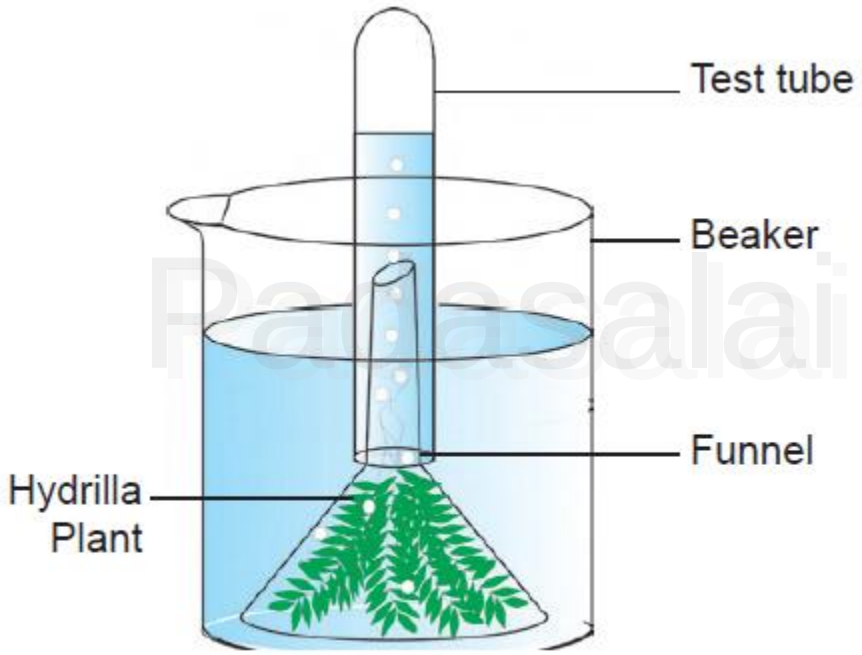
Materials required:

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

Procedure:

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

Diagram:



Observation:

It is noted that water gets displaced down from the test tube.

Inference:

Take the test tube and keep the burning stick near the mouth of the test tube. Increased the flame will appear.

Result:

This test proves that oxygen is released during photosynthesis.

BIO-ZOOLOGY

13. IDENTIFICAION OF BLOOD CELLS

Aim:

To identify the given slides, draw a labelled diagram and write a note on it.

Material required:

Permanent slides of blood cells and Microscope

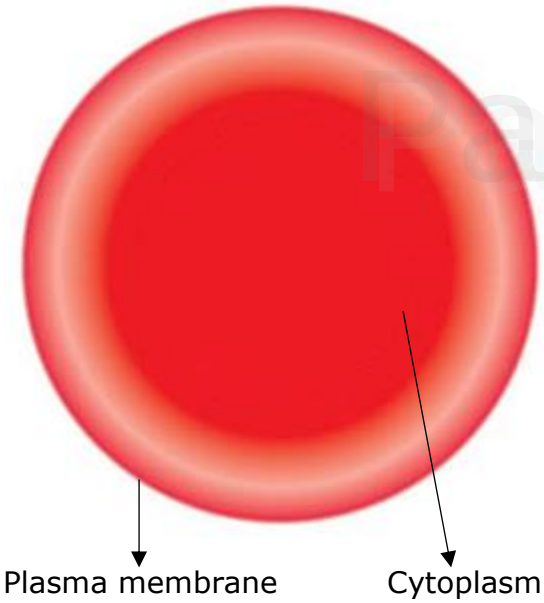
Identification:

The given slide is identified as Red Blood Cell

Notes:

- They are biconcave and disc shaped
- Mature mammalian RBC's do not have nucleus
- Haemoglobin is a respiratory pigment which gives red colour

Diagram:



Result:

The given slide was identified as the Red Blood Cell.

OR

Aim:

To identify the given slides, draw a labelled diagram and write a note on it.

Material required:

Permanent slides of blood cells and Microscope

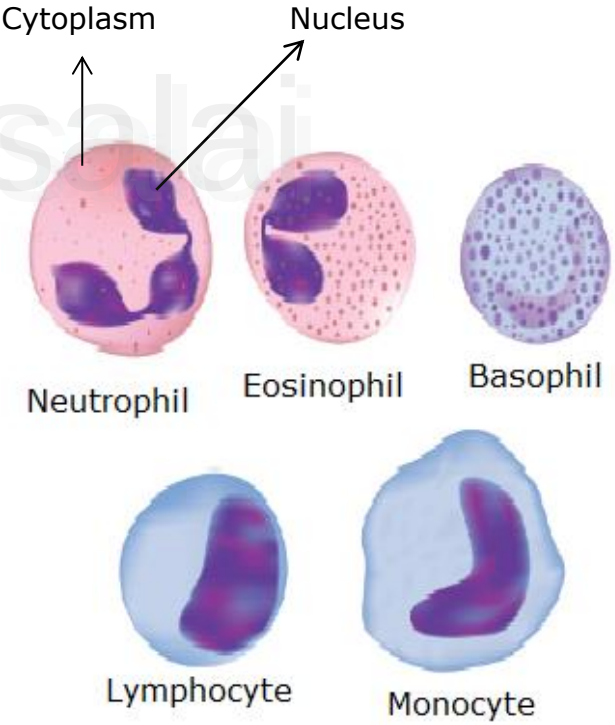
Identification:

The given slide is identified as White Blood Cell

Notes:

- They are colourless and they have amoeboid shaped.
- They have nucleus.
- They protect the body from diseases.

Diagram:



Result:

The given slide was identified as the White Blood Cell.

PHYSICS

2. 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. u-v method

Apparatus required:

A convex lens, stand, wire gauze object, screen and measuring scale

Formula:

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

f – focal length of convex lens
u – distance between the object and the lens
v – distance between the image and the lens

Procedure:

1. Distance object method:

Fix the given lens to the stand and place the screen behind the lens. Move the lens back and forth to capture the clear image of the object. Measure the distance between lens and screen. This is focal length (f) of the convex lens.

2. u-v method:

Fix the lens into the stand and place the wire gauze object at the specified distance to the left side of the lens. Measure the distance between the lens and the object (u). place the screen on the right side of the lens and capture the clear image on the screen. Measure the distance between the lens and the image (v). Repeat the same procedure by changing 'u' and tabulate the observations.

Observation:

Focal length of the convex lens (by distance object method) is (f) = 10.5 cm

(2f) = 21 cm

S. No	Position of the object	Distance of the Object (cm)	Distance of the Image (cm)	Focal length of the convex lens $f = \frac{uv}{(u+v)}$ cm
1	u>2f	23	19.5	10.55
2	u=2f	21	21	10.50
3	u<2f	19	24	10.60
			Mean	10.55

Result:

The focal length of the given convex lens

1. By distance object method f = **10.50** cm

2. By u-v method f = **10.55** cm

CHEMISTRY

5. TESTING THE SOLUBILITY OF THE SALT

Aim:

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

Materials required:

A 250 ml beaker, 100 ml measuring jar, a stirrer, distilled water and salt (25 g, 11 g, and 1g)

Principle:

- A solution in which more solute can be dissolved in the solvent at a given temperature is called unsaturated solution
- A solution in which no more solute can be dissolved in the solvent at a given temperature is called saturated solution

Procedure:

- In a 250 ml beaker pour 100 ml water using measuring jar. To this water add 25 g salt from the first packet. stir the content very well.
- Add the next packet containing 11 g salt followed by constant stirring.
- Now add third packet containing 1 g salt. Record the observations.

Observation:

S. No	Amount of salt added (g)	Observation (Dissolved/ Undissolved)	Inference (Unsaturated/ / Super saturated)
1	25	Dissolved	Unsaturated Saturated
2	36 (25 + 11)	Dissolved	Saturated
3	37 (25 + 11 + 1)	Undissolved	Super saturated

Result:

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

BIO-BOTANY

10. TO STUDY THE LAW OF DOMINANCE

Aim:

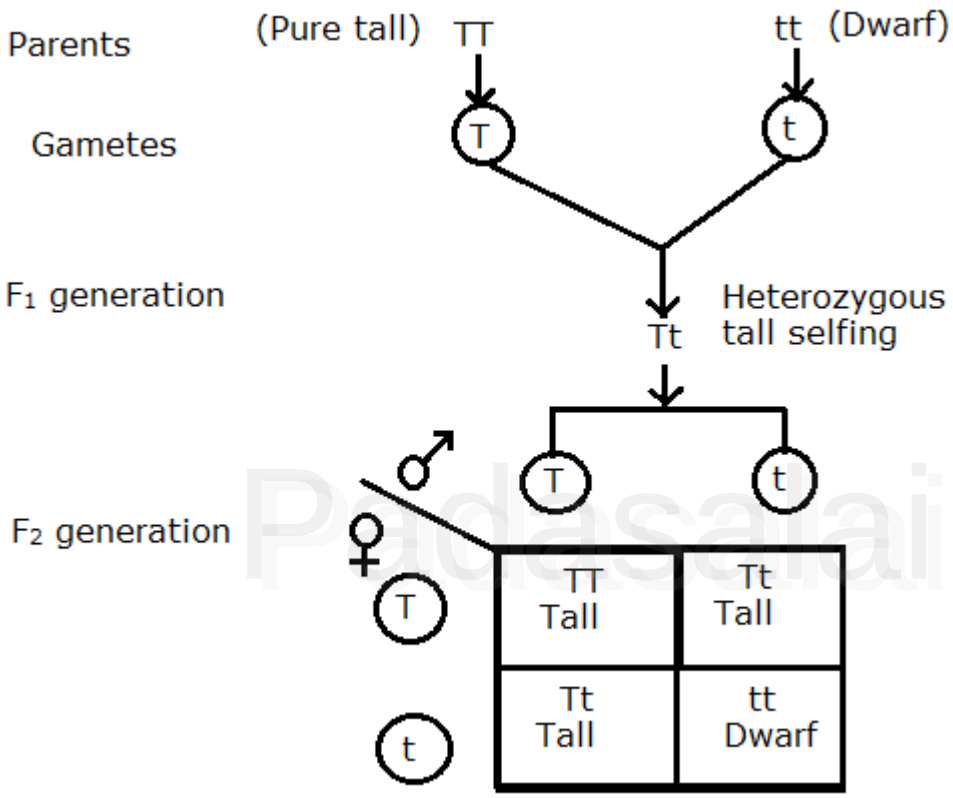
To study the law of dominance by using model/ picture/ photograph. To find out the genotype ratio and phenotype ratio in pea plant using checker board.

Material required:

Colour chalk pieces or Graph sheets

Procedure:

Depict parental generation and the gametes using colour chalk pieces.



Observation:

Phenotypic ratio 3:1

Genotypic ratio 1:2:1

Result:

Using the model, the law of dominance and the monohybrid cross study were found.

BIO-ZOOLOGY

12. IDENTIFICATION OF MODELS – HUMAN HEART AND HUMAN BRAIN

Aim:

To identify the given models, draw a labelled diagram and write a note on it.

Material required:

Models (Human Heart and Human Brain)

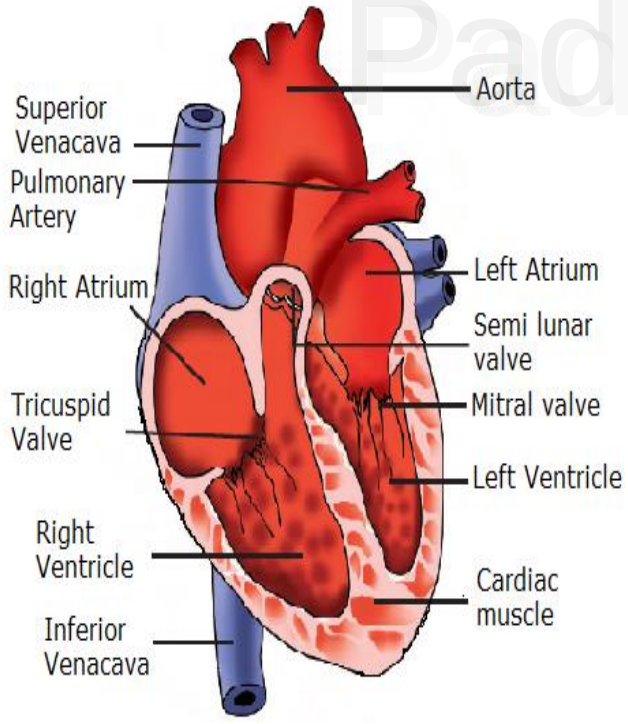
Identification:

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

Notes:

- The human heart made up of cardiac muscle
- The heart has four chambers
- The heart pumps blood to all parts of the body
- The heart is covered by pericardium

Diagram:



Result:

The given model was identified as the L.S of the human heart.

OR

Aim:

To identify the given models, draw a labelled diagram and write a note on it.

Material required:

Models (Human Heart and Human Brain)

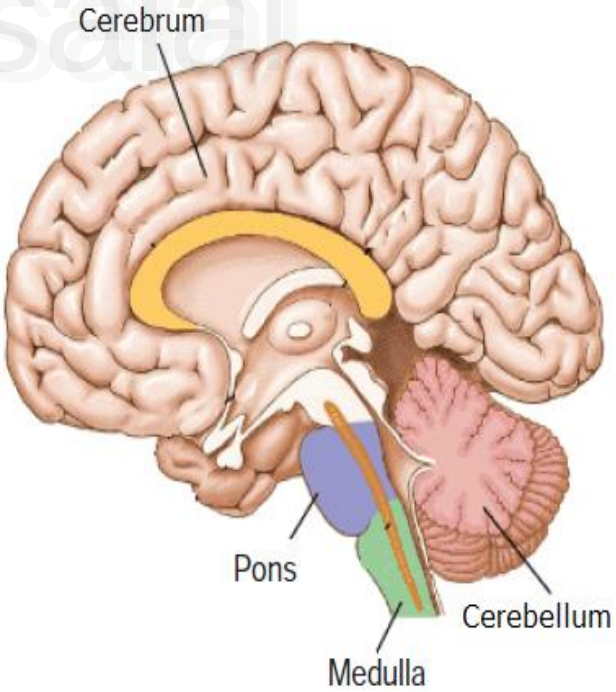
Identification:

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

Notes:

- The brain is enclosed in the cranial cavity
- It is the controlling centre of the all body activities
- It is covered by three connective tissue membrane
- The brain is divided into three parts

Diagram:



Result:

The given model was identified as the L.S of the human brain.

PHYSICS

1. 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 and thread

Principle:

Clock wise moment ($W_1 \times d_1$) = Anticlockwise moment ($W_2 \times d_2$)

Formula:

$$W_1 = \frac{W_2 x d_2}{d_1} \text{ N}$$

W1 – Unknown weight

W2 – Known weight

d1 – Distance of unknown weight

d2 – Distance of known weight

Procedure:

- A metre scale is supported at its centre of gravity by a knife edge and ensure that the scale is in equilibrium position.
- A known weight W2 and unknown weight W1 are suspended from to either side of the scale using the weight hangers.
- Fix the position of one weight hanger and adjust the position of the second weight hanger such that the scale is in equilibrium.
- Measure the distance d1 and d2 of the two weight hangers.
- The experiment is repeated for the different positions of the unknown weight. Measure the distances. The reading is tabulated as follows.

Observation:

S. No	Known weight W_2 (N)	Distance of known weight d_2 ($x10^{-2}$ m)	Distance of unknown weight d_1 ($x10^{-2}$ m)	$W_2 x d_2$ ($x10^{-2}$ Nm)	Unknown weight $W_1 = \frac{W_2 x d_2}{d_1}$ (N)
1	1	15	12	15	1.25
2	1	20	16	20	1.25
				Mean	1.25

Result:

Using the principle of moments, the weight of the unknown body W_1 = **1.25** N

CHEMISTRY

4. IDENTIFY THE DISSOLUTION OF GIVEN SALT WHETHER IT IS EXOTHERMIC OR ENDOTHERMIC

Aim:

To test the dissolution of given salt is exothermic or endothermic

Material required:

Two beakers, Thermometer, stirrer and two samples

Principle:

- If the reaction liberates the heat, then it is called exothermic
- If the reaction absorbs the heat, then it is called endothermic

Procedure:

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

Observation:

S. No	Sample	Temperature before addition of sample (^{O}C)	Temperature after addition of sample (^{O}C)	Inference
1	A	25	48	Temperature increases
2	B	25	18	Temperature decreases

Result:

From the inferences made

The dissolution of sample A is **exothermic**.

The dissolution of sample B is **endothermic**.

BIO-BOTANY

9. PARTS OF FLOWER

Aim:

To dissect and display the parts of given flower and draw labelled sketches

Material required:

Flower, needle and paper

Procedure:

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

Diagram:

Observation:

Floral parts:

Accessory organ

- Calyx
- Corolla

Reproductive organ

- Androecium (Male part)
- Gynoecium (Female part)

Result:

Parts of the given flower were dissected and submitted to sight.

BIO - ZOOLOGY

13. IDENTIFICAION OF BLOOD CELLS

Aim:

To identify the given slides, draw a labelled diagram and write a note on it.

Material required:

Permanent slides of blood cells and Microscope

Identification:

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Notes:

- They are biconcave and disc shaped
- Mature mammalian RBC's do not have nucleus
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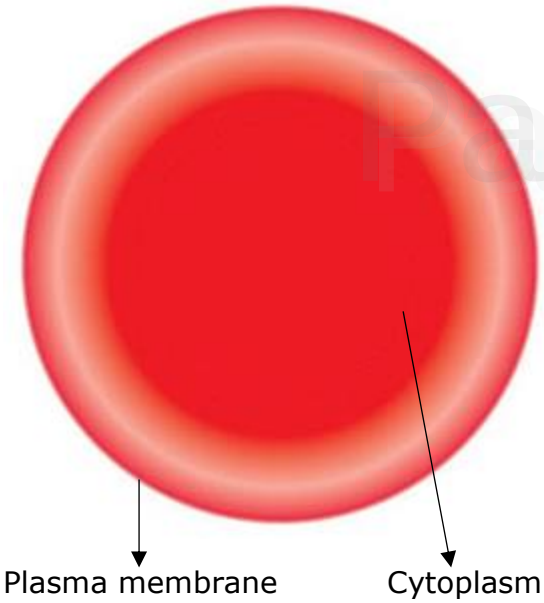
Diagram:



Result:

The given slide was identified as the Red Blood Cell.

OR

Aim:

To identify the given slides, draw a labelled diagram and write a note on it.

Material required:

Permanent slides of blood cells and Microscope

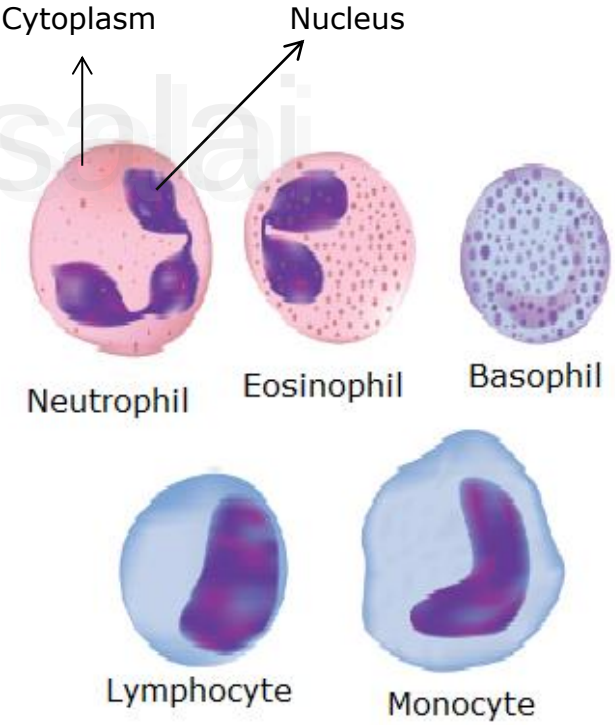
Identification:

The given slide is identified as White Blood Cell

Notes:

- They are colourless and they have amoeboid shaped.
- They have nucleus.
- They protect the body from diseases.

Diagram:



Result:

The given slide was identified as the White Blood Cell.

PHYSICS

3.DETERMINATION OF RESISTIVITY

Aim:

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

Apparatus required:

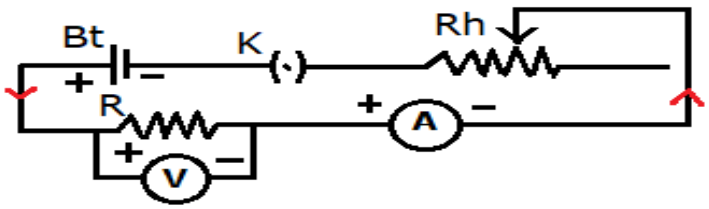
A coil wire, battery, key, ammeter, voltmeter, rheostat, a metre scale and screw gauge

Formula:

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

A – Area of the cross section of the wire
L – Length of the coil wire R – Resistance of the coil wire

Circuit diagram:



Bt - Battery
K - Key
Rh - Rheostat
R - Resistance
V - Volt meter
A - Ammeter

Procedure:

- According to the picture the circuit should be installed. Close the key and hence the circuit is closed.
- The potential difference should be noted in the table for the change of the rheostat and for different current measurements.
- Measure the diameter of the wire using a screw gauge.
- Measure the length of the coil using meter scale.

Observation:

(I) To find the resistance

S. No	Ammeter reading – I (A)	Volt meter reading – V (V)	Resistance R= V/I (Ω)
1	0.2	0.4	2
2	0.3	0.6	2
		Mean	2

(II) To find the diameter of the wire using screw gauge

Least Count: **0.01 mm** Zero Error: No Error

S. No	Pitch scale reading PSR (mm)	Head scale coincidence (HSC)	Head scale reading HSR=(PSR×LC) ± ZE (mm)	Corrected reading PSR+HSR (mm)
1	1	63	0.63	1.63
2	1	65	0.65	1.65
			Mean	1.64

Calculation:

Radius of the wire r= diameter/2 = 0.82×10^{-3} m
Area of the cross section of the wire $A = \pi r^2$ = 2.11×10^{-6} m^2
Length of the wire L = 1 m
Resistivity of the wire $\rho = \left(\frac{A}{L}\right) R$ = 4.22×10^{-6} Ωm

Result:

The resistivity of the material of the wire = **4.22×10^{-6}** Ωm

CHEMISTRY

7. TEST THE GIVEN SAMPLE FOR THE PRESENCE OF ACID OR BASE

Aim:

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

Materials required:

Test-tube, test-tube stand, glass rod, indicators and the given sample

Principle:

Indicator	Acid	Base
Phenolphthalein	Colourless	Pink colour
Methyl orange	Pink colour	Yellow colour
Sodium carbonate	Brisk effervescence	No brisk effervescence

Procedure:

S. No	Experiment	Observation	Inference
1	Take 5 ml of the solution in a test tube and add few drops of Phenolphthalein in it	No change in colour	Presence of acid
2	Take 5 ml of the solution in a test tube and add few drops of Methyl orange in it	Turns pink in colour	Presence of acid
3	Take 5 ml of the solution in a test tube and add pinch of sodium carbonate in it	Brisk effervescence	Presence of acid

Result:

The given test solution contains **acid**

OR

Aim:

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

Materials required:

Test-tube, test-tube stand, glass rod, indicators and the given sample

Principle:

Indicator	Acid	Base
Phenolphthalein	Colourless	Pink colour
Methyl orange	Pink colour	Yellow colour
Sodium carbonate	Brisk effervescence	No brisk effervescence

Procedure:

S. No	Experiment	Observation	Inference
1	Take 5 ml of the solution in a test tube and add few drops of Phenolphthalein in it	Turns pink in colour	Presence of base
2	Take 5 ml of the solution in a test tube and add few drops of Methyl orange in it	Turns yellow in colour	Presence of base
3	Take 5 ml of the solution in a test tube and add pinch of sodium carbonate in it	No brisk effervescence	Presence of base

Result:

The given test solution contains **base**

BIO-BOTANY

11. OBSERVATION OF TRANSVESE SECTION OF DICOT STEM AND DICOT ROOT

Aim:

To identify the given slide with the help of microscope

Material required:

Slides and Microscope

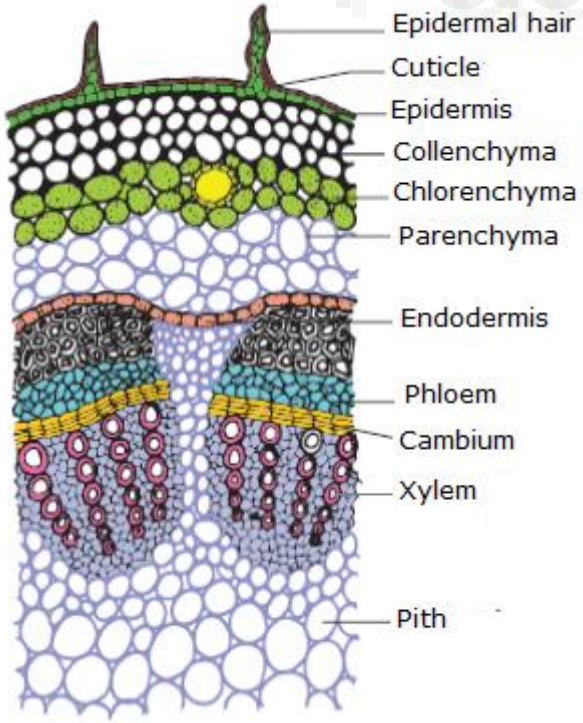
Identification:

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

Reasons:

- Vascular bundles are arranged in a ring
- Conjoint, collateral, end arch and open vascular bundle
- Ground tissue differentiated
- 3 to 6 layer of collenchyma tissues present in hypodermis

Diagram:



Result:

The given slide was identified as T.S of the Dicot stem.

OR

Aim:

To identify the given slide with the help of microscope

Material required:

Slides and Microscope

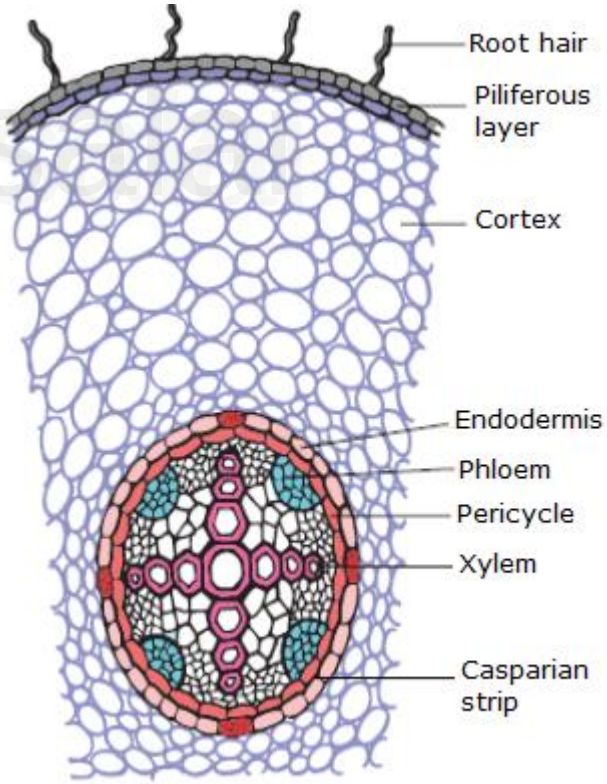
Identification:

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

Reasons:

- Radial vascular bundle
- 2 to 4 xylem presents
- Cambium present
- Cortex is made up of parenchymatous cells

Diagram:



Result:

The given slide was identified as T.S of the Dicot root.

BIO - ZOOLOGY

14. IDENTIFICATION OF ENDOCRINE GLANDS

Aim:

To identify the endocrine glands, its location hormone secreted and functions

Material required:

Flag labelled Endocrine gland models

Identification:

The flag labelled endocrine gland is identified as Thyroid gland

Location:

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

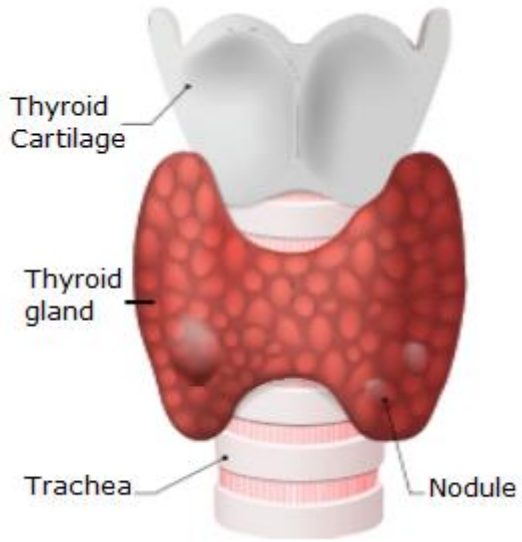
Hormones secreted:

Tri iodothyronine (T3) and Thyroxine (T4)

Functions:

- It regulates metabolism
- It increases the body temperature
- It is required for normal growth and development
- It is also known as personality hormone

Diagram:



Result:

The given model was identified as the thyroid gland.

OR

Aim:

To identify the endocrine glands, its location hormone secreted and functions

Material required:

Flag labelled Endocrine gland models

Identification:

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

Location:

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

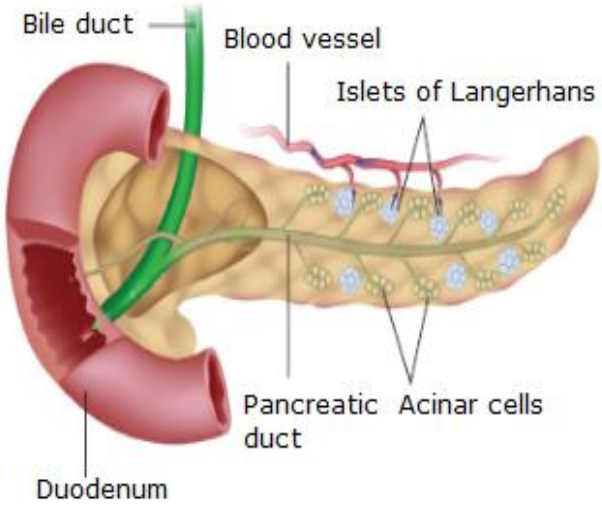
Hormones secreted:

- α cells secrete glucagon
- β cells secrete insulin

Functions:

- Insulin converts glucose into glycogen
- Glucagon converts glycogen into glucose
- Insulin and Glucagon maintain the blood sugar level

Diagram:



Result:

The given model was identified as the Islets of Langerhans in the pancreas.