10ᵀᴴ STANDARD

SCIENCE

PRACTICAL GUIDE

2020-21
(Revised Syllabus)

A. AROKIASURESH

BT ASSISTANT (SCIENCE)

GOVT. HR. SEC. SCHOOL

KALAMARUDUR

KALLAKURICHI (DT)

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. uv 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. uv 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) = <u>10.5</u> cm

(2f) = <u>21</u> cm

S. No	Position of the object	Distance of the Object (cm)	Distance of the Image (cm)	Focal length of the convex lens $f = \dfrac{uv}{(u+v)}$ 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 = <u>10.50</u> cm

2. By uv method   f = <u>10.55</u> cm

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
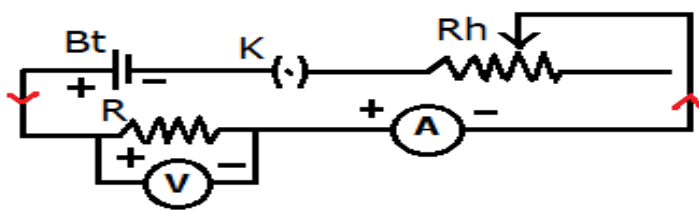
Formula:

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

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: <u>No Error</u>

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 = <u>0.82×10⁻³</u> m
Area of the cross section of the wire $A = \pi r^2$ = <u>2.11×10⁻⁶</u> m²
Length of the wire L = <u>1</u> m
Resistivity of the wire $\rho = \left(\dfrac{A}{L}\right) R$ = <u>4.22×10⁻⁶</u> Ωm

Result:

The resistivity of the material of the wire = **4.22×10⁻⁶ Ωm**

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.**

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

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.

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.

A. AROKIASURESH, M.SC.B.ED., BT ASST. (SCIENCE), GHSS, KALAMARUDUR, KALLAKURICHI (DT).

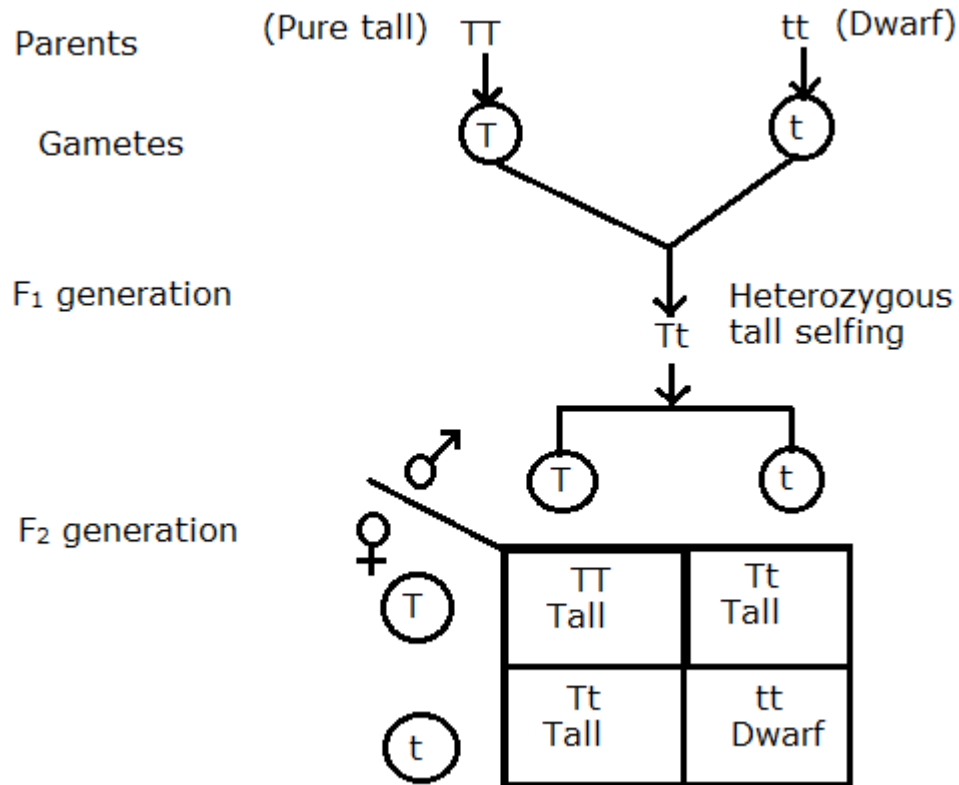# 10. TO STUDY THE LAW OF DOMINANCE

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.

Parents   (Pure tall) TT   tt (Dwarf)

Gametes   T   t

F_1 generation   Tt   Heterozygous tall selfing

F_2 generation

	T	t
T	TT Tall	Tt Tall
t	Tt Tall	tt Dwarf

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.

A. AROKIASURESH, M.SC.B.ED., BT ASST. (SCIENCE), GHSS, KALAMARUDUR, KALLAKURICHI (DT).

kalviasiriyarkal.blogspot.com

BIO-ZOOLOGY

13. IDENTIFICAION OF BLOOD CELLS

Aim:

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

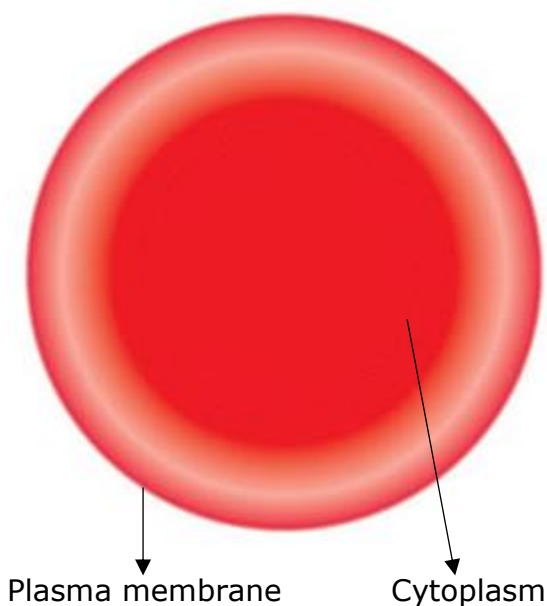**Material required:**

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:

Plasma membrane   Cytoplasm

Result:

The given slide was identified as the Red Blood Cell.

Aim:

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

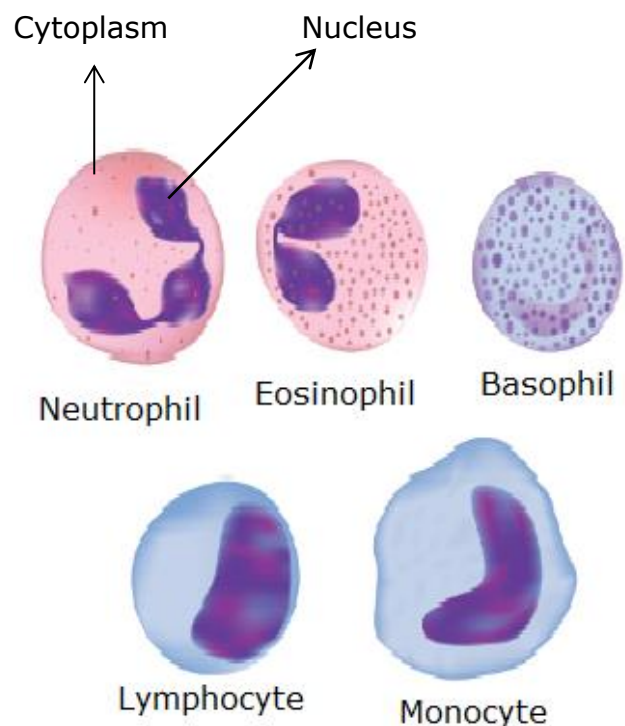**Material required:**

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:

Cytoplasm   Nucleus

Neutrophil   Eosinophil   Basophil

Lymphocyte   Monocyte

Result:

The given slide was identified as the White Blood Cell.

A. AROKIASURESH, M.Sc.B.Ed., BT ASST. (SCIENCE), GHSS, KALAMARUDUR, KALLAKURICHI (DT).

kanithannews.blogspot.com

அனைவருக்கும் வணக்கம்.

நமது கல்வி ஆசிரியர்கள் **KALVI ASIRIYARKAL** -வலைதளத்தில்
(ஒன்றாம் வகுப்பு முதல் பன்னிரண்டாம் வகுப்பு வரை)

1-st STD to 12-th Standard:- வரை Revised New Syllabus Study Materials,
Guides, 10th,11-th & 12-th Standard public exam Question Papers, Public
Exam Answer Key, 1-st std to 12-th Std Slow Learners Materials, Minimum
Materials, All Subject Guides and Lesson Plan & Learning Outcomes
போன்றவற்றை பகிர்ந்து வருகிறோம்.

இவற்றை படித்து நல்ல மதிப்பெண்களை பெற்று தேர்வில் வெற்றி
பெற வாழ்த்துகிறது KALVI ASIRIYARKAL வலைதளம் ....

மேலும் முழுமையான தகவல்களை தெரிந்துகொள்ள
கல்விஆசிரியர்கள் (**KALVI ASIRIYARKAL**)-உடன் இணைந்து இருங்கள்...

தங்களின் மேலான கருத்து மட்டும் தகவல்களுக்கு....
கல்வி ஆசிரியர்கள்- அனைத்து வகுப்பிற்கும் பாடக்குறிப்புகள்,
STUDY MATERIALS மற்றும் பயனுள்ள தகவல்கள் பெறுவதற்கான
வாட்ஸ் அப் குழுக்கள் உருவாக்கப்பட்டுள்ளது.....

ஆகவே கீழ்கண்ட ஏதேனும் ஒரு குழுவில் மட்டும் தாங்கள்
இணைந்து பயன்பெற்று மற்றும் வாழ்வில் உயர்வினை அடைய
வாழ்த்துக்களை தெரிவித்துக் கொள்கிறோம்.....

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நன்றி

என்றும் மாறாத அன்புடன்.,
கார்த்திக் - **M.SC.,M.Ed.,**
முதுகலை கணித ஆசிரியர்.,
திருப்பூர்-641664

Phone: 9789321150
G-Mail:
kalviasiriyarkal@gmail.com
Website:
kalviasiriyarkal.blogspot.com

kalviasiriyarkal.blogspot.com