Girls' High School & College, Prayagraj
Session: 2021-2022
Class: 10 A B C D E
Subject: Physics Practical

Instructions:

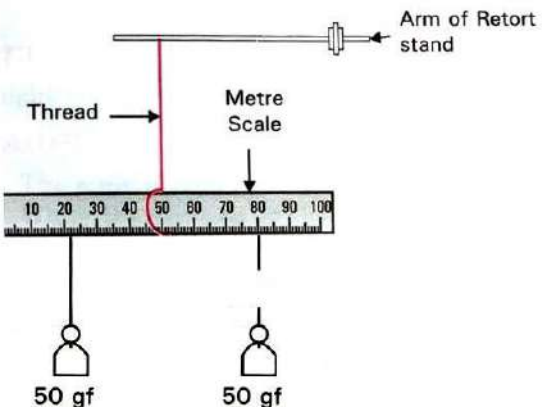
1. Parents are expected to ensure that the student writes all experiments in Physics Practical Work-Book.
2. Each experiment should start from a new page.
3. Well labelled diagrams to be drawn on the left page only.
4. The student will retain and bring the practical file when the school reopens.

EXPERIMENT No.1

AIM: To verify the principle of moments.

APPARATUS USED: Metallic stand, metre ruler, weights and string.

PRINCIPLE: In equilibrium, the sum of anticlockwise moments is equal to the sum of clockwise moments.



OBSERVATIONS AND CALCULATIONS:

Position of centre of gravity of the metre ruler G = **50.0** cm

Weight W_1 = **50** gf

Weight W_2 = **100** gf

Sl. No.	X (in cm from G)	Y (in cm from G)	W1×X (gf-cm)	W2 ×Y (gf-cm)
1	**30 .0**	**15.0**	**1500**	**1500**
2	**25.0**	**12.5**	**1250**	**1250**
3	**20.0**	**10.0**	**1000**	**1000**
4	**15.0**	**7.5**	**750**	**750**

RESULT: Since $W_1 \times X = W_2 \times Y$ (approximately equal), it verify the principle of moments.

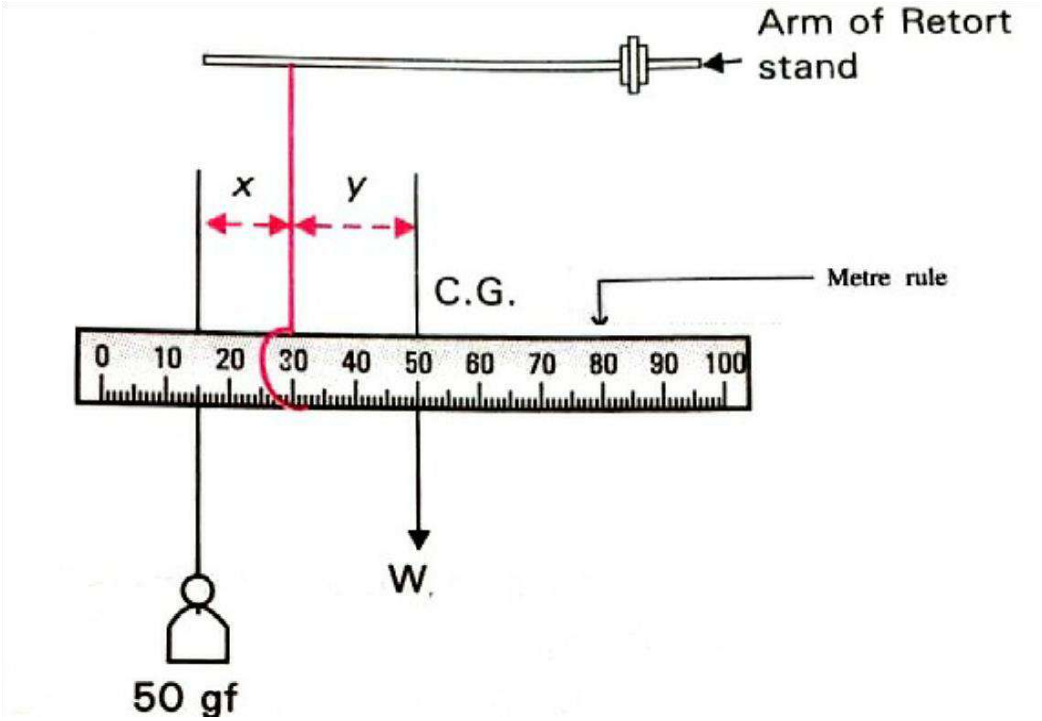
EXPERIMENT No.2

AIM: To determine the weight of the given metre ruler using principle of moments.

APPARATUS REQUIRED: Metre ruler, string, known weight, metallic stand.

PRINCIPLE : According to the principle of moments,

Under equilibrium conditions, the sum of all anticlockwise moments= the sum of of all clockwise moments.



OBSERVATIONS AND CALCULATIONS:

Least count of the metre ruler=0.1 cm

Position of centre of gravity of the metre ruler=50.0 cm

Known weight W_1=100 gf

Sl. No.	Distance of weight from suspension =X (cm)	Distance of suspension from center of gravity = Y (cm)	W=W1*(X/Y) (gf)
1	**10.0**	**8.0**	**125**
2	**15.0**	**12.0**	**125**
3	**20.0**	**16.0**	**125**
4	**25.0**	**20.0**	**125**

Average weight of the metre ruler= **(125+125+125+125)/4 gf=125gf**

RESULT: The weight of the given metre ruler as determined from the experiment=**125** g.

EXPERIMENTNo.3

AIM: To determine the relative density of brass bob using principle of moments.

APPARATUSUSED: Metre ruler, metallic stand, string, known weight, brass bob and beaker filled with water.

THEORY: The relative density of the substance is defined as the ratio of its density to the density of water at 4^0C i.e. the ratio of mass of the substance to the mass of an equal volume of water or weight of substance to the weight of water displaced by the substance.

R.D. = weight of the substance/weight of water displaced by the substance

R.D. = W / (W-W')

Where W = weight of the substance in air, and W' = weight of substance in water.

Since **W = (W1*X1)/Y**

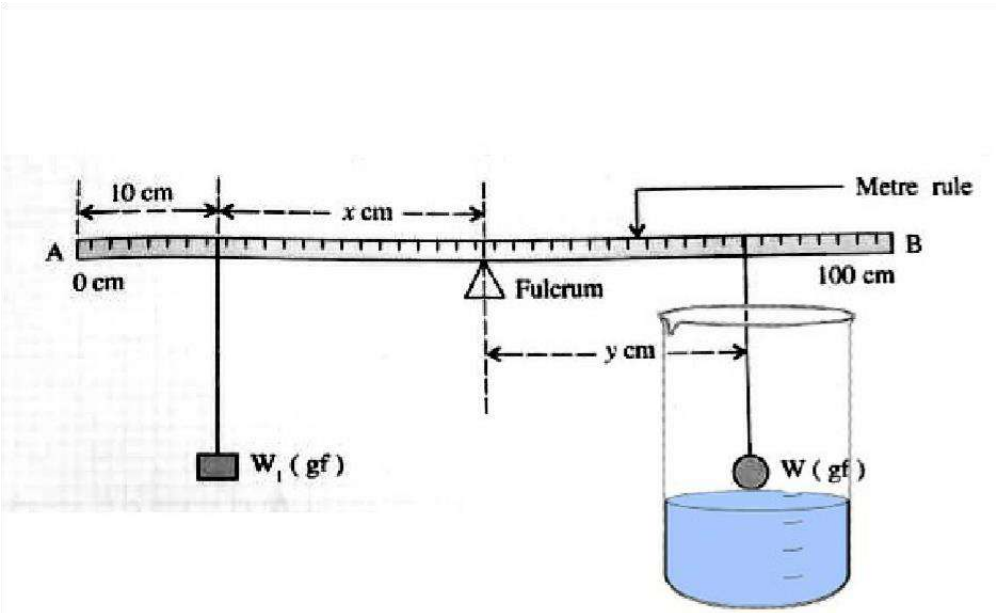
W' = (W1*X2)/Y

Where X1 = distance of known weight from the centre of gravity of metre rule rwhen metallic bob is in air,

X2 = distance of known weight from the centre of gravity of metre ruler when metallic bob is in water, and

Y=distance of metallic bob from the centre of gravity of metre ruler.

Thus, **R.D. = X1/(X1-X2)**



OBSERVATIONS AND CALCULATIONS:

Least count of the metre ruler=0.1 cm
Known weight W1=50 gf
Position of centre of gravity of the metre ruler (CG) =49.8 cm.

Sl. No.	Y(in cm)	X1(in cm)	X2(in cm)	R.D. = X1/(X1-X2)
1	15.0	13.0	11.0	7.5
2	20.0	17.5	15.0	8.0
3	25.0	22.0	19.0	8.3
4	30.0	26.3	23.0	8.1

AVERAGER.D. = (7.5 + 8.0 + 8.3 + 8.1) / 4

=.31.9/4 = 7.975 = 8.0

RESULT: The relative density of brass bob from above experiment = 8.0

EXPERIMENT No.4

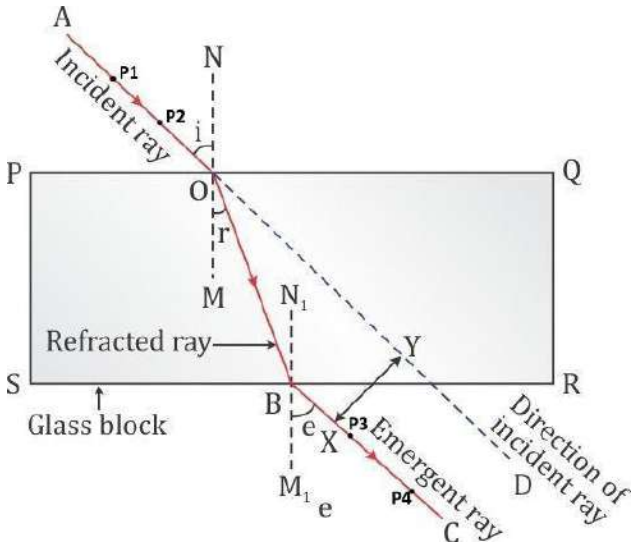
AIM: To show that after refraction through a glass slab, the emergent ray is parallel to incident ray in a glass block.

APPARATUS USED: A glass block, a drawing board, a white sheet of paper, pencil, ruler, board pins, protractor and common pins.

LAWS OF REFRACTION:

1) The incident ray, the refracted ray and the normal at the point of incidence, all lie in the same plane.

2) The ratio of the sine of the angle of incidence **i** to the sine of the angle of refraction **r** is constant for the pair of given media.



OBSERVATIONS AND CALCULATIONS:

Sl.No.	Angle of incidence ray i (in degrees)	Angle of emergent ray e (in degrees)
1	30	30
2	40	40
3	50	50
4	60	60

RESULT: As observed from the observation sheet, the emergent ray makes the same angle with the glass block as made by the incident ray. This shows that emergent ray goes parallel to the incident ray.

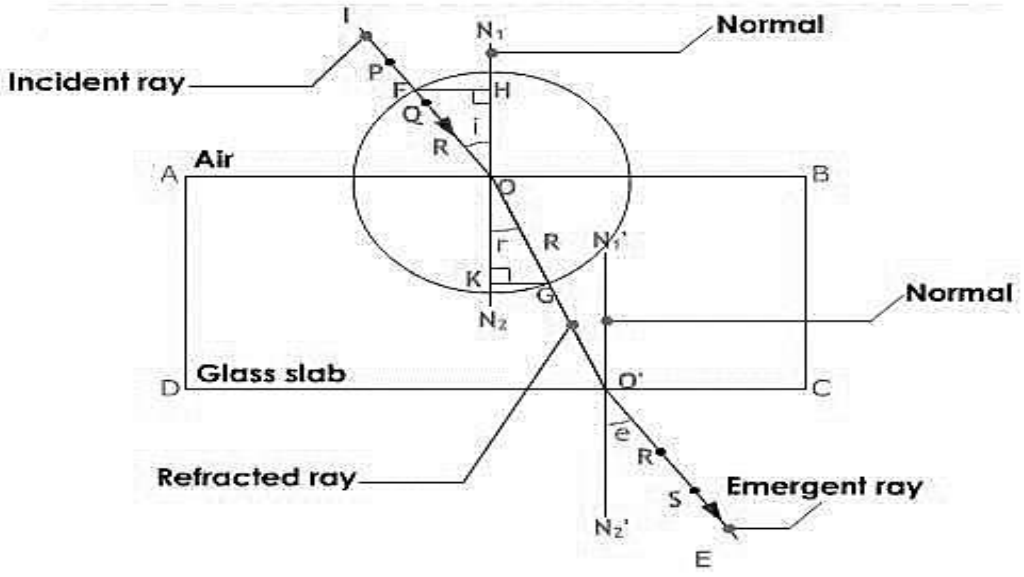
EXPERIMENT NO.5

AIM: To determine the refractive index of the material of the glass block.

APPARATUS USED: A drawing board, a glass block, drawing pins, common pins, a white sheet of paper, compass, protractor, pencil and ruler.

LAW USED: According to Snell's law, the ratio of the sine of the angle of incidence **i** to the sine of the angle of the refraction **r** is constant for the pair of given media.

Numerically, this constant ratio is equal to the refractive index of the second medium with respect to the first medium.



Refractive index (n) = sin i/sin r

= (FH/FO)/(KG/GO)

= (FH/FO)/(KG/FO)

= FH/KG

OBSERVATIONS AND CALCULATIONS:

Sl. No.	Angle of incidence i (in degrees)	FH (in cm)	KG (in cm)	Refractive index (n)=FH/KG
1	**30**	**1.8**	**1.2**	**1.5**
2	**40**	**2.6**	**1.6**	**1.5**
3	**50**	**3.2**	**2.0**	**1.6**
4	**60**	**2.6**	**1.8**	**1.4**

Mean refractive index = (1.5+1.5+1.6+1.4)/4

= 1.5

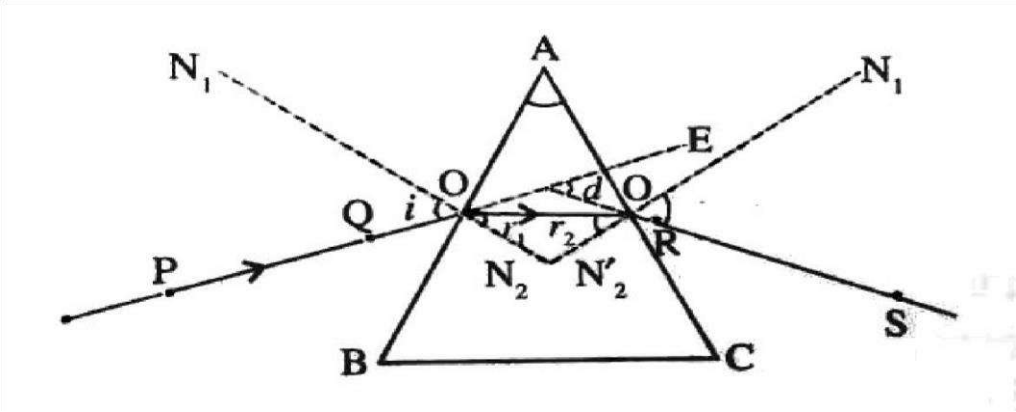
RESULT: The refractive index of a given glass block as obtained from the above experiment =**1.5**

EXPERIMENT NO. 6

AIM: To determine the minimum deviation produced by the equilateral glass prism.

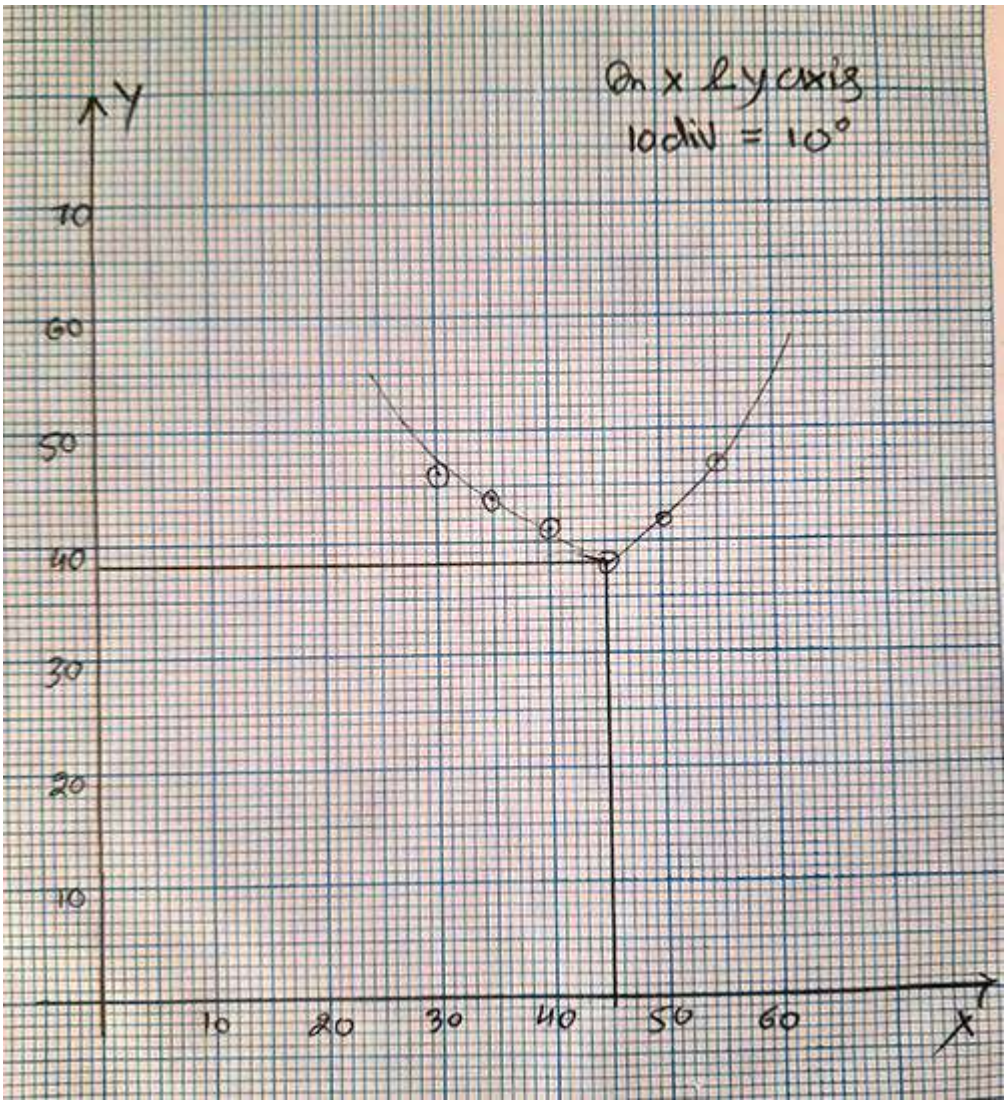
APPARATUS USED: A drawing board, a white sheet of paper, common pins, an equilateral prism, drawing pins, ruler, protractor and pencil.

PRINCIPLE: For a small angle of incidence, as the angle of incidence increases, the angle of deviation first decreases, reaches the minimum and then increases with the angle of incidence. The minimum value of angle of deviation reached is called the angle of minimum deviation.



OBSERVATIONS AND CALCULATIONS:

Sl. No.	Angle of incidence i(in degrees)	Angle of deviation (in degrees)
1	30	46
2	35	44
3	40	41
4	45	38
5	50	42
6	55	47



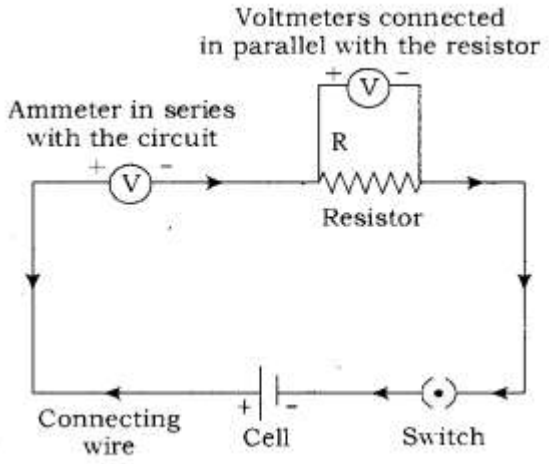
RESULT: From graph, the angle of minimum deviation = 38^0

EXPERIMENT NO.7

AIM: - To verify ohm's law using simple electric circuit.

APPARATUS REQUIRED: - Coiled resistor of 2 ohm, ammeter 0 – 3.0 A, voltmeter 0 -3-0 V, rheostat, key, battery 2.0 V and connecting wires.

OHM'S LAW: - According to Ohm's law, the current flowing in a conductor is directly proportional to the potential difference applied across its ends provided that the physical conditions and the temperature of the conductor remain constant.



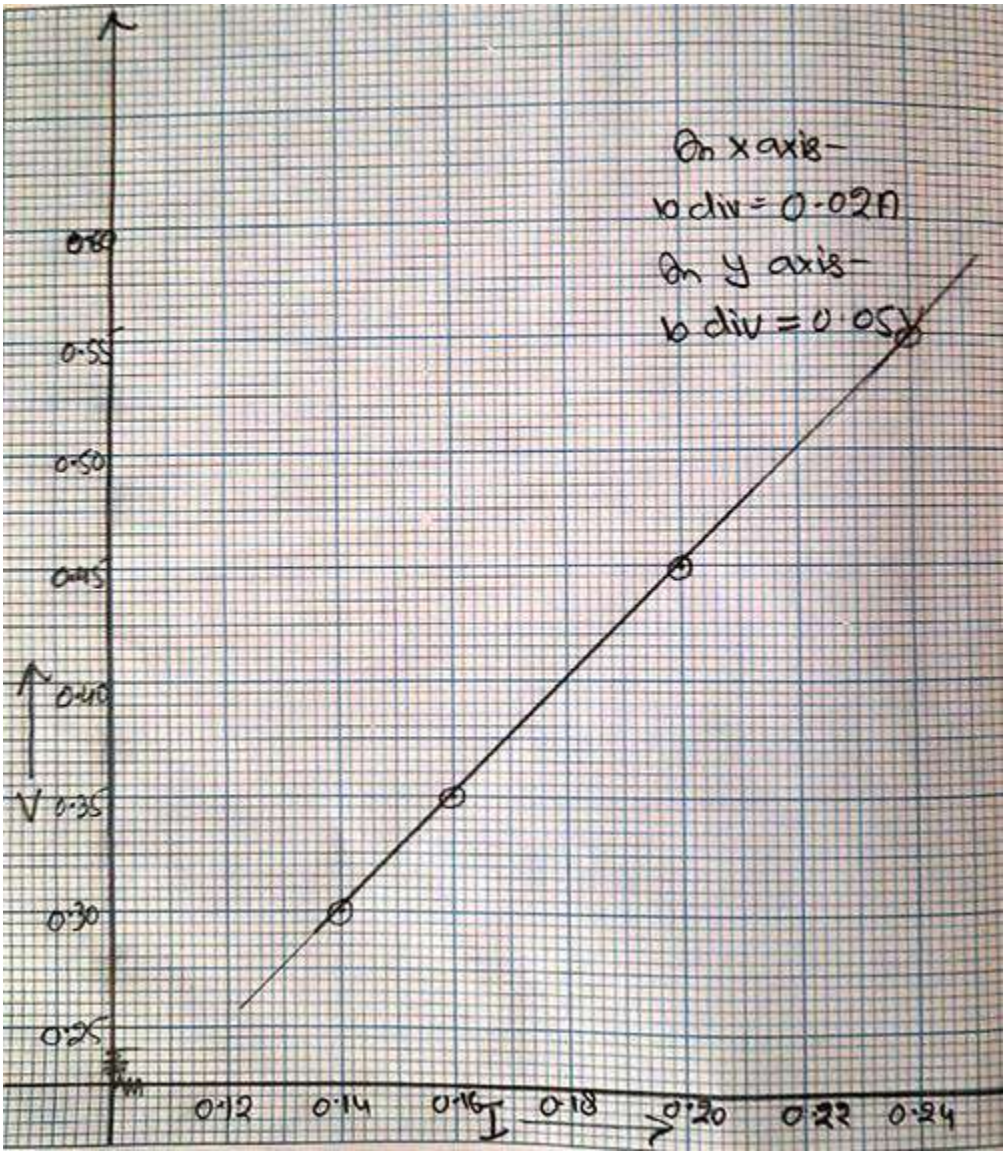
OBSERVATIONS:-

Least count of the ammeter =**0.02** A

Least count of the voltmeter =**0.05** V

S. No.	Ammeter Reading I (in amp.)	Voltmeter Reading V (in volts)
1.	0.14	0.30
2.	0.16	0.35
3.	0.20	0.45

4	**0.24**	**0.55**



RESULT: - Since V – I graph is a straight line which verifies Ohm's law.

Girls' High School & College, Prayagraj

Session: 2021-22

Class: X A, B, C, D, E

Subject: Chemistry Practical

INSTRUCTIONS: Students are advised to write the following chemistry practicals (Exp. No. 1 to 10) in chemistry practical file (D. M. publication / Nova Publication). These experiments are to be written neatly. The same pattern of writing is to be followed as given. Write each experiment on a fresh page.

EXPERIMENT NO. 1

(A)

Take a little amount of the substance in a clean dry hard glass test tube and add a small quantity of conc. H_2SO_4 in it and heat it gently. Make your observations, identify the gas evolved and give your deduction.

(1) **Observations:**
   (i) A colourless, pungent and suffocating gas is evolved.
   (ii) The gas turns moist blue litmus paper red.

(2) **Confirmatory test for the gas**:
   When a glass rod dipped in NH_4OH solution is brought near the evolved gas, it gives dense white fumes. Thus, the gas evolved is HCl.

(3) **Name of an anion:** Cl^- (chloride ion)

(4) **Deduction**: The given salt is chloride salt.

(B)

Add a small quantity of conc. H_2SO_4 and manganese dioxide (MnO_2) to the given substance and heat it gently. Make your observation, identity the gas evolved and give your deduction.

(1) **Observations:**
   (i) A gas of choking odour is evolved.
   (ii) A greenish yellow coloured gas is evolved.
   (iii) The gas evolved turns moist blue litmus paper red and finally bleaches it.
   (iv) It turns starch iodide paper blue-black.

(2) **Confirmatory test for the gas:**

Add silver nitrate solution to the water extract of the given substance. White precipitate appears which dissolves in excess NH_4OH solution. Thus, the gas evolved is chlorine.

(3) **Name of an anion**: Cl^- (chloride ion)

(4) **Deduction**: The given salt is chloride salt.

EXPERIMENT NO. 2

(A)

Take a small amount of the substance in a clean hard glass test tube and add small amount of NaOH in it. Warm the mixture gently, record your observations, identify the gas evolved and give your deduction.

(1) **Observations**:

(i) The evolved gas is colourless.

(ii) The evolved gas has pungent smell.

(iii) The evolved gas turns moist red litmus paper blue, hence it is basic in nature.

(2) **Confirmatory test for the gas**:

When glass rod dipped in HCl solution is brought near the evolved gas, dense white fumes appear. Evolved gas turns Nessler's reagent brown. Thus, the gas evolved is ammonia (NH_3).

(3) **Name of the cation**: NH_4^+

(4) **Deduction:** The given salt is ammonium salt.

(B)

Take a small amount of the substance in a clean dry hard glass test tube. Heat it first gently and then strongly. Make your observations, identify the gas evolved and give your deduction.

(1) **Observations:**

(i) The gas evolved is colourless

(ii) It has a pungent smell

(iii) It turns red litmus blue

(2) **Confirmatory test for the gas:**

It gives dense white fumes with a rod dipped in HCl solution. Thus, the gas evolved is ammonia (NH_3).

(3) **Name of the cation**: NH_4^+

(4) **Deduction**: The given salt is an ammonium salt.

EXPERIMENT NO. 3

(A)

Take a small amount of the substance in a clean, dry, hard glass test tube and heat it strongly. Make your observations, identify the gas evolved and give your deduction.

(1) **Observations:**

(i) On strong heating, the light amorphous white solid, changes to pale yellow.

(ii) Gives off a colourless and odourless gas that turns lime water milky. The milkiness disappears on passing excess of gas.

(iii) The gas has no effect on acidified $K_2Cr_2O_7$ or acidified $KMnO_4$.

(iv) The residue, on cooling, changes to a white colour i.e. residue is yellow when hot and white when cold.

(2) **Identification of the gas evolved**:

Since the gas turns limewater milky, but has no effect on acidified $K_2Cr_2O_7$ or acidified $KMnO_4$, therefore the gas evolved is carbon dioxide (CO_2).

(3) **Name of the anion**: Carbonate ion (CO_3^{2-})

(4) **Deduction**: The residue obtained is zinc oxide. The given substance is zinc carbonate.

(B)

Take a little portion of the substance in a clean hard glass test tube. Add dilute HCl in it. Make your observations, identify the gas evolved, name the anion and give your deduction.

(1) **Observations:**

(i) On adding dil. HCl to the given substance, a gas is evolved with brisk effervescence.

(ii) The gas turns blue litmus paper red.

(iii) The gas turns limewater milky, but has no effect on acidified $K_2Cr_2O_7$.

(2) **Identification of the gas evolved**:

Since the gas turns limewater milky, but has no effect on acidified $K_2Cr_2O_7$, therefore it is CO_2 gas and negative radical is CO_3^{2-}

(3) **Name of the anion**: carbonate ion (CO_3^{2-})

(4) **Deduction:** the given substance is a carbonate salt.

(C)

You are given a solution. To the first part of this solution, add a few drops of dil. HCl and barium chloride solution. Make your observations, name the anion and give your deduction.

(1) **Observation:**

On adding barium chloride, a thick white precipitate is obtained which is insoluble in dil. HCl

(2) **Name of the anion**: Sulphate ion (SO_4^{2-})

(3) **Deduction:** The white precipitate is of barium sulphate .

C-1

To the second part of this solution, add NaOH solution drop by drop and then in excess. Make your observations, name the cation and give your deduction.

(1) **Observation:**

(i) On adding NaOH solution drop by drop, white gelatinous precipitate is formed. The white precipitate is dissolved in excess of NaOH giving a clear solution.

(2) **Name of the cation**: zinc ion (Zn^{2+})

(3) **Deduction**: The white precipitate is of $Zn(OH)_2$. The white precipitate dissolves in excess of NaOH due to the formation of Na_2ZnO_2. $Zn(OH)_2$ dissolves in excess of NaOH because it is amphoteric in nature.

C-2

Take third part of the given solution and add NH_4OH solution drop by drop and then in excess. Make your observations, name the cation and give your deduction.

(1) **Observation**: On adding NH_4OH solution drop by drop, white gelatinous precipitate is formed which dissolves in excess of NH_4OH solution.

(2) **Name of the cation**: zinc ion (Zn^{2+})

(3) **Deduction**: The white precipitate is of zinc hydroxide. It dissolves in excess of NH_4OH due to the formation of tetraamminezinc(II)sulphate. Thus the given solution is of zinc sulphate.

EXPERIMENT NO. 4

(A)

Take a small amount of the substance in a clean dry glass test tube, heat it first gently and then strongly. Make your observations, identify the gas evolved and give your deduction.

(1) **Observations:**

(i) On heating the given substance, a hissing sound is produced and droplets of a colourless liquid condense on the upper cooler parts of the test tube.

(ii) On heating it strongly, a white residue is left behind.

(iii) On very strong heating, the white residue changes to a black residue and a colourless pungent smelling gas is evolved.

(iv) The gas turns moist blue litmus red.

(2) **Identification of the gas evolved:**

(i) The colourless liquid turns cobalt chloride paper pink. Hence there is water of crystallization.

(ii) The pungent smelling gas turns acidified $K_2Cr_2O_7$ paper green, hence it is SO_2

(3) **Deduction:**

(i) It is a hydrated salt and the gas evolved is sulphur dioxide.

(ii) The white residue formed on heating is of anhydrous copper sulphate.

(iii) On very strong heating the substance gives black residue which is of copper(II)oxide.

(B)

Prepare a solution of the given substance in water and perform the following experiments with different portions of the solution.

(B-1)

To the first portion of the solution, add NaOH solution drop by drop and then in excess. Record your observation, name the cation and give your deduction.

(1) **Observation:**

(i) On adding NaOH, a blue precipitate is obtained.

(ii) The blue precipitate is insoluble in excess of NaOH.

(2) **Name of the cation:** copper (Cu^{2+})

(3) **Deduction:** The blue precipitate obtained is of copper hydroxide. On heating the blue precipitate a black precipitate is obtained which is of copper(II)oxide (CuO).

(B-2)

To the second portion of the solution add NH_4OH solution drop by drop and then in excess. Record your observations and give your deduction.

(1) **Observations:**

(i) On adding NH_4OH drop by drop, a bluish white precipitate is obtained which dissolves in excess NH_4OH forming deep blue colour (Prussian blue).

(2) **Deduction:**

(i) The bluish white precipitate is of copper hydroxide.

(ii) Deep blue colour of the solution is obtained on adding excess NH_4OH due to the formation of tetraamminecopper(II) sulphate.

(B-3)

To the third portion of the solution, add a few drops of dilute HCl and then add barium chloride solution ($BaCl_2$). Make your observation, name the anion and give your deduction.

(1) **Observations:**

(i) On adding barium chloride, a thick white precipitate is obtained.

(ii) Precipitate is insoluble in dil. HCl.

(2) **Name of the anion: Sulphate ion** (SO_4^{2-})

(3) **Deduction:** The given substance is hydrated copper sulphate salt.

EXPERIMENT No. 5

(A)

Prepare the aqueous solution of the given substance, divide it into three parts and perform the following experiments.

(A-1)

To the first part of the solution add NaOH drop by drop and then in excess. Make your observations, name the cation and give your deduction.

(1) **Observation**:

(i) The original solution is pale green in colour.

(ii) On adding NaOH drop by drop, a dirty green precipitate is obtained.

(iii) On adding excess NaOH, dirty green precipitate does not dissolve.

(2) **Name of the cation**: Ferrous ion (Fe^{2+})

(3) **Deduction**:

(i) Dirty green precipitate is obtained due to the formation of ferrous hydroxide.

(ii) The given salt is a ferrous salt.

(A-2)

To the second part of the solution, add 4-5 drops of concentrated nitric acid and boil. Add NaOH to it. Make your observations, name the cation and give your deductions.

(1) **Observation**:

(i) On boiling the original solution with concentrated nitric acid, it turns brownish yellow.

(ii) On adding NaOH solution, reddish brown precipitate is formed.

(iii) On adding excess NaOH, the precipitate does not dissolve.

(2) **Name of the cation**: Ferric (Fe^{3+})

(3) **Deduction**: On boiling the solution with concentrated nitric acid, it becomes brownish yellow because ferrous is oxidized to ferric. On adding NaOH solution reddish brown precipitate is obtained due to the formation of ferric hydroxide.

(A-3)

To the third part of the solution, add a few drops of dil. HCl and barium chloride solution. Make your observations, name the anion and give your deduction.

(4) **Observation:**

On adding barium chloride, a thick white precipitate is obtained which is insoluble in dil. HCl

(5) **Name of the anion**: Sulphate ion (SO_4^{2-})

(6) **Deduction:** The white precipitate is of barium sulphate and the salt provided was of ferrous sulphate.

EXPERIMENT No. 6

(A)

Take a small amount of the given salt in a clean test tube and add dil. HCl. Make your observations, identify the gas evolved, name the anion and give your deduction.

(1) **Observations:**

(i) On adding dil. HCl to the given salt, a gas is evolved with brisk effervescence.

(ii) The gas is colourless and odourless

(iii) The gas turns blue litmus red, hence it is acidic in nature.

(iv) The gas turns limewater milky but has no effect on acidified $K_2Cr_2O_7$ solution.

(2) **Identification of the gas evolved**: The evolved gas is carbon dioxide.

(3) **Name of the anion**: Carbonate ion (CO_3^{2-})

(4) **Deduction:** The given salt is a carbonate salt.

(B)

To a little portion of the solution obtained on adding dil. HCl to the given salt, add NaOH solution drop by drop and then in excess. Make your observations.

(1) **Observations:**

(i) On adding NaOH solution drop by drop, a white precipitate is obtained.

(ii) In excess of NaOH, the precipitate does not dissolve.

(C)

To a little portion of the solution obtained in (A) i.e. on adding dil. HCl to the given salt, add NH_4OH solution drop by drop and then in excess. Make your observations, name the cation and give your deduction.

(1) **Observation**:
On adding NH_4OH, no precipitate is formed.

(2) **Name of the cation**: Calcium ion (Ca^{+2})

(3) **Deduction**:

(i) On adding NaOH to the salt solution, white precipitate of calcium hydroxide is formed, but there is no precipitate formed on adding NH_4OH solution.

(ii) The given salt is calcium carbonate.

EXPERIMENT No. 7

(A)

Take a small amount of the substance in a clean dry hard glass test tube and heat it strongly. Record your observations, identify the gas evolved and give your deduction.

(1) **Observation:**

(i) Heavy, white crystalline solid, on strong heating, crumbles with a crackling noise.

(ii) It gives off a reddish brown gas, which turns moist blue litmus paper red.

(iii) When a glowing wooden splinter is held in the reddish brown gas, it relights showing the presence of oxygen.

(iv) The residue is reddish brown when hot. On cooling, it changes to yellow, partly fuses in glass, and stains it yellow.

(2) **Identification of the gas evolved**:

(i) The gas is reddish brown in colour having an irritating odour.

(ii) It turns moist blue litmus paper red.

(iii) It turns starch iodide paper from colourless to blue-black.

(iv) It turns green acidified ferrous sulphate solution brown.

Thus, the gas evolved is Nitrogen Dioxide (NO_2).

(B)

Take a small amount of the salt in the test tube, add conc. H_2SO_4 and warm gently. Make your observation, name the anion and give your deduction.

(1) **Observation:**

(i) Reddish brown fumes evolve.

(ii) The fumes become thick on adding copper turnings.

(2) **Identification of the gas evolved**: The gas evolved is nitrogen dioxide.

(3) **Confirmatory test of the anion**: To the aqueous solution of the salt, add freshly prepared ferrous sulphate solution, then cautiously pour a few drops of conc. H_2SO_4 along the side of the test tube. A brown ring appears at the junction of the two liquids. The brown ring disappears on shaking.

(4) **Name of the anion**: Nitrate ion (NO_3^-)

(5) **Deduction**: The given substance is a nitrate salt

(C)

To the salt solution, add NaOH solution drop by drop and then in excess, record your observation and give your deduction

(1) **Observation:**

(i) On adding NaOH drop by drop a thick white precipitate is obtained

(ii) On adding excess NaOH the white precipitate gets dissolved and a clear solution is obtained.

(2) **Deduction**: The thick white precipitate is of lead hydroxide. It dissolves in excess of NaOH due to the formation of sodium plumbite (Na_2PbO_2).

(D)

To the salt solution, add NH_4OH solution drop by drop and then in excess. Record your observation and give your deduction.

(1) **Observation**:

(i) On adding NH_4OH drop by drop, a white ppt. is obtained which remains insoluble in excess NH_4OH.

(2) **Deduction**:

(i) The white ppt. is of lead hydroxide.

(ii) The given salt is lead nitrate.

EXPERIMENT No. 8

Take the salt in a clean, dry, hard test tube and heat it strongly. Make your observation and give deduction.

(1) **Observation**:

(i) Bluish green crystalline solid, on heating, melts to form a bluish green mass and gives off steamy vapours that condense on the cooler parts of the test tube to form droplets of water.

(ii) On further heating, the bluish green mass changes to a black residue, i.e. copper (II) oxide.

(iii) It gives off a reddish brown gas.

(iv) It also gives a gas that rekindles a glowing splinter, i.e. oxygen.

(2) **Deduction** :

(I) The residue obtained is of copper (II) oxide.

(II) Gases evolved are Water vapour, nitrogen dioxide and oxygen.

(III) The given substance is copper (II) nitrate hexahydrate.

Experiment No. 9

You are given a solution. Determine whether it is acidic or basic in nature by giving three tests.

(1) **Observation:**

(a) When the solution is tested with red litmus paper, it remains unchanged and when it is tested with blue litmus paper, it is turned red.

(b) When the given solution is tested with phenolphthalein solution, it remains colourless i.e. the colour of the phenolphthalein solution does not change. (c) It turns methyl orange solution (orange in colour) pink.

(2) **Deduction:** As the given solution turns blue litmus paper red, phenolphthalein solution remains unchanged and methyl orange solution is turned pink, it proves that the given solution is acidic in nature.

Experiment No. 10

You are given a solution. Determine whether it is acidic or basic in nature by giving three tests.

(1) **Observation:**

(a) When the solution is tested with blue litmus paper, it remains unchanged and when it is tested with red litmus paper, it is turned blue.

(b) When the given solution is tested with phenolphthalein solution, it turns pink. (c) It turns methyl orange solution (orange in colour) yellow.

(2) **Deduction:** As the given solution turns red litmus paper blue, phenolphthalein solution pink and methyl orange solution is turned yellow, it proves that the given solution is basic in nature.

END

Girls' High School and College, Prayagraj

Session 2021-22

Class 10 (A,B,C,D & E)

Biology Practical

Instructions:

Parents are expected to ensure that the child completes the work in her Biology Practical file of class 10.

All experiments are to be neatly written with a blue pen only however the students can use a black pen for headings. The diagrams related to the experiments should be neat ,well labelled and drawn on the plain side. Diagrams should be labelled only with a pencil. Each experiment should start from a fresh page. No colours are to be used either for written work or for diagrams.

EXPERIMENT No 1

Aim-To study the different stages of Mitotic cell division in Plant cells.

Materials required- Microscope and permanent glass slides showing different phases of mitosis.

Method- Focus permanent glass slides showing different stages of mitosis under the microscope.

Observation- Mitosis involves two main stages; karyokinesis (division of nucleus) and cytokinesis (division of cytoplasm).

The following phases of karyokinesis are observed in the given permanent slides.

1.**Prophase**-

(I)The chromosomes begin to coil and become shorter and thicker.

(ii)Each chromosome is in a duplicated form and consists of two sister chromatids.

(III)The two sister chromatids are attached to each other at a small region called centromere.

(iv)The nuclear membrane and the nucleolus disappear.

(v)Spindle Fibres (formed by microtubules) appear.

2. **Metaphase**

(I)The duplicated chromosomes arrange on the equatorial plane .

(ii)Each chromosome gets attached to the spindle fibre by its centromere.

3. Anaphase

(I)The centromere attaching the two chromatids divides.

(ii)The two sister chromatids of each chromosome separate and are drawn apart towards opposite poles due to contraction of spindle fibres.

4. **Telophase**

(I)The chromatids form two groups, one on either pole of the spindle.

(ii)Each chromatid or daughter chromosome uncoils and forms thin thread like chromatin fibre.

(III)Spindle fibres disappear.

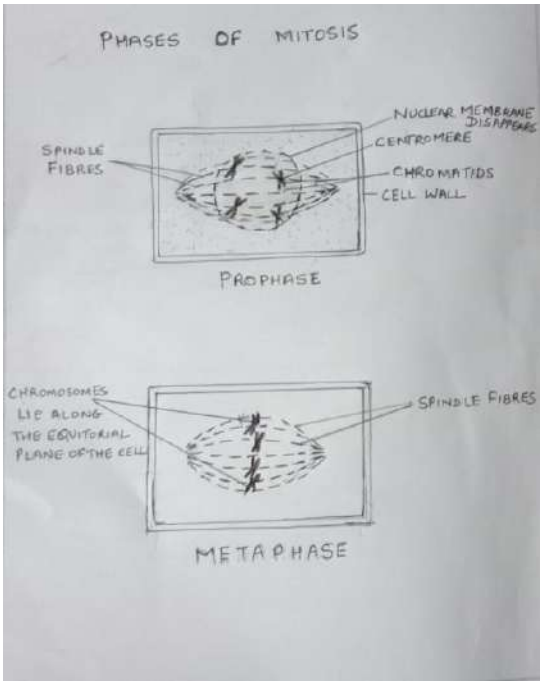
iv)Nuclear membrane reappears.

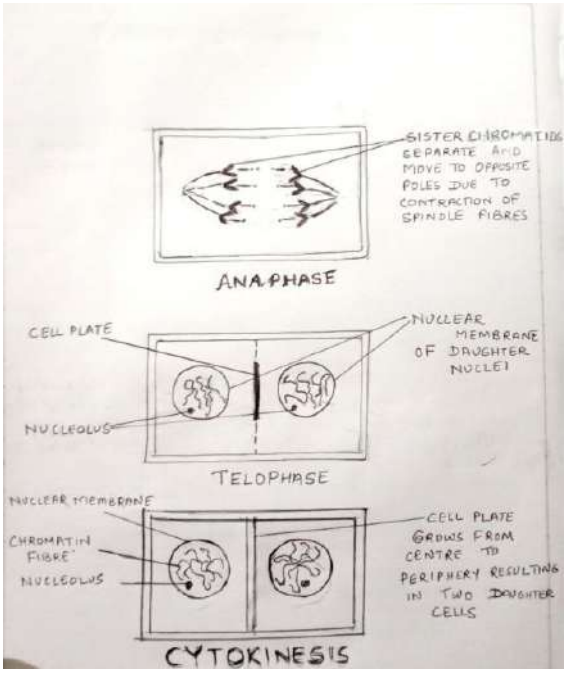
(vi)Nucleolus reappears in each daughter nucleus.

(vi)A cell plate is laid down in the cytoplasm at the equatorial plane

Cytokinesis

The cell plate grows from the centre to the periphery and finally divides the cell into two daughter cells.





EXPERIMENT No. 2

AIM-To study the diffusion of potassium permanganate crystals in water.

Materials required-A beaker,water and potassium permanganate crystals.

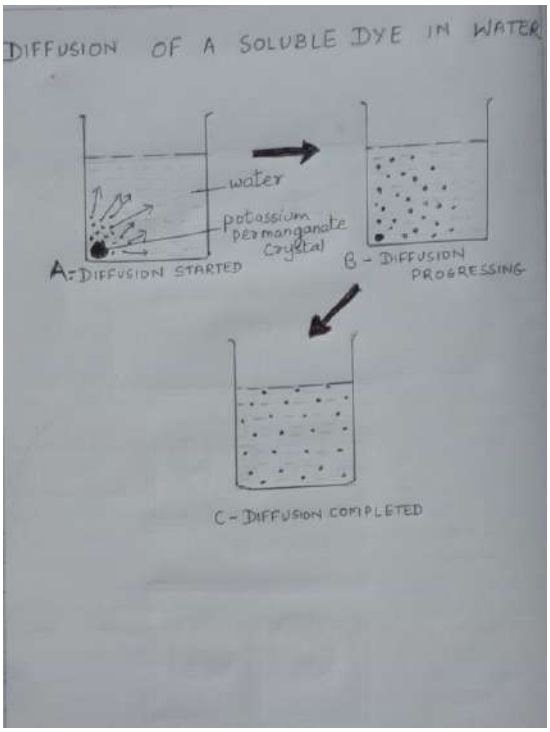
Method-Take a beaker containing water.Drop a small crystal of potassium permanganate in one corner of the beaker. Observe for some time.

Observation-We observe that the potassium permanganate crystal slowly start dissolving.

The molecules of potassium permanganate move from a region of their higher concentration to a region of their lower concentration.

After some time the molecules of potassium permanganate distribute uniformly throughout water.

Conclusion-This experiment shows that the molecules of potassium permanganate are diffused ,or uniformly distributed throughout water.



EXPERIMENT No. 3

AIM-To study Osmosis using potato osmoscope.

Materials required-A large sized potato , beaker,knife, water and 25% sugar solution.

Method-Take a large sized potato.Peel off its skin and make its base flat.

Make a rectangular cavity in the centre of the potato.

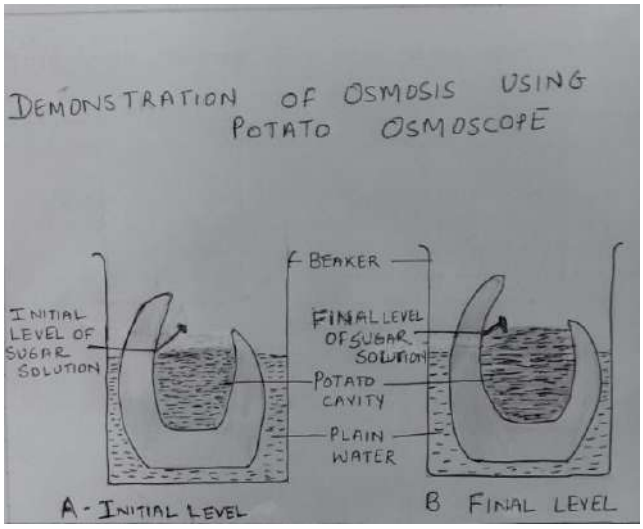
Fill the cavity of the potato with 25% sugar solution .

Mark the initial level of sugar solution in the cavity of the potato,with the help of a pin.

Place the potato in a beaker containing plain water.Leave it for 2-3 hours.

Observation-The level of sugar solution in the potato osmoscope rises.

Conclusion-The sugar solution in the osmoscope is separated from pure water by means of potato tuber cells.Each cell of potato has a cell wall which is permeable,and a plasma membrane which is a semi permeable membrane .Water enters the cell due to osmosis.Cell to cell osmosis results in the entry of water in the osmoscope and so the level of sugar solution in the potato osmoscope rises.



Experiment 4

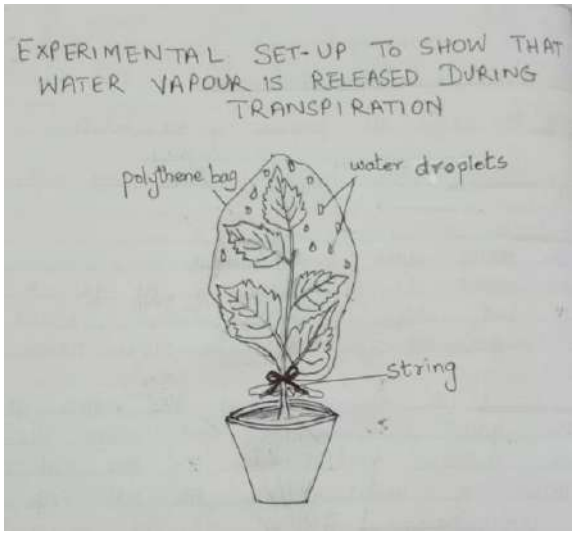
Aim-To show that water vapour is given out during Transpiration.

Materials required-A small-sized, well- watered potted plant,a polythene bag and a string.

Method—Take a small sized ,well-watered potted plant.Cover the plant with the help of a transparent polythene bag and tie its mouth at the base of the stem.Leave the set-up undisturbed for 2-3 hours in sunlight.

Observation-Drops of water appear on the inner side of the polythene bag tied around the plant.

Conclusion- Drops of water that appear on the the inner side of polythene bag are due to saturation of water vapour given out by the leaves .This shows that water vapour is given out during Transpiration.



Experiment No.5

Aim-To show that more transpiration occurs from the lower surface of a dicot leaf.

Materials required-A well-watered potted dicot plant, two pieces of cobalt chloride paper(2x4sq cm),

two glass slides and some paper clips.

Method-Take a well- watered potted dicot plant.

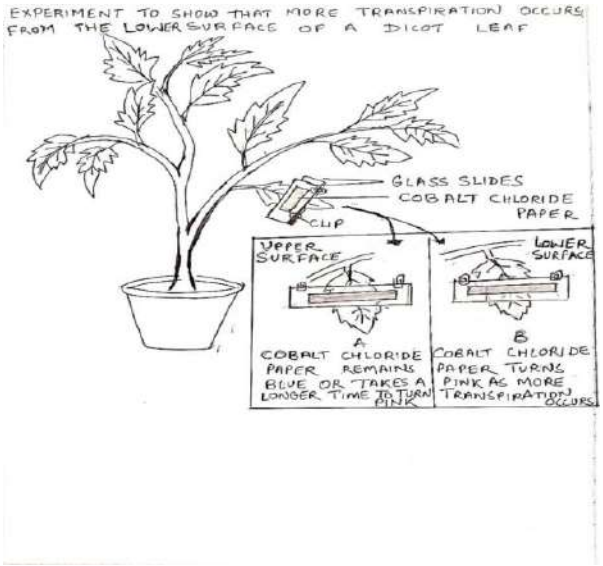
Place one piece of cobalt chloride paper over a glass slide and hold it on the lower side of the leaf and the other paper on the upper side of the leaf in a similar manner.

Fasten both slides with the help of paper clips.

Observe for about an hour.

Observation-The piece of cobalt chloride paper on the lower surface of the leaf turns pink very fast while the paper on the upper surface remains blue or takes a longer time to turn pink.

Conclusion-This experiment shows that more transpiration takes place from the lower surface of the leaves of dicot plants than from the upper surface .This is because in a dicot leaf more stomata are present on the lower surface than on the upper surface.



Experiment No 6

Aim-To show that light is necessary for photosynthesis.

Materials required-A well- watered potted plant , strips of black chart paper and paper-clips.

Method-Take a well -watered potted plant and destarch its leaves by keeping it in dark for two days.

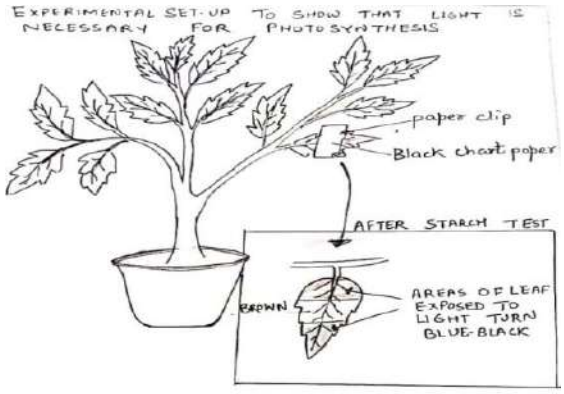
Take strips of black paper and cover both the upper and lower surfaces of a leaf.Clip the strips tightly.

Leave the set-up in sunlight for4-6 hours.

Detach the leaf and test it for the presence of starch.

Observation-It is observed that only those parts of the leaf that could get light turn blue -black showing the presence of starch in it.

Conclusion-This experiment shows that light is essential for photosynthesis.



Experiment No.7

Aim-To show that carbon dioxide is essential for photosynthesis.

Materials required-A well watered potted plant,conical flask,split cork,potassium hydroxide and a stand.

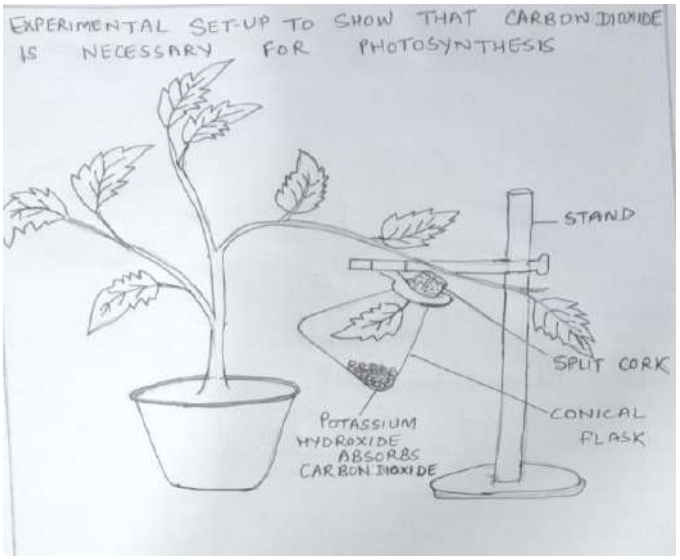
Method-Take a well-watered potted plant and destarch its leaves by keeping it in dark for about two days.Take a conical flask and put some potassium hydroxide in it.Potassium hydroxide absorbs carbon dioxide.Insert one leaf into the conical flask through a split cork.

Leave the set-up in sunlight for 2-3 hours.

After 2-3 hours take out this leaf from the conical flask and pluck it from the plant.Take one more leaf from the same plant .Test both these leaves for the presence of starch

Observation-The leaf inserted in the conical flask does not turn blue-black when tested for starch with iodine solution while the one that was exposed to atmospheric air turns blue-black.

Conclusion-This experiment shows that carbon dioxide is necessary for photosynthesis.



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Experiment No.8

Aim -To show that oxygen is produced during photosynthesis

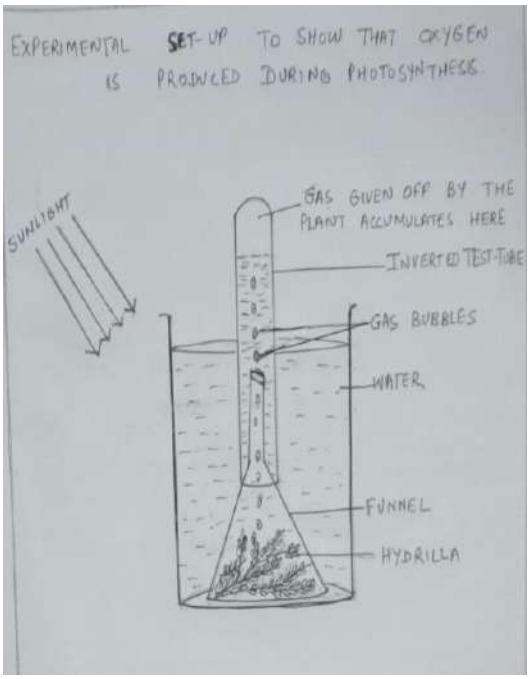
Materials required-A beaker,a conical flask ,a test tube,water and some aquatic plants such as hydrilla.

Method- Take some aquatic plants such as hydrilla in a beaker containing water and cover them by a short- stemmed funnel.

Invert a test-tube full of water over the stem of the funnel.Place the set -up in sunlight for a few hours.

Observation- Bubbles of the gas arise from the plants.These bubbles rise upwards and collected in the test -tube .On testing this gas with the help of a glowing wooden splinter we find that the wooden splinter bursts into flame,showing the presence of oxygen in the test tube.

Conclusion- This experiment shows that oxygen is produced during photosynthesis.



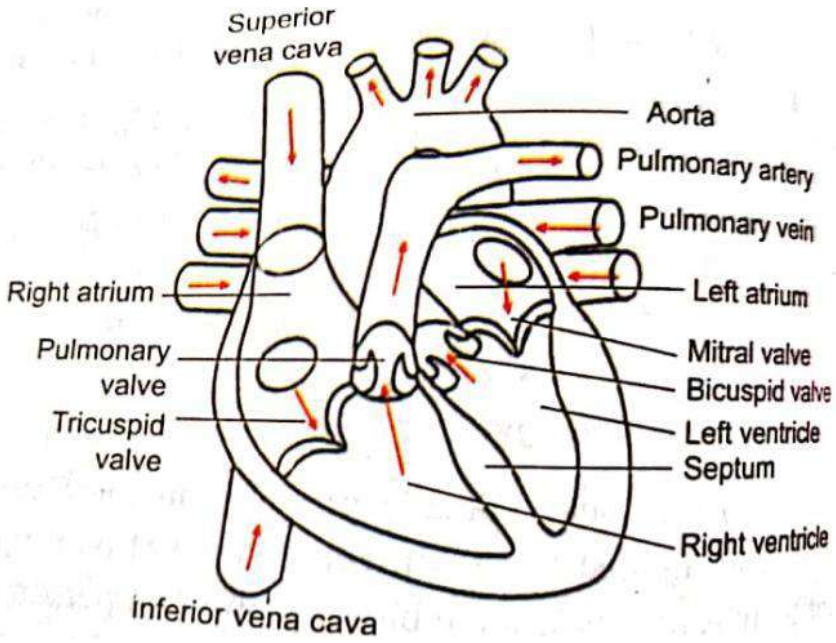
Experiment No 9

Aim-To study the internal structure of the human heart.

Observation-The human heart is four chambered.It consists of two auricles and two ventricles.The auricles are demarcated from the ventricles by an irregular groove , the coronary sulcus.

Auricles-The upper two chambers of the heart are the auricles.The two thin walled auricles are separated by a thin interauricular septum.The right auricle receives deoxygenated blood from the upper part of the body by superior vena cava and from the lower part of the body by the inferior vena cava. The left auricle receives oxygenated blood from lungs by two pairs of pulmonary veins.The left auricle sends blood to the left ventricle through the bicuspid valve present at the left atrio- ventricular aperture.The right auricle sends deoxygenated blood to the right ventricle through the triicuspid valve present at the right atrio- ventricular aperture.

Ventricles-The lower two chambers of the heart are the ventricles.The two thick walled ventricles are separated by a thick and obliquely placed interventricular septum.The left ventricle receives oxygenated blood from left auricle and sends it to entire body through Aorta.The right ventricle receives deoxygenated blood from right auricle and sends it to the lungs through pulmonary artery.



Experiment No 10.

Aim- To study the the excretory system in human beings.

Observation- In human beings, excretory system consists of

1. **Kidneys**- Kidneys are reddish brown, bean shaped structures. Each kidney is about 10 cm long and 6 cm broad. The left kidney is placed slightly higher than the right one because liver
2. Displaces the right kidney somewhat downward. The inner margin of kidney is concave and has a notch, called hilum. It is the place from where the ureter and renal vein come out of kidney and renal artery enters.
3. **Ureters**- Each ureter arises from the notch of kidney at hilum. It's anterior part is funnel shaped and is called pelvis. Ureter enters into the urinary bladder by a slit like aperture.
4. **Urinary bladder**- The urinary bladder is a pear shaped sac with muscular contractile wall. It lies in the pelvic region and stores urine till it is excreted. The neck of the urinary bladder is surrounded by a sphincter.

5. **Urethra**- The urethra is a membranous tube that arises from the neck of the urinary bladder.

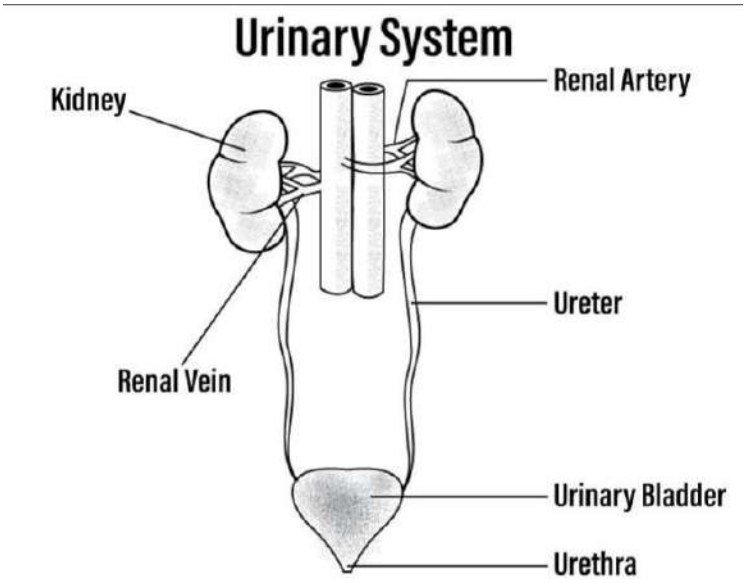
Internal structure of a kidney

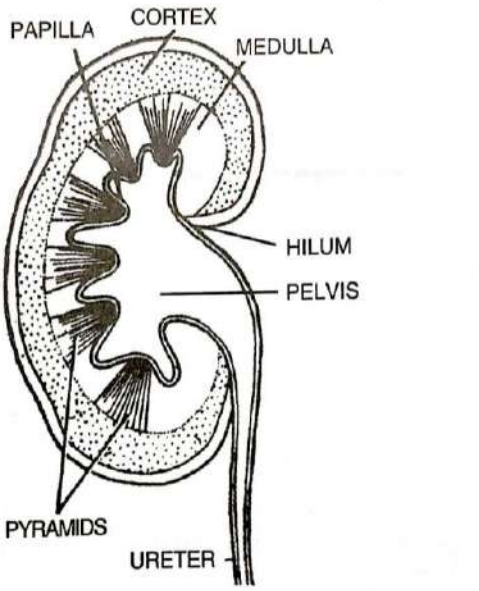
The kidney consists of two regions:the cortex and the medulla.

Cortex-It is the outer dark region of the kidney.It contains Bowman's capsule, and proximal and distal convoluted tubules of uriniferous tubules.

Medulla- It is the inner lighter region of the kidney.It is composed of Henle's loops of uriniferous tubules and collecting ducts.They appear as fine stripes. They are organised into several conical pyramids.

Towards the concave side of the kidney is a funnel shaped cavity called renal pelvis,from where the ureter starts.A number of projections of medulla extend into the renal pelvis as renal papillae





A kidney in longitudinal section

Experiment No 11.

Aim -To study the external structure of the human brain.

Observation-The human brain is enclosed in a bony case called cranium,which protects it from injuries. The brain is wrapped in three protective membranes called meninges which are separated by cerebrospinal fluid.

The brain is divided into forebrain,midbrain and hindbrain.

Forebrain-It consists of cerebrum and diencephalon.

(i)Cerebrum-The cerebrum is the largest and most prominent part of the brain.It is formed of right and left cerebral hemispheres.The two cerebral hemispheres are connected ventally by a thick band of nerve fibres,called corpus callosum.

(ii)Diencephalon-The diancephalon mainly consists of thalamus,hypothalamus and two endocrine glands – pineal gland and pituitary gland.

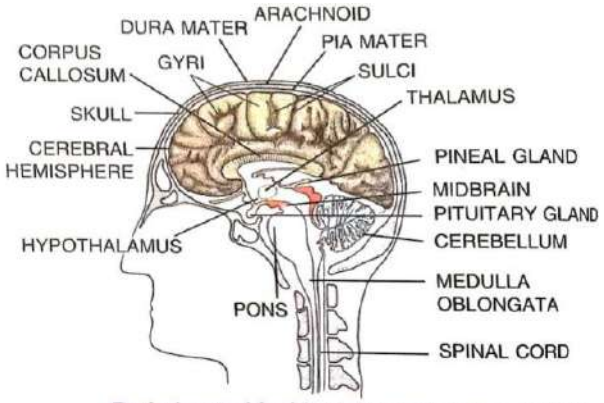
Midbrain-The midbrain has groups of nerve fibres which connect the forebrain and hindbrain.It also has four optic lobes which are centres of vision.

Hindbrain-The hindbrain consists of cerebellum,pons varoli and medulla oblongata.

(I)Cerebellum-Thecerebellum is the second largest part of the brain but much smaller than the cerebrum.It lies at the rear of the cerebrum partly covered by it.

(ii)Pons varoli-It is a thick transverse nerve tract in the undersurface of the cerebellum and connects its two hemisphere.

(III)Medulla oblongata-Medulla is the posterior -most part of the brain and is also known as the brain stem.The medulla continues into the trunk as spinal cord.



Brain located inside the head (sectional view)

Experiment No 12

Aim To study the structure of the human eye.

Observation-The eyeball is nearly spherical and is about about 2.5 cm in diameter.Its wall is composed of three layers:sclera ,choroid and retina.

1 . **Sclera or Sclerotic**

It is the outermost white layer of the eyeball. It is made up of tough fibrous tissue .The front portion of the sclerotic buldges out and becomes transparent in the front region ,this part is called the cornea.

2 . **Choroid**

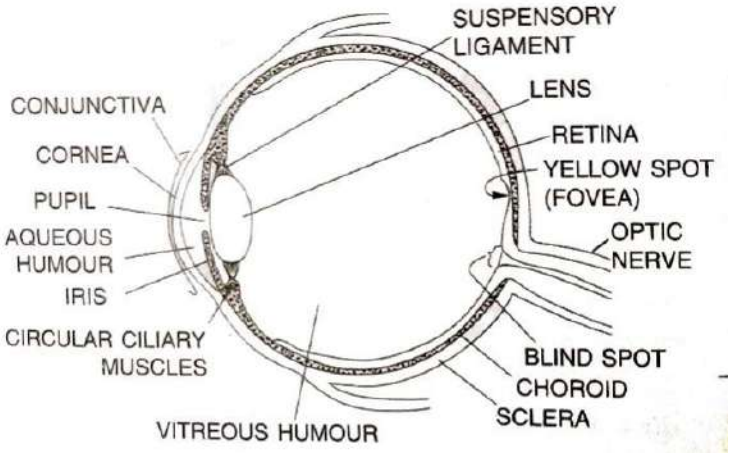
The Choroid layer is the middle layer of the eye.It is thin,highly vascular and deeply pigmented.In the front of the eye, the choroid expands to form ciliary body .The Iris is also an extension of the Choroid,partially covering the lens and leaving a circular opening in the centre,the pupil.The lens lies just behind the pupil and the Iris.The lens is biconvex,elastic and non-vascular structure.The lens divides the cavity of thee eyeball into two chambers.

(I)The Aqueous Chamber:It lies in front of the lens and is filled with a clear watery fluid called Aqueous humour.

(ii)The Vitreous Chamber:It lies behind the lens and is filled with viscous jelly like Vitreous humour.

3 . **Retina** -The retina is the innermost layer,sensitive to light.It contains two types of cells called rods and cones.

Rods are sensitive to dim light and the cones are sensitive to bright light.



Internal structure of human eye

Experiment No 13

Aim- To study the internal structure of the human ear.

Observation-Ear is the organ of hearing and balance.The human ear consists of three parts,outer ear, middle ear and inner ear.

1. Outer ear

The outer ear consists of the the projecting part called pinna and the auditory canal leading to the ear drum.

2. Middle ear

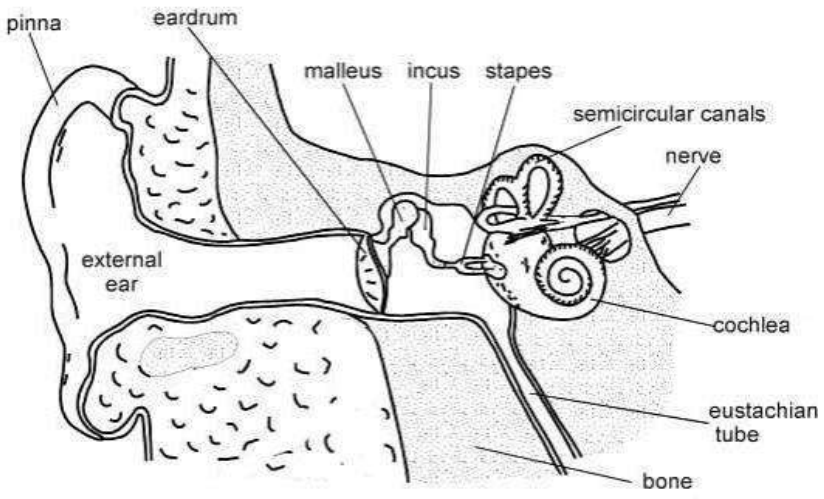
The middle ear contains three tiny bones -malleus ,incus and stapes (or hammer , anvil and stirrup in popular terms)and an eustchain tube which connects the cavity of the middle ear with the throat.hee three bones are collectively called the ear ossicles The handle of the hammer bone is attached to the inner surface of the ear drum.Its opposite end is attached to the anvil which, in turn, is joined to the stirrup The flat part of the stirrup fits on the oval window, a membrane -covered opening leading to the inner ear.A second opening, the round window,also covered by a thin membrane,connects the middle ear to the inner ear.

3. Inner ear

The inner ear or membranous labyrinth has two main parts– The cochlea and the semicircular canals. The cochlea is spiral shaped and looks like a snail shell. Its inner winding cavity is divided into three parallel canals separated by two membranes. The median (cochlea) canal is filled with a fluid called endolymph and the other two with perilymph . The middle canal consists areas possessing sensory cells, spiral organ called organ of Corti for hearing. The nerve fibres arising from these cells join the auditory nerve.

The other part of the inner ear consists of a set of three semicircular canals which are arranged at right angles to each other in three different planes so that one is horizontal and the other two are vertical. One end of each canal is swollen to form an ampulla which contains sensory cells (for dynamic balance).

The short stem joining the bases of semicircular canals to the cochlea shows two parts – A utriculus and a sacculus. These parts also contain sensory cells which are associated with static balance.



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GIRLS' HIGH SCHOOL AND COLLEGE, PRAYAGRAJ

PROJECT WORK

SESSION 2021-2022

CLASS 10 C, D, E

SUBJECT: COMPUTER APPLICATIONS

Reference Book: LOGIX Class 10 (KIPS Publications)

INSTRUCTIONS: The students are expected to write 25 programs in java. The sequence of the programs will be as follows:

1. 3 programs based on if-else.
2. 2 programs based on switch case.
3. 3 programs on looping structure(e.g.: factorial, reverse of a number, sum of the digits of number, count and display divisors, Fibonacci series, etc).
4. 3 programs on nested loop (patterns and series).
5. 4 programs on numbers (eg: prime, Armstrong, automorphic, pronic, composite, palindrome, kaprekar, etc.).
6. 2 programs on method overloading.
7. 2 programs on String (Palindrome, Piglatin, Alphabetical order of characters, extracting vowels from string, counting number of words, etc.).
8. 4 programs based on Single dimensional array (linear search, binary search, bubble sort, selection sort).
9. 2 programs on Double Dimensional array (sum of the elements, display left and right diagonal, display lower and upper triangle of matrix, etc.).

Instructions for writing the project

- The students are expected to execute the above programs on the computer system on BlueJ.
- Write the executed programs on interleaf punched papers.
- The programs are to be written on ruled side and the variable descriptions on the blank side.
- Format of Variable Description:

Name of the variable	Data type	Purpose/Description

- The project is to be written with blue pen and the headings with black pen.
- The project is to be preceded by acknowledgement and index.

- The format of index is :

S. No.	Program	Page No.	Remark

- No bibliography is required.

-----END-----

Girls' High School & College, Prayagraj

Session: 2021 - 2022

Class: 10 B , C

Subject: Commercial Applications

Project

Note: ***Parents are expected to ensure that the student should go through all the instructions given below before making the project.***

INSTRUCTIONS:

1. There will be **four separate assignments (Project)** as per the topics given below.

2. Start with **Acknowledgement**, should be of one page, short and simple. Also write your name, class , section and roll no. below it. Don't make separate acknowledgement for each topic. There should be **only one common acknowledgement.**

3. ***Order of each Assignment:***

- Name of the topic (one page)
- **Index** (only serial no. , content and page no. , should be of one page)
- Subject Matter of the topic (describe the topic with Introduction, relevant headings and sub-headings, supported with pictures/diagrams/graphs/ tables, as per the requirement. Should not be more than 4 to 5 pages.)
- **Conclusion** (one page)
- **Bibliography** (One page. Write the name of relevant websites and books consulted for the making of the assignment.)
- **Note:** Same order will be followed for each assignment.

4. **Each assignment should not be more than 8 to 10 pages** including all the points mentioned above. Don't use vulgar or objectionable pictures.

5. Relevant pictures should be pasted neatly and must be **bordered in black along with labelling or heading.** Use only black and blue pens for writing.

6. Sample assignments are given at the end of the course book. These can be read to understand the topic but **don't copy the matter from here.**

7. Course book, other reference books and relevant websites can be used to find the subject matter of the assignment.

8. Keep all four assignments in one file. Cover the file with pink chart paper. Write **Commercial Applications Project 2021-22 in the middle, and Name, Class, Section, Roll no., Admission no. should be written at the bottom right corner.** Then cover it with cellophane sheet and at the top right corner, paste a white slip (2cm by 6cm, bordered in black) using **fevicol** and leave it blank.

Course Book – ***Commercial Applications Part II by Dr. C.B. Gupta.***

Topics for the Assignments (Project) :

1. Study the marketing strategies of a service sector company such as a Courier service and a Production company such as a pen manufacturer. Explain the differences and similarities in both the strategies. What do you think is the reason for these differences?
2. Study the product life cycle (PLC). Using add-gel pens explain in which part of the PLC are they, giving valid justification.
3. Study five different advertisements in any one media (print, television, audio) of the FMCG (fast moving consumer goods) such as Coke, Pepsi Lux, Surf, Tide etc., and explain their positive and negative points.
4. Write an essay on the role of the Central Bank (Reserve Bank of India) in any economy with special reference to the Indian scenario.

*******END*******

GIRLS' HIGH SCHOOL & COLLEGE, PRAYAGRAJ

SESSION 2021-2022

SUPW PROJECT

CLASS – 10 (A, B, C, D, E)

Instructions- Parents are expected to ensure that the student follows the instructions given below and thereafter makes the SUPW items.

I. Embroidery on two pillow covers (with five different stitches).

REQUIREMENT FOR PILLOW COVERS-

(a) Two pillow covers (any color). Size – 20" x 26"
(b) Standard embroidery cotton thread (embroidery floss).
(c) Embroidery hoop.
(d) Embroidery needles.

II. Glass painting on two drinking glasses/ bottles (should be transparent).

REQUIREMENT FOR GLASS/ BOTTLE PAINTING-

(a) Two glasses/ bottles (transparent).
(b) Glass paint colors (Fevicryl).
(c) Paint brushes
(d) Decorative items like sequins, mirrors, glitter tubes, etc.
(e) Fevicol.

You may refer to the picture as given below.

END