Biology Experiments to be written in Biology Practical File

Biology Practical File
(Nova ICSE Biology-Lab Manual)

Students of Class X as per the requirement of CISCE (ICSE Board), have to make a Practical File in the Subject of Biology.

Instructions to be followed for writing experiments:

(i) On the ruled lined pages: Write the experiment number (as given in the list of experiments to be performed for Session 2021-22); Aim of the experiment; Requirements, Procedure, Observations, Conclusions, Precautions (if any) All these details are described by the publisher (of the Practical File) in the beginning of the file.
(ii) On the blank pages: Draw the diagram/s or table (if any) related to the experiments. Make use of the pencil only for making the diagrams.
(iii) New experiment will start from a new page.
(iv) Do not use any other colour pen in the 'Practical File' except blue pen. You may write headings using black pen.
(v) For reference a sample 'Practical File' made by a student is being attached with.

BIOLOGY PRACTICALS - X

As per the guidelines from the Council (ICSE), the students of Class X are required to perform following experiments for the session 2021-22

Expt -1 To demonstrate the process of diffusion using potassium permanganate crystals.
Expt – 2 To study osmosis with the help of a potato osmoscope.
Expt– 3 To demonstrate the process of absorption of water by roots in plants.
Expt – 4 To compare the rate of transpiration on the two surfaces of a dorsiventral leaf using cobalt chloride paper.
Expt – 5 To show that light is necessary for Photosynthesis.
Expt – 6 To show that oxygen is evolved during photosynthesis.
Expt – 7 To identify the structure of urinary system through models and charts.
Expt – 8 To identify the structure of human heart through models and charts.
Expt – 9 To identify the parts of brain through models and charts.
Expt – 10 To identify the structure the eye through models and charts.
Expt – 11 To identify and draw labelled diagrams of different stages of mitosis from prepared slides.
Expt – 12 To identify different types of human blood cells.

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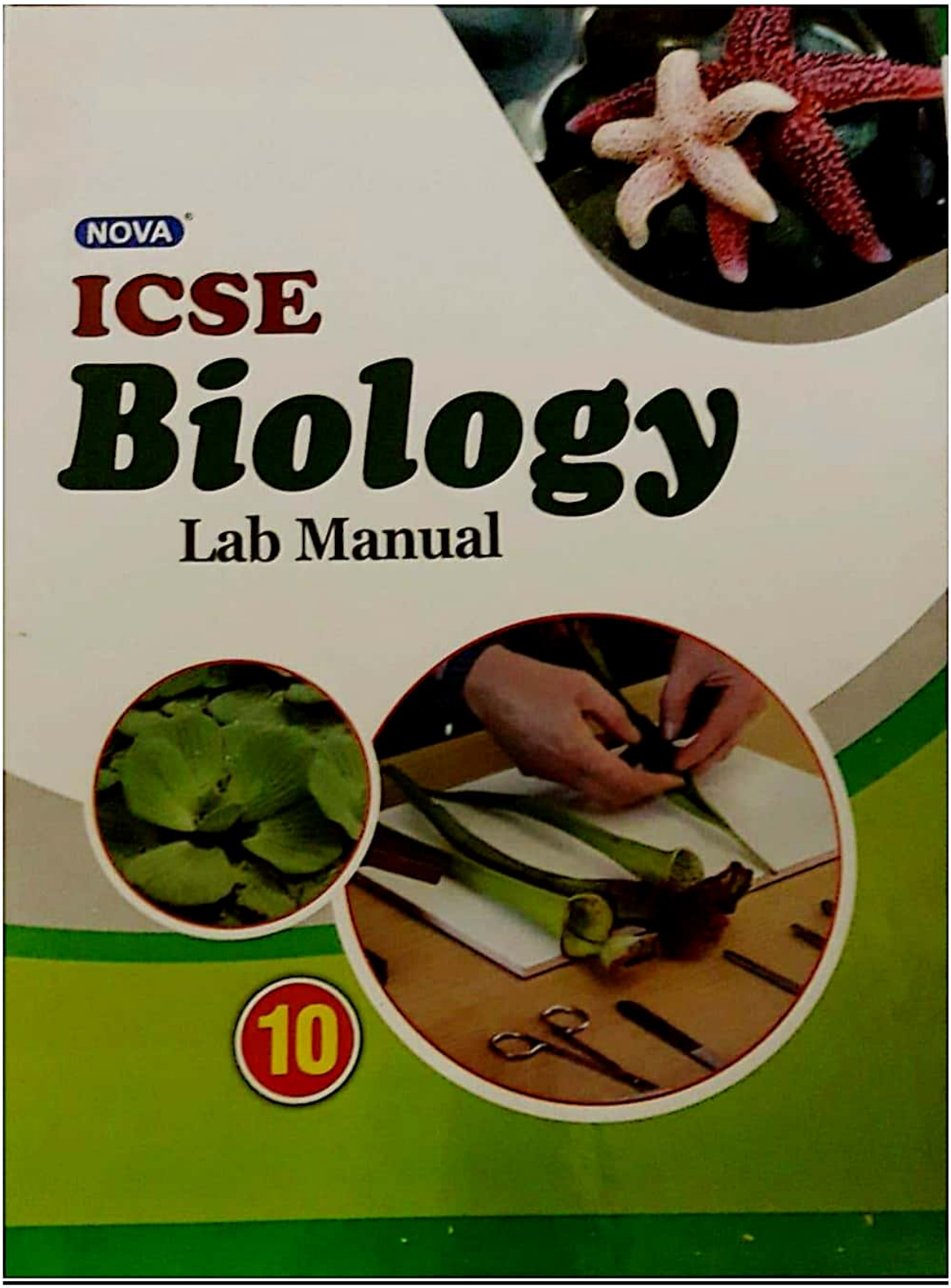

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EXPERIMENT - 1

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AIM :- To demonstrate the process of diffusion by potassium permanganate crystals.

REQUIRMENTS :- Glass Beaker, water, potassium permanganate crystals.

PROCEDURE :- Take a beaker and put clean water into it as shown in the diagram. Drop some crystals of potassium permanganate in it. keep it undisturbed.

OBSERVATIONS :- The molecules of potassium permanganate dissolve in water slowly and (red colour) starts spreading from its higher concentration to lower concentration. Water molecules will also move towards $KMnO_4$ crystals to copy the space. Eventually, the molecules of the water and crystals are evenly diffused and distributed uniformly making the colour of water (solution) homogeneous. It turns purple in colour.

Inference :- (i) In the beginning the molecules of the potassium permanganate are highly crowded and concentrated in and around the crystals.

(ii) The molecules of potassium permanganate diffuse away from the areas of their higher concentration to the areas of lower concentration. That is why the colour of solution in the begining will be intense red near the crystals

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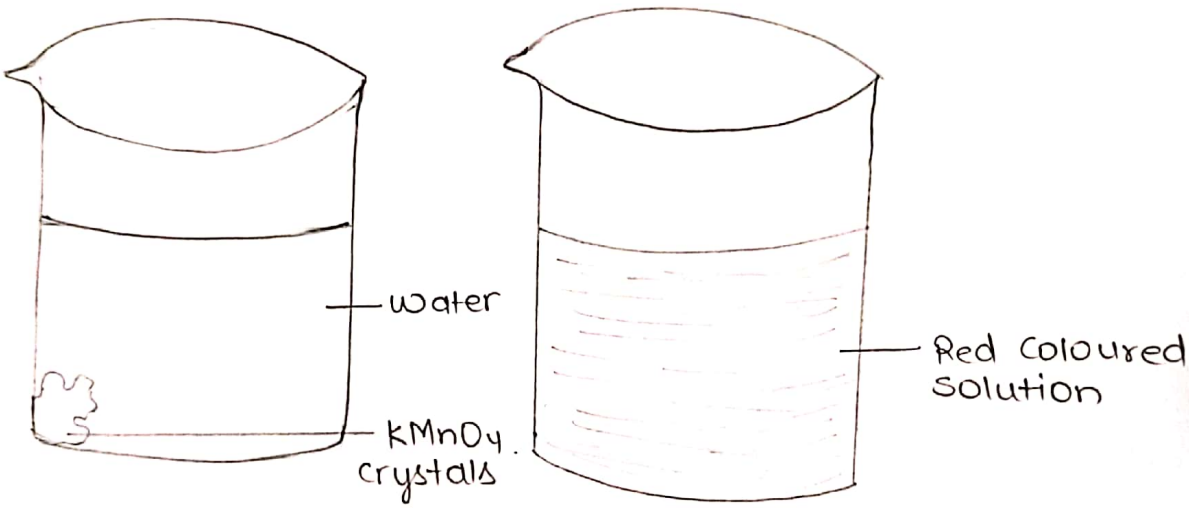
EXPERIMENT -1

AIM:- To demonstrate the process of diffusion by potassium permanganate crystals.



EXPERIMENT TO SHOW THE PROCESS OF DIFFUSION

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and becomes lighter and lighter as we see away from the crystals.

(iii) The movement of water and crystal molecules continues till the solution is homogeneously coloured i.e., till the molecules are evenly distributed in the solution.

DEFINITION :- Diffusion is the movement of molecules of substances till the solution is homogeneously coloured i.e., till the molecules are mixed. It is movement of molecules from a region of higher concentration to the region of lower concentration when they are in contact with each other.

PRECAUTIONS :- (i) Take pure, clean water for the experiment

(ii) Gently place the crystals of potassium permanganate in one corner of the beaker.

(iii) Leave the apparatus undistributed for sometime at room temperature.

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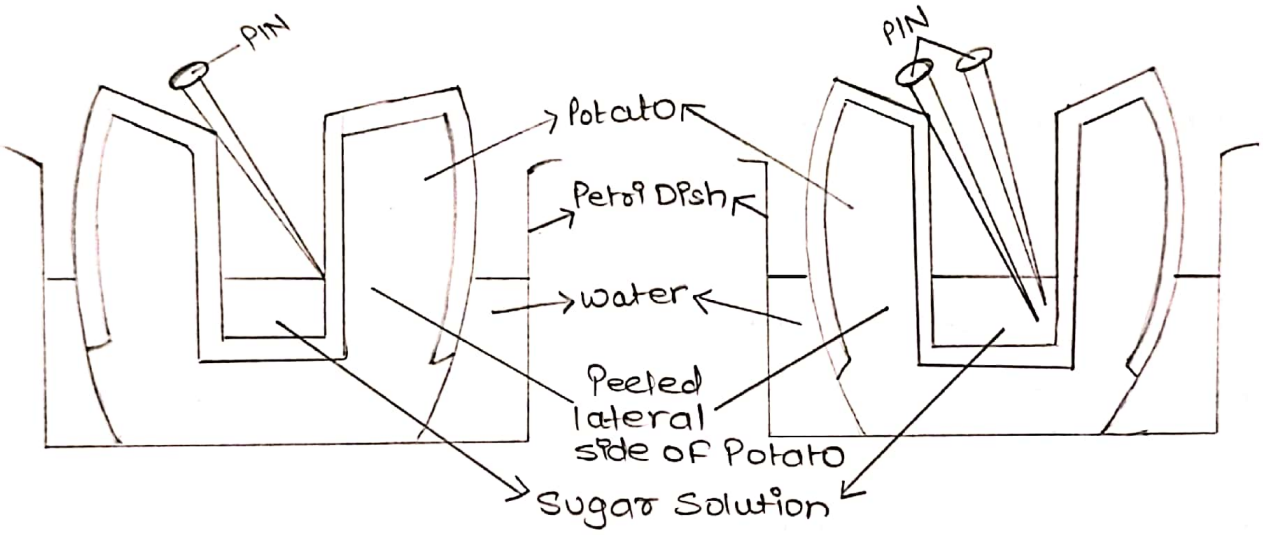
EXPERIMENT-2

AIM: To study osmosis with the help of a potato osmoscope:-



POTATO OSMOSCOPE EXPERIMENT A, ORIGINAL LEVEL ; B, FINAL LEVEL

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EXPERIMENT-2.

07 DEC 2020

AIM :- To study osmosis with the help of a potato osmoscope.

REQUIREMENTS :- A large potato, pins, petri dish, 20% sugar solution, water, a knife or scalpel.

PROEDURE :- Take a large sized potato tuber. cut its one side so as to make it flat. Bore a cavity from the other side in such a way that a very thin base is left intact on the flat side. Remove the skin near the edge of the flat end because skin of the tuber is impermeable to water.

Pour 20% sugar solution in the cavity of the tuber up to one half. Mark the level of sugar solution in the cavity with the help of a pin. Place the tuber on its flat cat end in a petri dish half full of water. Note that after sometime the level of the sugar solution has risen in the cavity. Mark this level also with another pin.

OBSERVATIONS :- The level of sugar solution in the cavity of the potato tuber rises indicating that the solution has absorbed water from the petri dish. The two are seperated from each other by a large number of cells of the tuber. The entry of water into the sugar solution, therefore, prove that :-

(i) Sugar solution is osmotically active.

(ii) The cytoplasm of the cells of the tuber that lies between the sugar solution and the water of the petri dish acts

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as a single semipermeable membrane.

(iii) water enters the sugar solution when it is seperated from it by semipermeable membrane. This process is called osmosis.

DEFINITION :- Osmosis is the movement of water molecules from the region of their higher concentration to the region of their lower concentration through a semipermeable membrane.

PRECAUTIONS :-

(i) The cavity should be deep so as to leave only a thin layer of tissue at the base.
(ii) Remove the skin of the tuber from the base and the sides.
(iii) Make the base flat so as to keep the tuber flat and stable in the dish.
(iv) Sugar solution should be hypertonic compared to cell sap of the tuber cells.

IMPORTANCE OF OSMOSIS :-

(i) It helps the plant to absorb water from the soil.
(ii) It helps in the movement of water from one cell to another in an organism.
(iii) It helps in many types of plant movements like folding and drooping of leaves, opening and closing of stomata etc..

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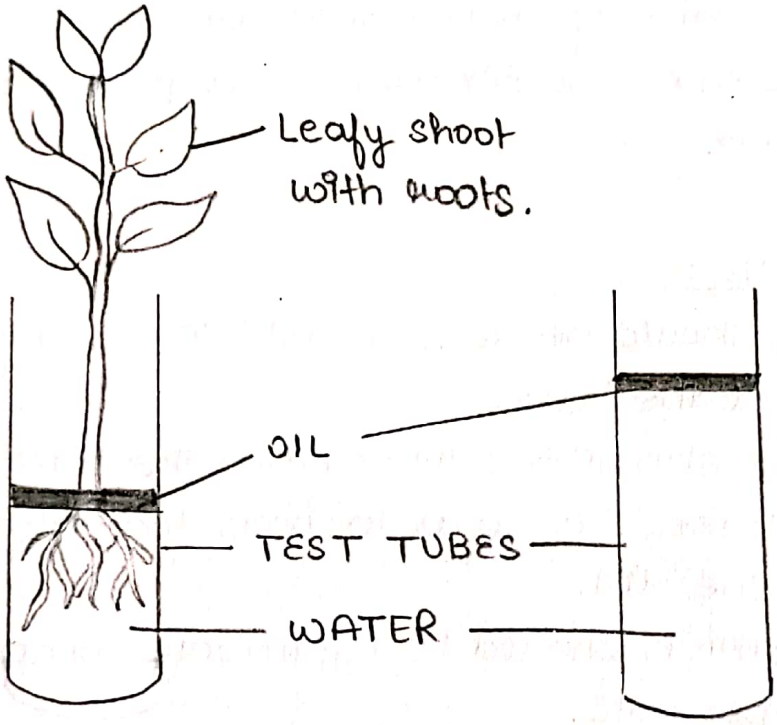
EXPERIMENT - 3

AIM : To demonstrate the process of absorption of water by roots in plants.



EXPERIMENT TO PROVE THAT ROOTS ABSORB WATER

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EXPERIMENT - 3

AIM : To demonstrate the process of absorption of water by roots in plants.

REQUIRMENTS :- Two test tubes, water and freshly uprooted young leafy balsam plant with its roots intact, oil, test tube stand, etc..

PROCEDURE :- Take a test tube filled with water. Pull out a young leafy balsam plant (uprooted) from soil with its roots intact. Soon insert the roots into the test tube. Put a few drops of oil in the test tube (to prevent loss of water by evaporation). Mark the level of water in the test tube. Leave the experimental set up in a test tube stand for a day or two. Set up a similar test tube with water and few drops of oil poured on it but without the plants.

OBSERVATIONS :- The water level in the test tube falls appreciably. Control setup shows that there is no fall in level of water when there is no plant in it.

INFERENCE :- The fall in water level in the test tube proves that water from the test tube is absorbed by the roots and is lost by exposed aerial parts of the plant. Presence of oil in the test tube prevents the loss of water by evaporation.

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PRECAUTIONS :-

(i) A healthy plant with roots intact must be taken.

(ii) Level of water must carefully be noted.

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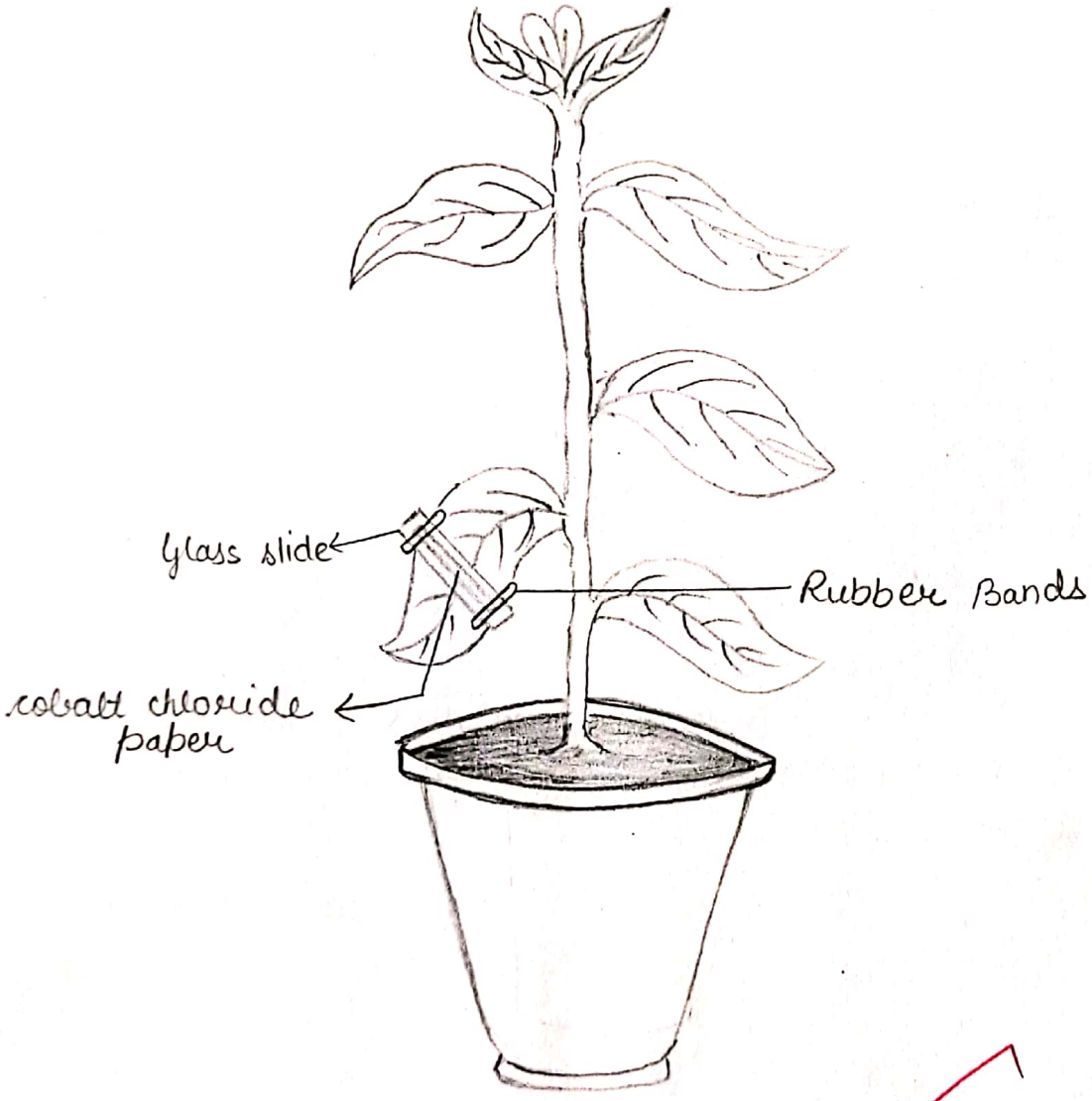
EXPERIMENT - 4

AIM: To compare the rate of transpiration on the two surfaces of a dorsiventral leaf using cobalt chloride paper.



EXPERIMENT TO COMPARE THE RATE OF TRASPIRATION FROM THE TWO SURFACES OF A LEAF

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EXPERIMENT-4

AIM :- To compare the rate of transpiration on the two surfaces of a leaf using cobalt chloride paper.

REQUIREMENTS :- A well watered potted dicot plant, glass slide rubber bands, filter papers, cobalt chloride solution, desiccator and vaseline.

PROCEDURE :- Dip small pieces of filter paper in 5% cobalt chloride solution. Dry them and then keep them in a desiccator till needed. (Cobalt chloride paper is blue when dry and pink when it is moist).

Now select a well watered healthy dicot plant. Clean the upper and lower surfaces of a leaf with dry cotton. Place dry cobalt chloride paper strips on both upper and lower surfaces of the leaf and cover immediately with glass slides and hold the glass slides in position with rubber bands. Smear the edges of glass slides with vaseline. Note the time taken by the cobalt chloride paper strips to change its colour from blue to pink.

OBSERVATIONS :- Observe the cobalt chloride strips. The one on the lower surface turns pink much earlier, within a few minutes whereas the one on the upper surface takes longer time to turn pink. The change in colour of cobalt papers indicate that the papers have received water from the two surfaces of

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a leaf.

CONCLUSION :- The quick change in the colour of cobalt chloride paper on the lower surface. indicates higher rate of transpiration from this surface than from the upper surface. It is due to the presence of more stomata per unit areaon the lower surface than the upper surface.

PRECAUTIONS :-

(i) Use dry foreceps to handle cobalt chloride paper.
(ii) Wipe the leaf surface gently with dry cotton.
(iii) Handle the leaf gently
(iv) Seal the edges of the slide with vaseline completely and gently to make it airtight.
(v) The cobalt chloride paper strips should be dried completely and be kept in desicator till needed.

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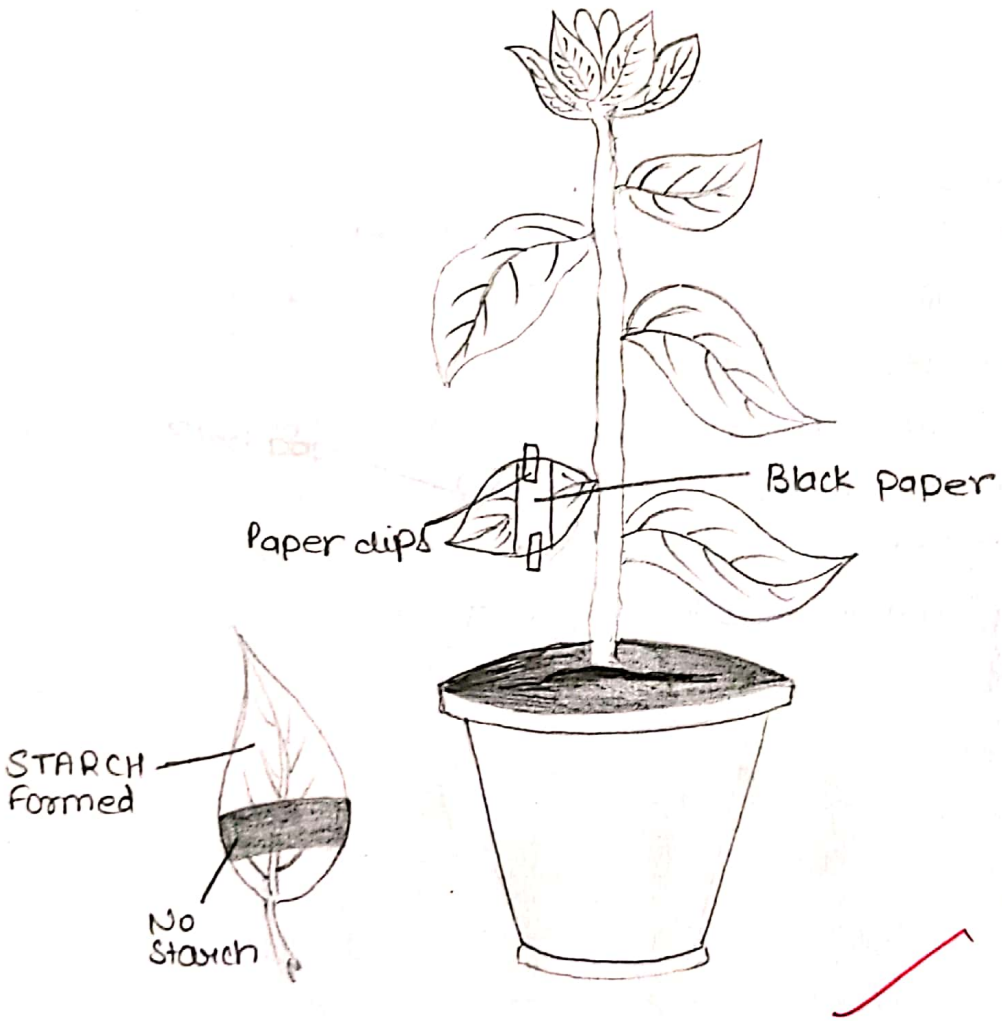
EXPERIMENT-5

AIM:- To show that light is necessary for photosynthesis.



TO DEMONSTRATE THAT LIGHT IS NECESSARY FOR PHOTOSYNTHESIS

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EXPERIMENT - 5

AIM :- To show that light is necessary for photosynthesis

REQUIREMENTS :- A destarched potted plant, two pieces of black papers, two clips and materials for starch test.

PROCEDURE :- Select a healthy leaf of a destarched potted plant. Cover a part of this leaf with a black paper strip on each side of the leaf, fix in position by paper clips. Expose this plant to sunlight for a few hours. Then, detach this leaf. Remove the black paper and test for the presence of starch with iodine solution.

OBSERVATIONS :- The part of leaf covered with black paper gives negative test for starch because it has not received light for photosynthesis. whereas the uncovered part gives positive test for starch.

INFERENCE :- Only the leaf parts exposed to sunlight showed the presence of starch, i.e., only these parts performed photosynthesis. It proves that light is necessary for photosynthesis.

PRECAUTIONS :-

(i) Plant used in the experiment should be destarched.
(ii) Fix the black paper firmly on the selected leaf, on both sides.

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(iii) Kill the leaf in boiling water before removing chlorophyll.

(iv) Wash the decolourised leaf for softening before iodine test.

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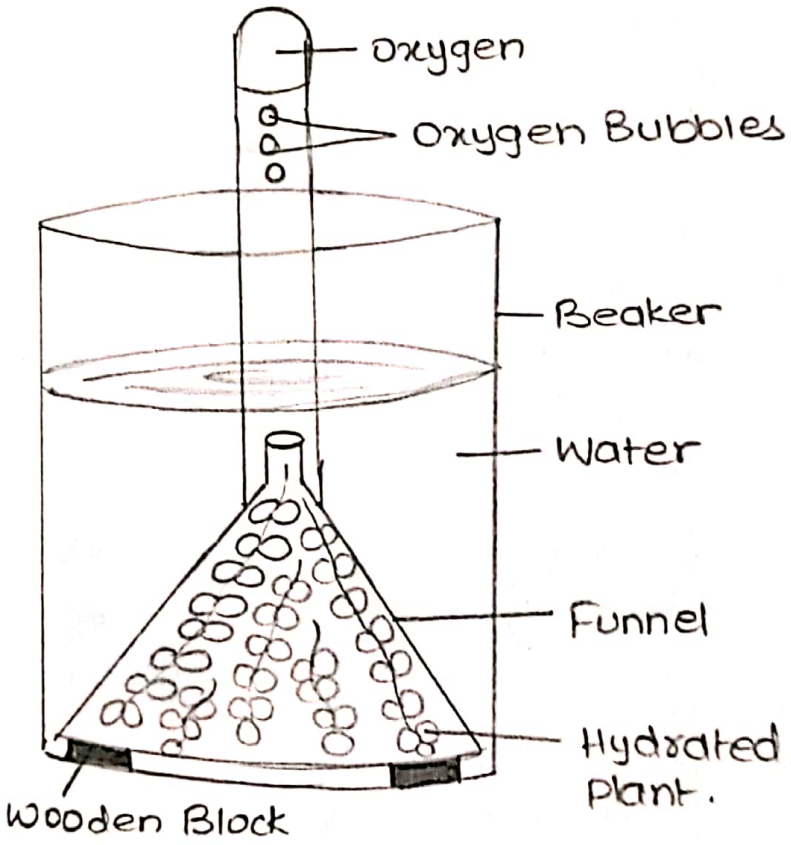
EXPERIMENT-6

AIM:- To show that oxygen is evolved during photosynthesis.



EXPERIMENT TO PROVE THAT OXYGEN IS EVOLVED DURING PHOTOSYNTHESIS

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EXPERIMENT - 6

AIM :- To show that oxygen is evolved during photosynthesis

REQUIREMENTS :- Aquatic plant (Hydrilla, Elodea etc.) large beaker, funnel with short stem, sodium bicarbonate and test tube.

PROCEDURE :- Place hydrilla plants at the bottom of a large beaker with the cut end of the stems pointing towards the upper side. Cover the plants by inverting over them, a short stemmed funnel. Pour water into the beaker till it has covered the stem of the funnel completely. Dissolve a bit of sodium bicarbonate in it to increase CO_2 concentration.

Invest a test tube full of water over the funnel and place the apparatus in bright sunlight.

OBSERVATIONS :- Soon gas bubbles will be seen arising out of the plant. The gas bubbles rise upwards and collect in the test tube. As a result water level lowers down in the test tube. When sufficient gas has been collected, remove the test tube and introduce a glowing splinter which will burn brightly showing that the gas evolved is oxygen.

INFERENCE :- The gas evolved and collected in test tube is oxygen and is more as compared to atmospheric

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air. Hence, oxygen is evolved in photosynthesis.

PRECAUTIONS :-

(i) Stem of the funnel should be completely dip in water.
(ii) Cut end of the shoots should be towards the stem of the funnel.
(iii) The appratus should not be much disturbed after setting.
(iv) The experiment can be performed only in sunlight.
(v) Add a pinch of sodium bicarbonate into the water to increase CO_2 concentration.

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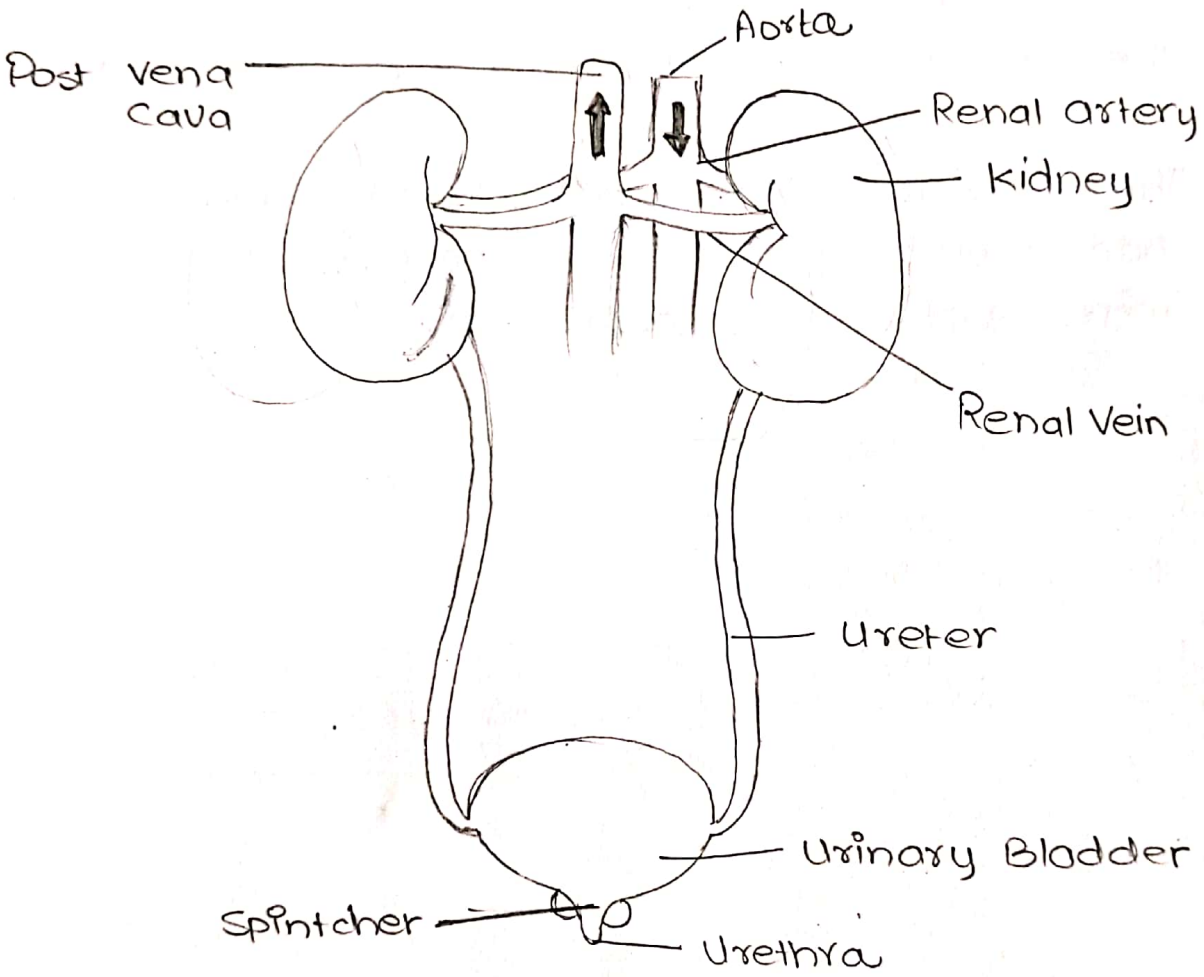
EXPERIMENT-7.

Aim: To identify the structure of urinary system through models and charts.



THE URINARY SYSTEM

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EXPERIMENT-7

AIM :- To identify the structure of urinary system through models and charts.

REQUIREMENTS :- Specimen of goat's kidney or chart of urinary system.

PROCEDURE :- Study the parts of the urinary system as described below and draw diagram.

(A) External features of Urinary System :

The urinary system of man consists of (1) a pair of kidneys (2) A pair of ureters (3) A urinary bladder (4) Urethera.

(i) The kidneys are darkred, slightly flattened, bean-shaped organs.

(ii) They are about 10cm long, 5cm wide and 4 cm thick.

(iii) The outer surface of the kidney is convex while the inner surface is concave which is known as hilum.

(iv) Ureter and renal vein come out from the notch (hilum) in the median surface of each kidney and renal artery enters in through hilum.

(v) The upper end of each ureter expands to form the funnel shaped basin called renal pelvis. It divides into 2-3 branches called calcyes.

(vi) The pair of ureters enter the urinary bladder in the lower part of abdomen. The urinary bladder serves as a reservoir of urine.

(vii) The opening of the bladder into urethra is gaurded

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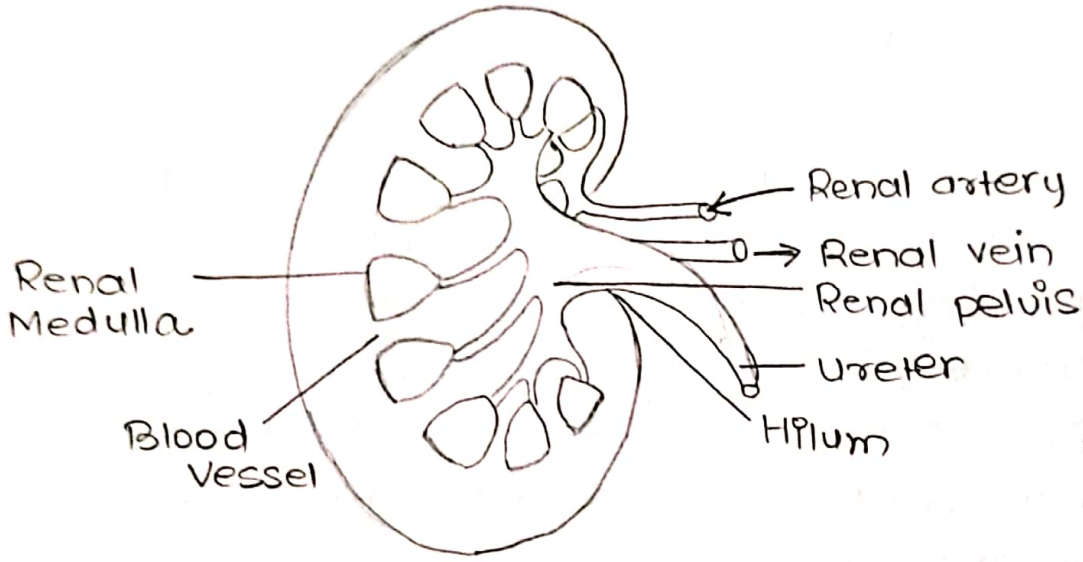
Experiment -7

Aim: To identify the structure of urinary system through models and charts.



INTERNAL STRUCTURE OF HUMAN KIDNEY.

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by spincher muscle which closed except when the urine is to be passed out.

(viii) Urethra is small tube leading from the floor of the bladder to the exterior.

(B) Internal features of kidney :-

(i) It has two main regions — outer dark part called the cortex and inner lighter part called medulla.

(ii) The medulla is filled with cone shaped projections called pyramids, representing groups of collecting tubes.

(iii) The apex of each pyramid points into a sac like cavity called pelvis of the kidney.

(iv) The pelvis leads into a long narrow tube the ureter.

(v) The cortex made up of anormus number of malpighian body or renal corpuscle of the uriniferous tubules (nephrons). and its proximal parts while the distal parts are presents in the medulla.

(vi) Nephrons are the structural as well as functional units of the kidney

(vii) Renal corpuscle possesses a large network of blood capillaries which form glomerulus.

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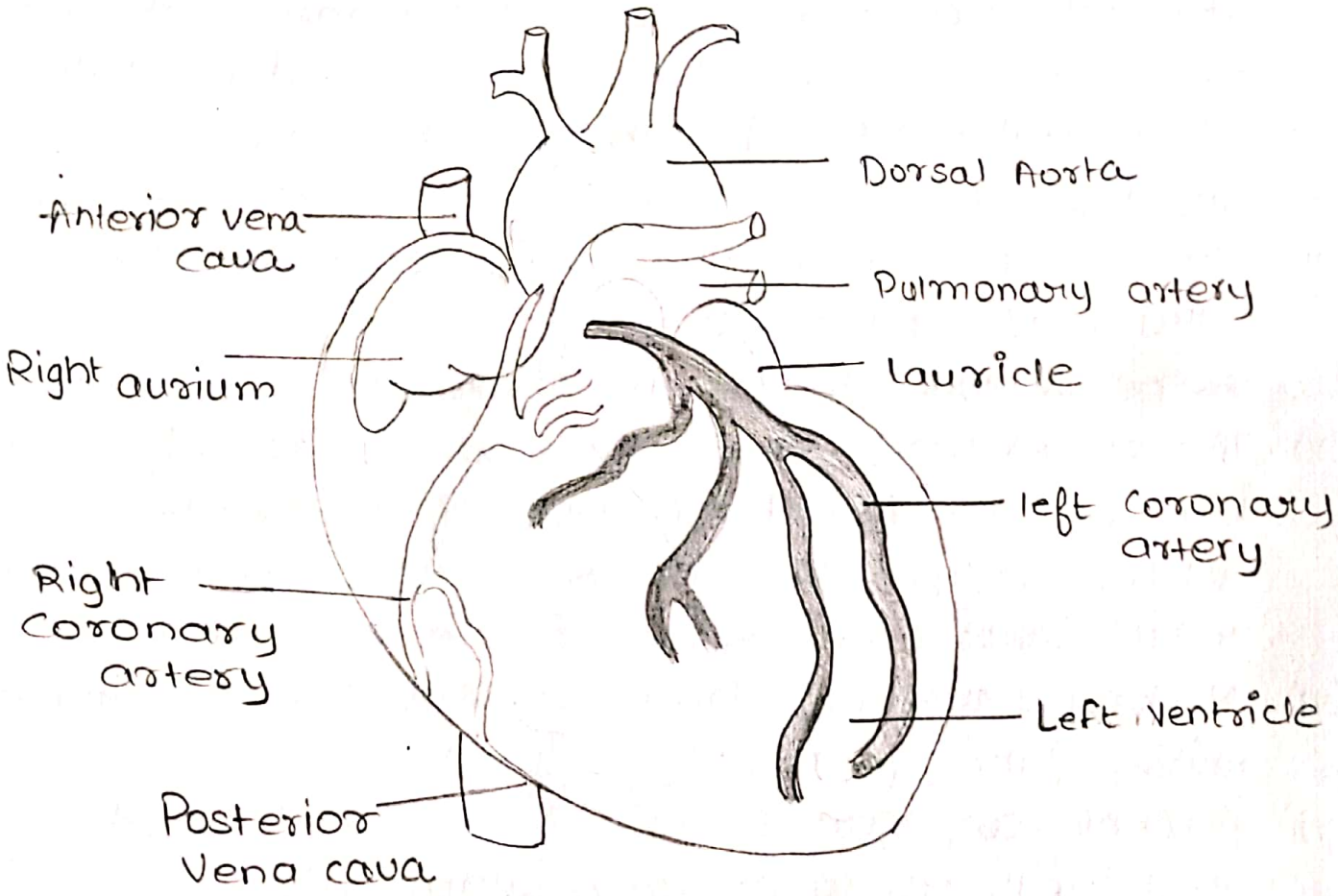
Experiment – 8.

Aim: To identify the internal structure of a human heart through models and charts.



INTERNAL STRUCTURE OF HEART

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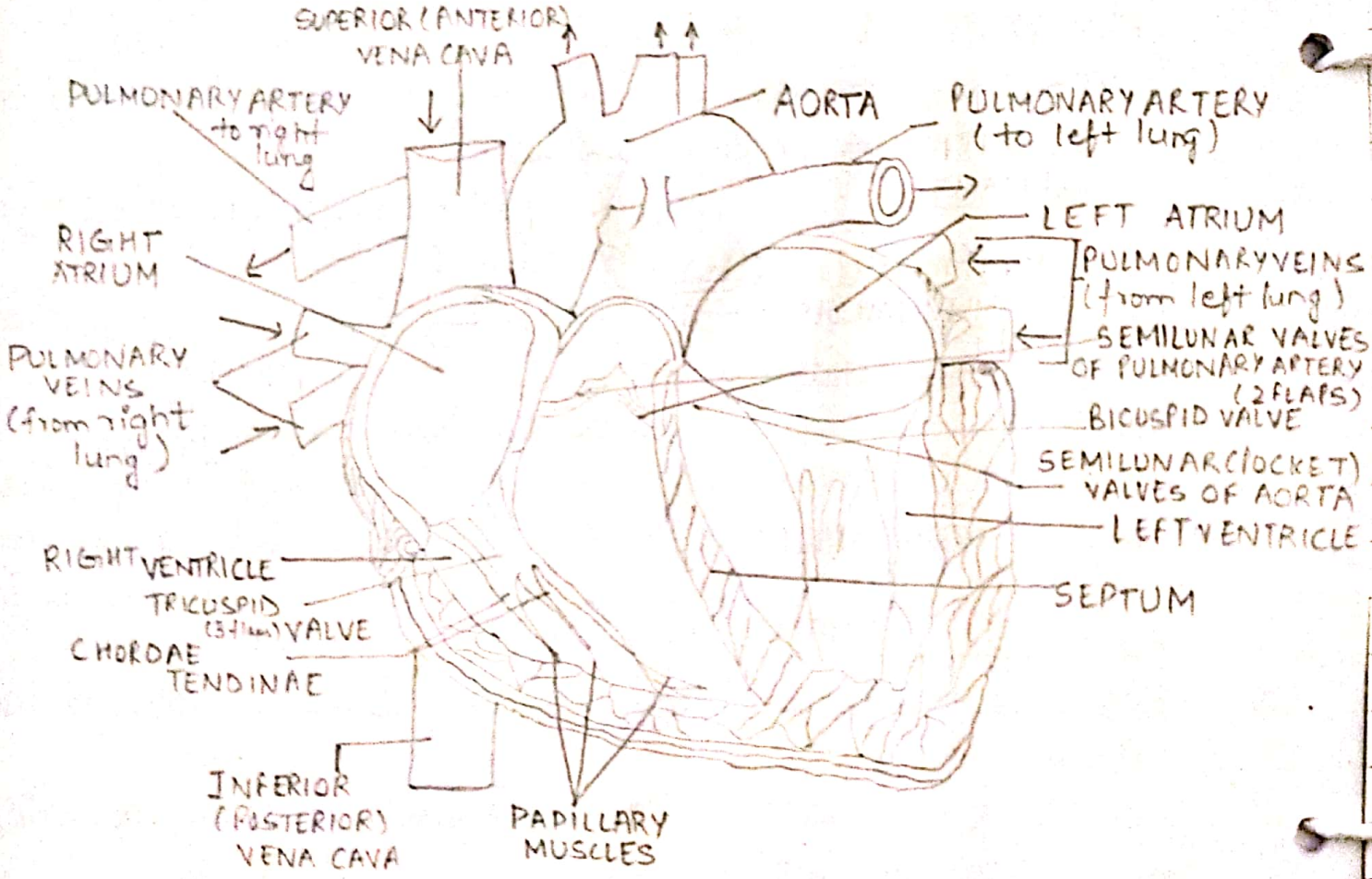
EXPERIMENT-8

AIM- To identify the internal structure of a human heart through models and charts.



INTERNAL STRUCTURE OF KIDNEY

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EXPERIMENT – 8

AIM :- To identify the internal structure of a human heart through models and charts.

REQUIREMENTS :- Specimen of goat's heart or model of heart.

PROCEDURE :- Study the internal parts of the heart as described below and draw diagrams. Label its various parts.

(i) Human heart is located between the two lungs in the thoracic cavity.

(ii) The heart is hollow, fibromuscular organ of a somewhat conical or pyramidal form with upper broad part, the base and lower narrow, the apex. The apex is slightly directed to the left.

(iii) Heart is protected by pericardium. It is a two layered sac consisting of outer perietal pericardium and inner vesceral pericardium. The pericardium encloses pericardial fluid which protects the heart from shocks and mechanical injuries and also allows free movement of the heart.

(iv) It is a four chambered structure. The upper part consists of two thin walled atria divided by an interatrial septum and the lower two thick muscular walled ventricles.

(v) Auricles are demarcated externally from the ventricles by an irregular groove called coronary sulcus.

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(vi) The two ventricles are demarcated externally from each other by an oblique groove termed as interventricular sulcus.

(vii) The right ventricle has thinner muscular walls than the left ventricle.

(viii) The right auricle receives three large blood vessels :-

(a) The superior vena cava brings deoxygenated blood into the right auricle from anterior region.

(b) The postier vena cava brings blood from the posterior or lower region of the body.

(c) Coronary sinus returns blood from the walls of heart.

(ix) The left auricle receives four pulmonary openings of four pulmonary veins which bring oxygenated blood from the right and left lungs.

(x) From the right ventricle arises the pulmonary artery which carries the deoxygenated blood to the lungs.

(xi) From the left ventricle arises the dorsal aorta which carries the oxygenated blood to all parts of the body.

(xii) A pair of coronary arteries arise from the base of the aorta and supply blood to the heart by many of its capillaries.

(xiii) A right auriculo – ventricular valve made up of three thin triangular leaf like flaps (cusps) is present in the auricle ventricular aperture and is called a tricuspid valve.

(xiv) The apices of the valves are held in position by tendinous cords – chordae tendinate arising on the muscular projections of the ventricles.

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(xv) The left auriculo – ventricular aperture has a biscuspid valve.

(xvi) The pulmonary aorta and the dorsal aorta too have three pocket shaped, semilunar valves, respectively called pulmonary semilunar valves and aortic semilunar valves.

(xvii) The right auricles has the seno auricular node or the pacemaker (SAN) made up of specialized muscle cells help in origin of heart beat.

(xviii) The heart receives deoxygenated blood in the right auricle then pumps it through right ventricle to the lungs for oxygenation through the pulmonary artery.

(xix) The oxygenated blood is brought back into the left auricle through the pulmonary veins, and then from there it is pumped into left ventricle from where it is pumped to all parts of the body by the dorsal aorta and its branches.

PRECAUTIONS :-

Carefully note down the parts of heart exeternally and internally from the model/chart.

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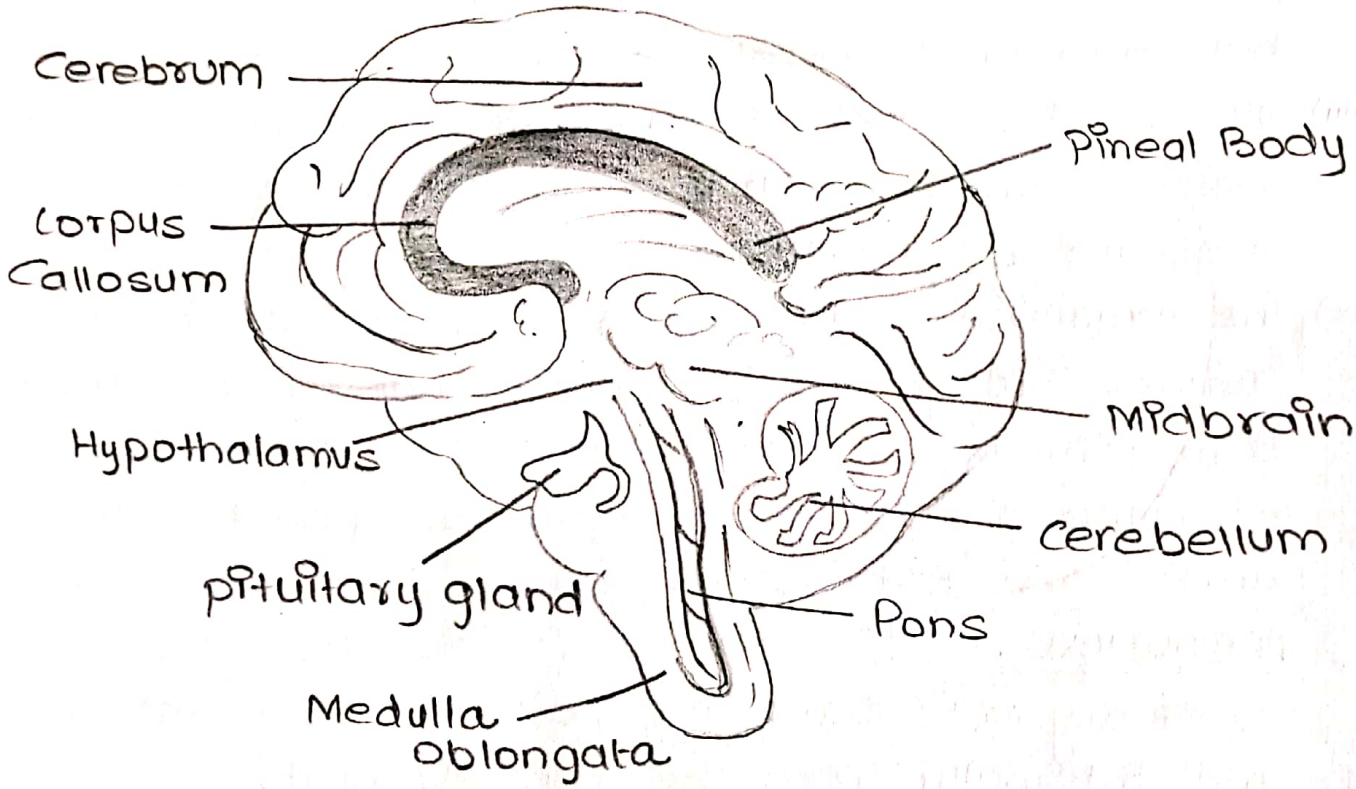
Experiment –9.

Aim: To identify the parts of brain through models.



MEDIAN SECTION OF BRAIN

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EXPERIMENT- 9

AIM :- To identify the parts of brain through models

REQUIREMENTS :- Specimen of goat's brain or chart or model of brain.

PROCEDURE :- Study the parts of the brain as described below and draw diagrams. Label its various parts. The brain of human adult weighs about 1450 g. It consists of the following three parts:

(a) **Forebrain or Cerebrum :**

It forms the largest part of the brain and is divided by a deep cleft in the middle into two distinct lobes called the right and left cereberal hemispheres.

These two hemisphere are connected to each other by a mass of nerve fibres called corpus callosum. The outer part of the cerebrum consists of nerve cells and is slightly darker in colour and is called grey matter. The inner part is lighter i.e., white matter is composed of nerve fibres. The outer surface of cerebrum shows upward folds or gyri, alternating with downward grooves of sulci. Cerebrum is associated with three types of activities

- Mental activities involving memory, intelligence, thinking, resoning, learning and moral sense.
- Sensory perception as of pain, temperature, touch and senses of smell, hearing and taste.
- The initiation and control of the movements of the

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voluntary muscles.

The hypothalamus controls hunger, thirst, body temperature, heart and blood vessels and reactions such as pleasure, fear or rage. The pituitary gland is directly attached to the hypothalamus by a stalk.

(b) Midbrain :-

It is the area of brain connecting cerebrum to parts of the hindbrain.

(c) Hindbrain :-

It is the posterior, small part of brain, differentiated into three parts : (i) Cerebellum also consists of two hemispheres. It is concerned with posture and postural activities. It plays an important role in muscular coordination and the maintainence of balance.
(ii) Pons varolli links the cerebellum and medulla oblongata with cerebrum through the midbrain.
(iii) Medulla oblongata forms the lowermost part of brain and continues outside the skull as spinal cord. It controls involuntary activities of the body such as breathing, heart beat, blood pressure, swallowing etc..

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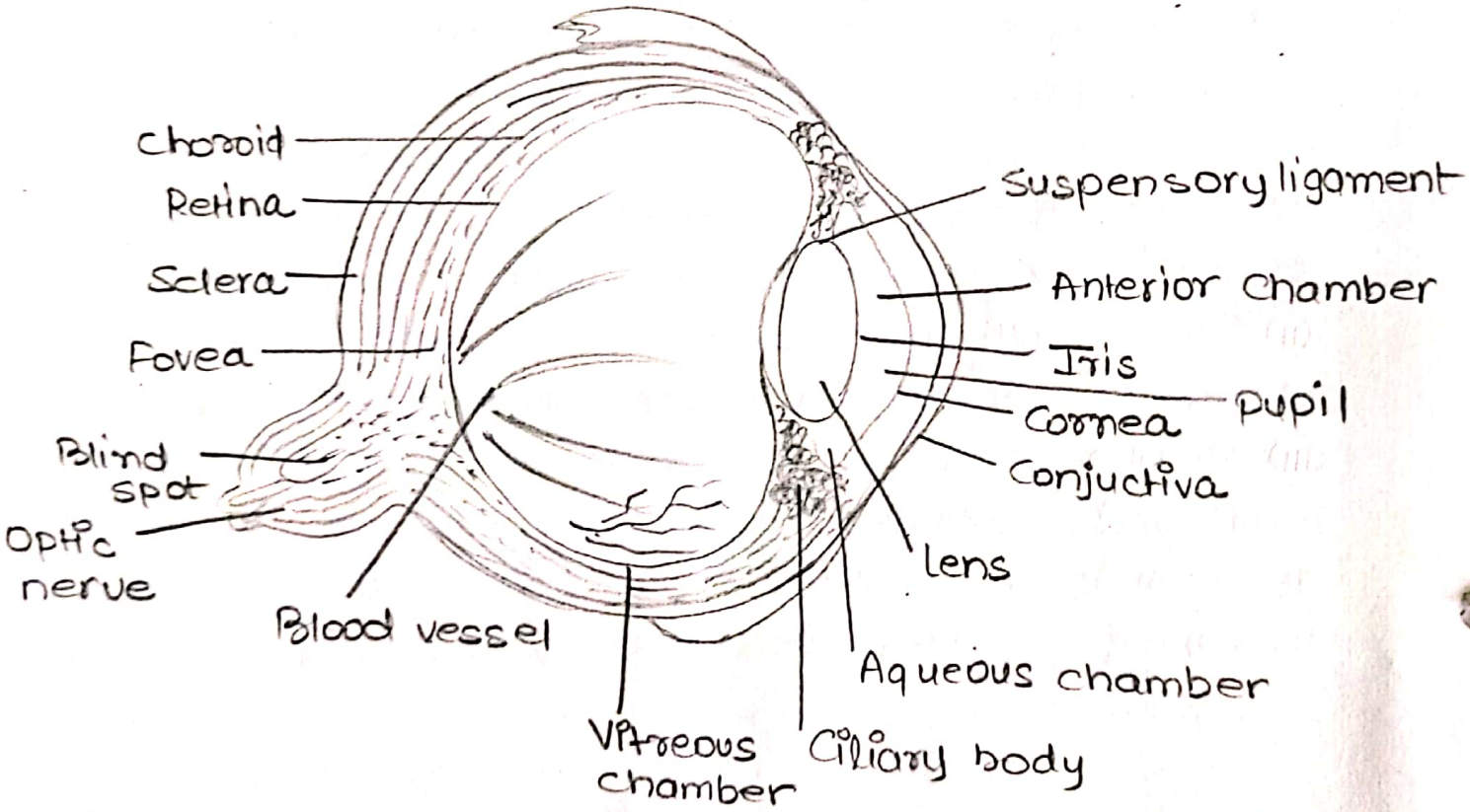
Experiment - 10

Aim: To study structure of the eye



L.S. OF THE EYE

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Experiment -10.

AIM :- To study the structure of the eye.

REQUIREMENTS :- Specimen of goat's eye or model or chart of eye.

PROCEDURE :- Observe the external view of the eyes and draw a diagram. Label its various parts. The eye is a hollow spherical structure measuring about 2.5 cm in diameter, called eyeball. Externally the eyes are covered by the following :

(a) The eyebrows prevent any sweat containing dust particles from entering the eyes.

(b) The eyelids :

- Upper eyelid is movable and protects and cleans the surface of the eye.
- Lower eyelid is immovable and is also protective in nature. Conjuctiva is the outermost transparent continuation of the skin of eyelids.

(c) Eyelashes :

It prevent dust particles from entering the eyes when both eyelids are closed. Observe the model of the eye and note the various parts. Then, draw a vertical section of the eye. The following parts are seen in a eyeball :

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- The outer fibrous coat : consists of sclera and cornea.

(a) Sclera → White opaque part which covers and maintains the shape of the eyeball, serves for the attachment of the eye muscles.

(b) Cornea → It allows light to enter the eye only from a curved transparent part. It helps to focus light waves as they enter eye. It is without blood supply.

- The middle vascular coat : It consists of following parts: Choroid layer is the second layer of the eye which is dark black, pigmented to absorb extra light. It also has capillaries for blood supply to the eye. Behind the cornea, choroid is modified as :

(a) Iris → It is a circular muscular diaphragm containing the pigment giving eye its colour. It encloses the aqueous humour in the anterior. It has an opening in the centre called the pupil. It regulates the size of the pupil. Pupil controls the amount of the light entering the eye.

(b) Ciliar body consists of radial and circular muscles which change the tension on the suspensory ligaments in order to change the ... focal length of the lens.

(c) lens is biconvex, transparent, elastic structure attached to suspensory ligaments and focuses light on to the light sensitive retina layer. It can change shape from moment to moment.

- The Inner nervous coat : It consists of the following.

(a) Retina is the innermost light sensitive layer. It consists of light sensitive cells of two types — roots.

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and cones. Rods are responsible for seeing in dim light and cones for seeing coloured objects in bright light.

(b) Yellow spot / fovea centralis consists of cone cells only. The image is sharpest here. It is the place of most distinct vision. It has its middle a depression which has cone cells only.

(c) Blind spot is an exit point on optic nerve where no image is formed as it has no light sensitive cells.

(d) Optic nerve is a bundle of nerve fibres from all over retina cells to take the message to the visual centre of the brain to analyse size, distance and colour of the object.

(e) Vitreous humour is a jelly like fluid behind the lens. This maintains the shape of the eye and keeps the retina in position.

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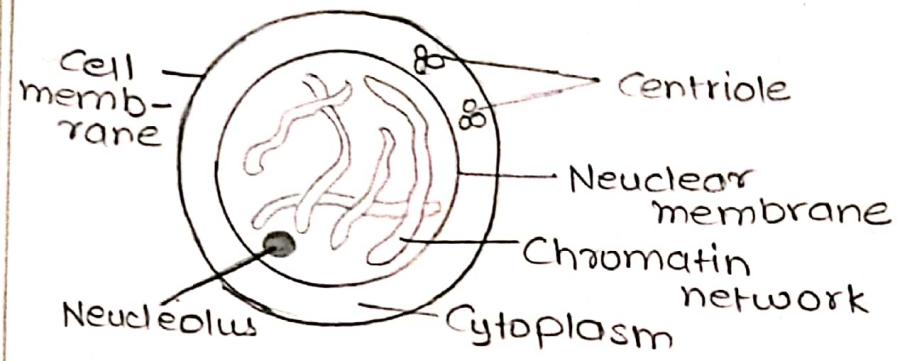
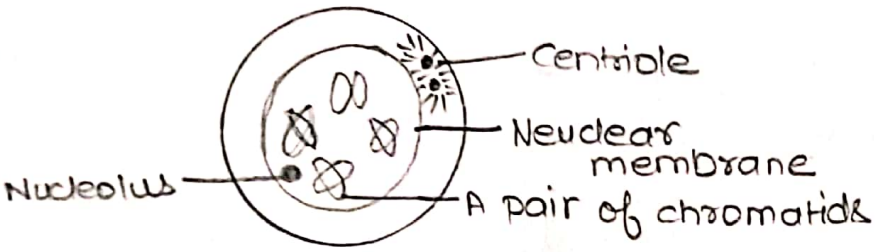
Experiment - II

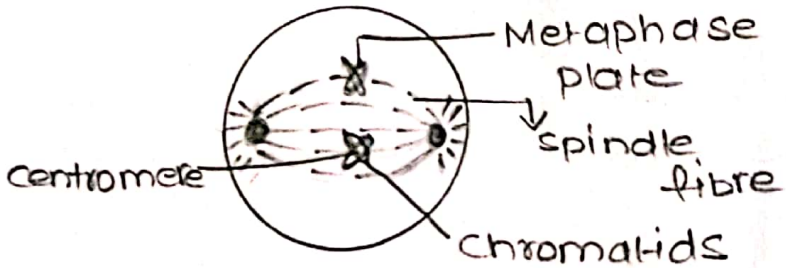
Aim : To identify and draw labelled diagram of different stages of mitosis from prepared slides.



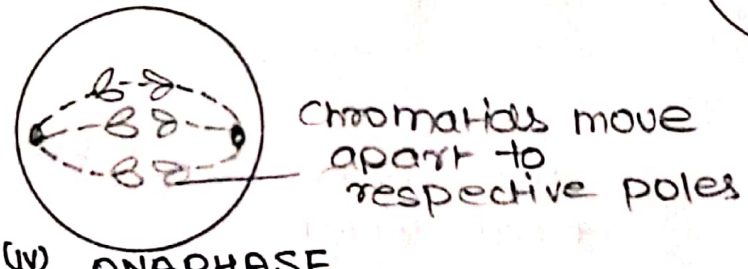
(I) INTERPHASE



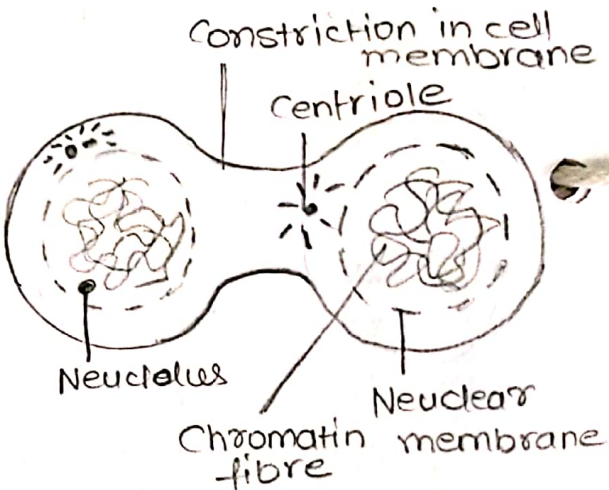
(II) PROPHASE



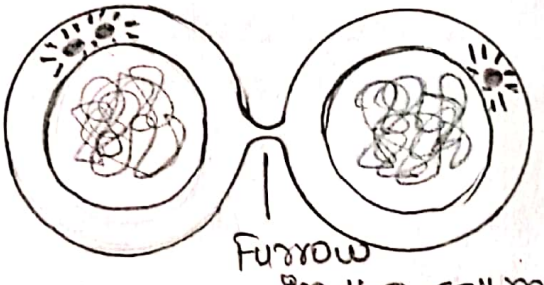
(III) METAPHASE



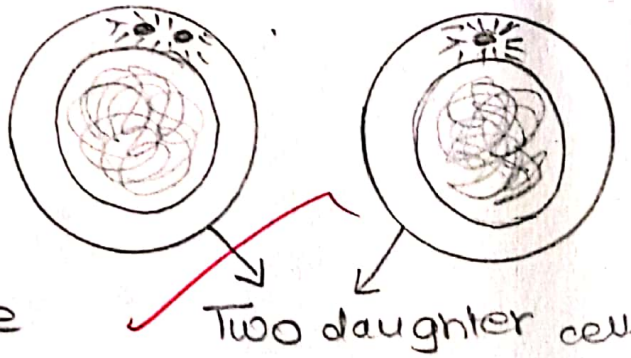
(IV) ANAPHASE



(V) TELOPHASE



(VI) CYTOKINESIS



DIFFERENT STAGES OF MITOSIS IN ANIMAL CELL.

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Experiment – II

AIM : To identify and draw labelled diagrams of different stages of mitosis from prepared slides

REQUIREMENTS : Compound microscope, notebook, pencil, permanent slide of mitosis.

THEORY : Cell division is the process of formation of daughter cells from a single cell. It is of two types :-

- Mitosis or Equational division
- Meiosis or Reductional division

Mitosis :- It is a process by which chromosomes are duplicated and distributed equally to the two daughter cells. It maintains the chromosome number constant during growth and repair. Mitotic cycle mainly involves two processes.

(i) Karyokinesis i.e., division of nucleus into two daughter cells.
(ii) Cytokinesis i.e., division of cytoplasm to form two daughter cells.

Mitosis takes place in somatic cells or vegetative cells. It helps in growth of the body and healing of wound.

Study of Mitosis in animal cell →

(a) Interphase stage :- (Points of identification).

- It is a non-dividing stage.
- Cells contain large and distinct nucleus.
- Nuclear membrane is present around the nucleus.

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Chromosomes are not distinct. They are lying in the form of long chromatin network.
Nucleolus is also distinct.
Formation of two centrosomes or centriole pair.

(b) Prophase Stage : (Points of identification).

- The chromatin network starts condensing and coiling to appear as thread like chromosomes.
- The nucleolus gradually dissapears by end of prophase.
- Nuclear membrane starts disappearing.
- Each chromosome possesses two chromatids which are joined at a point called centrosome.
- Separation and movement of centrosomes to opposite pole, formation of astral rays to form asters.

(c) Metaphase Stage :

- Nuclear membrane completely dissappears.
- The chromosomes become fully condensed with chromatids becoming shorter and thicker due to their condensation.
- Chromosomes acquire their specific shape and size.
- Spindle formation takes place from two asters.
- Chromosomes align themselves in the centre of the spindle called as equator.
- The centrosome of each chromosome lies on the equatorial plate and is attached to the chromosomal fibre from each pole.

(d) Anaphase Stage :-

- The centrosome of each chromosome is divided into two. Now, each chromatid comes to possess its own centrosome.

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- Chromosomal fibres gradually shorten. The chromatids of a chromosome seperate and move to their respective poles.
- At poles each chromatid behaves as a complete and independent chromosome.
- The centrosomes of the chromosomes are directed towards the poles whereas the arms are directed towards the equatorial plate.
- By the end of anaphase, chromosomes have reached their respective poles.

(e) Telophase stage :

- The chromatids at each pole again uncoil, become long and thin.
- They again form the neuclear membrane.
- They again form the chromatin network and neucleolus reappears.
- Spindle apparatus starts disappearing.
- In animal cells constriction or furrowing in the middle of cytoplasm divides the cell into two daughter cells.
- Each daughter cell formed contains same number of the chromosomes as the parental cell.

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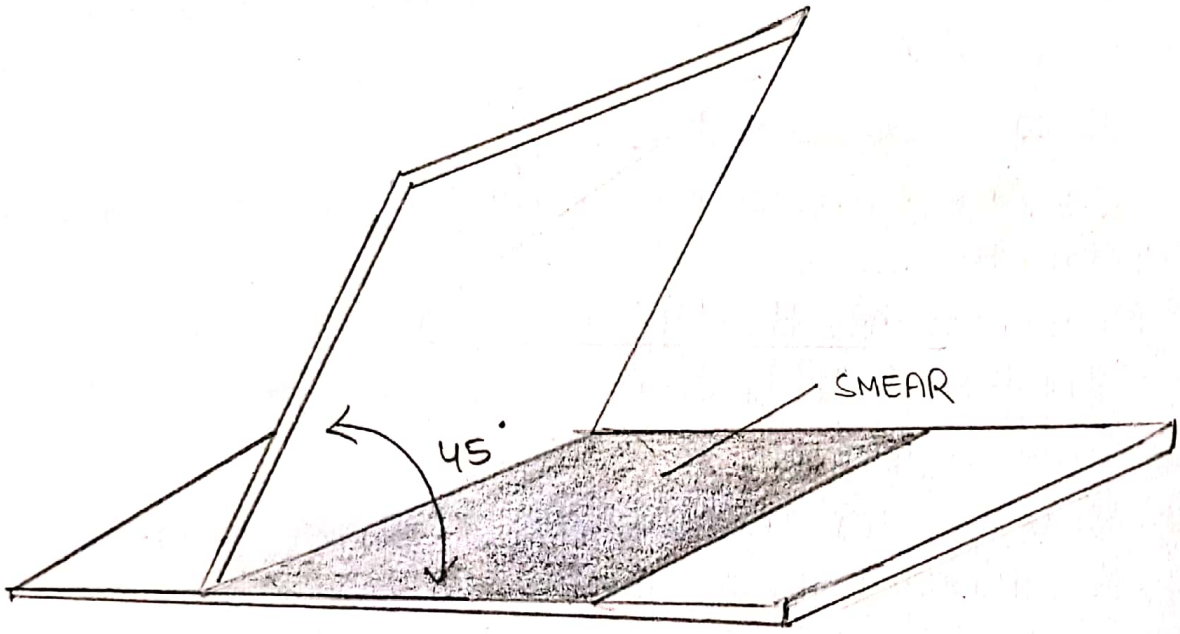
EXPERIMENT - 12

AIM: To identify types of human blood cells.



SPREADING OF BLOOD ON A SLIDE.

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EXPERIMENT-12

AIM: To identify different types of human blood cells.

REQUIREMENTS: A permanent slide of human blood, a compound microscope, slides, coverslips, cotton, spirit lamp, a disposable needle, 90% alcohol and Leishman's stain.

PROCEDURE:-

Smear Method :

Clean your figer with cotton, soaked in alcohol.
Sterlise the needle in alcohol over a spirit lamp.
Prick the tip of your finger with the needle and press the finger. Blood starts oozing out.
Put a drop of blood on one end of the slide.
Place another slide with one end at 45 angle on the first slide.
Bring the upper slide near the drop of blood and touch it.
This would spread the blood along the end of the slide forming a uniform layer.
Now push the upper side rapidly towards the opposite end all along touching the, first slide to form a uniform blood smear and let the smeared slide dry in air.
Put a few drops of Leishman's stain on the blood film.
After 2-3 minutes drain out the stain and dip the slide in a beaker of water to wash the excess stain.
Dry the slide and observe it under the high power microscope especially with oil immersion at 100x

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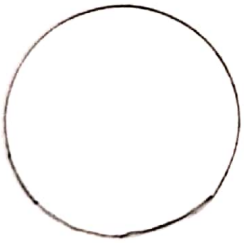
EXPERIMENT-12

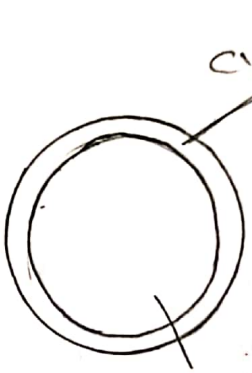
AIM: To identify different types of human blood cells.

SIDE VEIN

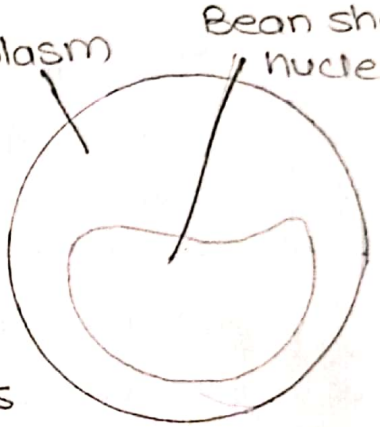


SURFACE VEIN

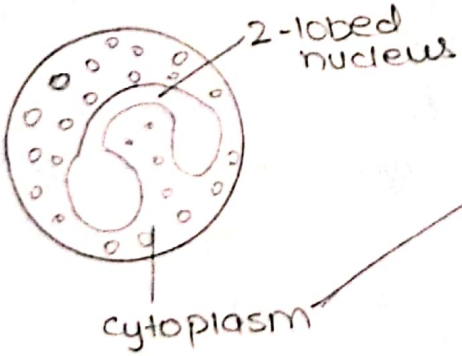
ERYTHROCYTE (RBCs)



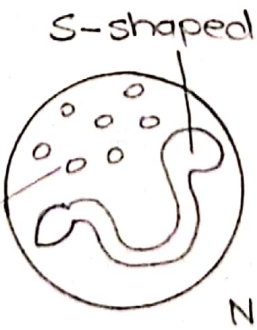
LYMPHOCYTE



MONOCYTE



EOSINOPHIL



BASOPHIL

NETROPHIL

PLATELETS

DIFFERENT TYPES OF BLOOD CELLS.

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Identify and count the different types of blood cells per thousand of total blood cells with the help of occulomicrometer (graded eyepiece).

OBSERVATIONS :- Blood is mobile connective tissue, made up of a fluid part called plasma and a cellular part, blood cells / corpuscles. Blood cells are of three types :

(a) Red Blood Cells (erythrocytes).

Human RBCs are 7-8 μ in diameter.

They are mostly biconcave disc like structures flattened at the centre.

1 mm^3 of blood contains 5 to 6 million RBCs in males and 4-5 million in females.

(b) White Blood Cells (leucocytes)

They do not have haemoglobin.

They contain a prominent nucleus.

They are of two types :

(a) Granuloaytes : Cytoplasm contains granules and the nucleus is constricted into lobes.

(i) Neutrophils → Nucleus is 3-5 lobed. The fine cytoplasmic granules stain with neutral dyes.

(ii) Eosinophils → Nucleus is 2 lobed. Coarse granules stain with acidic dyes.

(iii) Basophils → Nucleus is S-shaped, 3 lobed. large carse cytoplasmic granules stain with basic dyes.

(b) Agranulocytes : The cytoplasm lacks granules.

(i) Lymphocytes → Large spherical nucleus and very little cytoplasm.

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(ii) Monocytes: Large bean shaped nucleus and enough cytoplasm

(c) Blood Platelets (thrombocytes).

(i) They are minute, colourless cell fragments.

(ii) Distinct nucleus is absent.

(iii) They help in blood clotting.

Nell

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