LIBERTY PAPER SET

STD. 10 : Science [N-011(E)]

Full Solution

Time : 3 Hours **ASSIGNTMENT PAPER 1**

Section-A

1. (A) Phenolpthalein **2.** (C) C_4H_9OH **3.** (C) Excretion **4.** (C) It has low resistivity and high melting point. **5.** (A) away from F_2 **6.** (C) 25 cm **7.** Methane **8.** 46 **9.** Arteries **10.** Bryophyllum **11.** Concave lens **12.** mercury **13.** True **14.** False **15.** False **16.** True **17.** Cerebellum **18.** Dominant : TT, Tt Recessive : tt **19.** Phenomena of spliting of white light in to seven basic colour is known as diffraction / dispersion of light. **20.** (C) Insulator-Nickel **21.** (c) Regulate metabolism of body. **22.** (a) Development of Male Reproductive Organs **23.** (b) Primary consumer **24.** (a) Secondary consumer 44. u=–30 cm, m=+0.33

Section-B

25. In the presence of oxygen in the air, the fats present in the fatty food are getting oxidized to certain compounds which have a bad odour, that is, the food becomes rancid.

- Flushing with nitrogen cuts off the contact of food with oxygen and protects the food from rancidity.

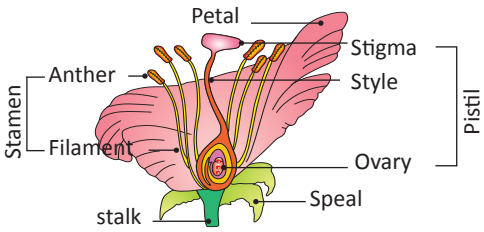
26. **Properties of ionic compounds :**

- Ionic compounds are solid. Ionic bond has greater force of attraction because of which ions attract each other strongly. This makes ionic compounds solid.
- Ionic compounds are brittle.
- Ionic compounds have high melting and boiling points because force of attraction between ions of ionic compounds is very strong.
- Ionic compounds generally dissolve in water.
- Ionic compounds are generally insoluble in organic solvents; like kerosene, petrol, etc.
- Ionic compounds do not conduct electricity in solid state.
- Solution of ionic compounds in water conducts electricity and this is due to presence of ions in the solution of ionic compound.
- Ionic compounds conduct electricity in molten state.

27.

	Arteries	Veins
(1)	Moves away from the heart	Move towards the heart
(2)	Distributes blood to the body organs	Collect blood from body organs.
(3)	Valves are absent	Valves are present
(4)	Blood pressure is high in arteries	Blood pressure is low in veins
(5)	Carry oxygenated blood except pulmonary artery.	Carry de-oxygenated blood except - pulmonary vein
(6)	They it have thick and elastic wall	They have thin wall
(7)	Red in colour due to oxygenated blood	Blue in colour due to de-oxygenated blood

28.



29. (a) Bacterial : Gonorrhoey, Syphilis
Viral : Warts & AIOS

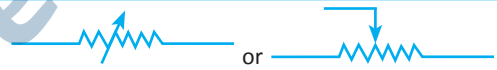
Methods of Contraception

- **Mechanical barries :**
- In this method, sperm does not reach the egg.
- Condoms on the penis or similar coverings worn in the vagina can serve this purpose.
- The devices such as the loop as the copper-T are placed in the uterus to prevent pregnancy.

30. The power of accommodation of the eye is the maximum variation of its power for focusing on near and far (distant) objects.

(ii) Ciliary Muscles : It modify the shape of the eye-lens which leads to the variation in focal-lengths.

31.

Sr. No.	Components	Symbols
1.	A battery or a combination of cells	
2.	Plug key or switch (closed)	
3.	Wires crossing without joining	
4.	Variable resistance of rheostat	

32. Potential difference, V = 12V, Charge = 2C

- V = W/Q
- 12 = W/Q
- W = 24J
- Hence, the work done in moving a charge of 2C across the two points having a potential difference is 12V is 24J.

33. **Properties of magnetic lines of force :**

- Field lines arise from North Pole and end into South Pole of the magnet.
- Field lines form circular loop.
- Field lines are closer in stronger magnetic field.
- Field lines never intersect each other as for two lines to intersect; there must be two North directions at a point, which is not possible.
- As we go far from magnets, intensity of magnetic field lines gets decreased.

34.

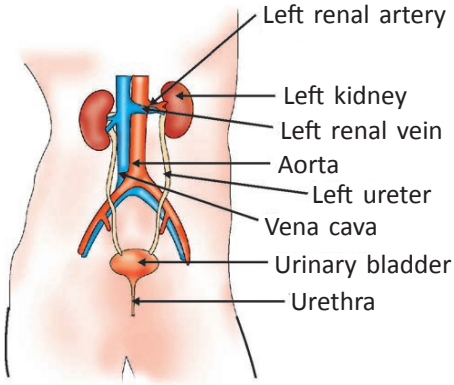
Biotic	Abiotic
(1) Living factors that affect environment or organization.	(1) Non Living factors that affect env. or Organization.
(2) Ex. food, Predation, Disease, Competition	(2) Ex. Temperature water Causes, Soil Ph.

35. With the use of several pesticides and other chemicals to protect our crops from diseases and pests, these chemicals are either washed down into the soil or into the water bodies.

- From the soil, these are absorbed by the plants along with water and minerals, and from the water bodies these are taken up by aquatic plants and animals.
- This is one of the ways in which they enter the food chain.

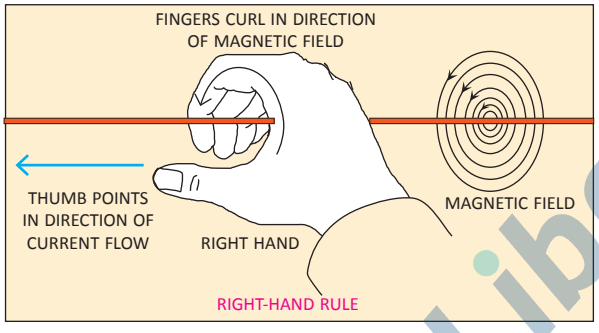
- As these chemicals are not degradable, they get accumulated progressively at each trophic level. The maximum concentration of these chemicals gets accumulated in human bodies. This phenomenon in known as biological magnification.
- As human beings occupy the top-level in any food-chain, the maximum concentration of these chemicals get accumulated in our body.

36.

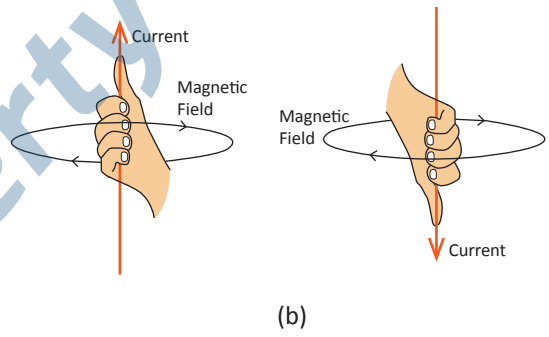


Excretory system in human beings

37. Imagine you are holding a current carrying straight conductor in your right hand such that the thumb is pointing towards the direction of the currents. Then the fingers wrapped around the conductor give the direction of magnetic field.



(a)



(b)

Section-C

38.
- Take about 2g silver chloride in a China dish & put in sunlight.
- What is its colour ?
- Place this China dish in sunlight for some time.
- Observe the colour of the silver chloride after some time.

Observation
- The white silver chloride turns grey in sunlight.
- This is due to decomposition of silver chloride into silver by light.

$$2AgCl(s) \xrightarrow{sunlight} 2Ag(s) + Cl_2(g)$$

39. Reaction is Decomposition

	Metal Elements	Non-metal Elements
(i)	Metals are usually found in solid state.	Non-metals usually found in gaseous or solid state.
(ii)	Metals are usually hard.	Non-metals are usually brittle.
(iii)	Metals in pure state have a shing surface.	Non-metals do not have a shing surface.
(iv)	Metals are good conductors of heat.	Non-metals are usually bad conductors of heat.
(v)	Metals show ductility and malleability.	Non-metals do not have ductility and malleability nature.
(vi)	Metal produce ringing sound when we strike it.	Non-metals do not produce such sound when we strike it.

(vii)	Metals have high tensile strength due to high attraction between molecules.	Non-metals have low tensile strength due to low attraction between molecules.
(viii)	Metals have high density.	Non- Metals have low density.

40. (i) Extraction of zinc metal.

- Zinc metal is found in the form of Zinc blend (ZnS) and in the form of calamine $[Zn(CO)_3]$

(ii) Roasting of Zinc Blend.

- Zinc blend first converted into zinc oxide by process of Roasting.
- ZnS is first heated strongly in the presence of excess of air.

$$\underset{\text{Zinc Sulphate}}{2ZnS} + \underset{\text{Oxygen}}{3O_2(g)} \xrightarrow{\text{Heat}} \underset{\text{Zinc oxide}}{2ZnO(s)} + \underset{\text{Sulphur dioxide}}{2SO_2(g)}$$

(iii) Calcination of calamine ore :

- Calamine [Zn(CO)3] is heated in limited air.

  Calamine [Zn(CO3)] is converted in zinc oxide.

  This known as calcination.

$$\underset{\text{Zinc carbonate}}{Zn(CO_3)(s)} \rightarrow \underset{\text{Zinc oxide}}{ZnO(s)} + \underset{\text{carbon dioxide}}{CO_2(g)}$$

(iv) Reduction of Zinc-oxide to obtain zinc metal.

- In this process, zinc oxide is heated with a reducing agent, such as carbon to convert zinc oxide into zinc metal.

$$\underset{\text{Zinc oxide}}{ZnO(s)} + \underset{\text{carbon}}{C(s)} \xrightarrow{\text{Heat}} \underset{\text{Zinc}}{Zn(s)} + \underset{\text{Carbon monoxide}}{CO(g)}$$

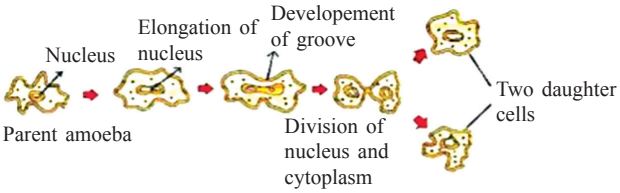
- Apart from carbon many other reducing agents are used to obtain metals from respective oxides.

41. **Reflex Arc**

- The neural pathway that controls the reflexes occurs through the reflex arc. It acts on an impulse even before it reaches the brain. There are some stimuli that require an automatic, instantaneous response without the need of conscious thought. The following diagram shows the reflex arc pathway.
- The receptor here is the sense organ that senses danger. The sensory neurons pick up signals from the sensory organ and send them through other neurons which are interconnected. It is then received by the relay neuron which is present in the spinal cord. Immediately, the spinal cord sends back signals to the muscle through the motor neuron. The muscles attached to the sense organ move the organ away from danger. In reflex actions, the signals do not travel up to the brain.

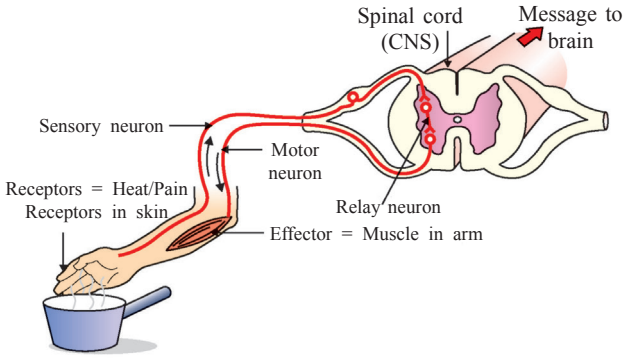
42. Name of asexual reproduction methods are given below.

- (i) Fission (ii) Budding (iii) Fragmentation (iv) Regeneration (v) Spore formation (vi) Vegetative propagation (vii) Propagation by tissue culture.
- For unicellular organisms, cell division, or fission, leads to the creation of new individuals. Many different patterns of fission have been observed. Many bacteria and protozoa simply split into two equal halves during cell division. In organisms such as amoeba, the splitting of the two cells during division can take place in any plane.
- The single-celled organisms, such as the malaria parasite, plasmodium, divide into many daughter cells simultaneously by multiple fission. Yeast, on the other hand, can put out small buds that separate and grow further.
- **Binary Fission in Amoeba :**



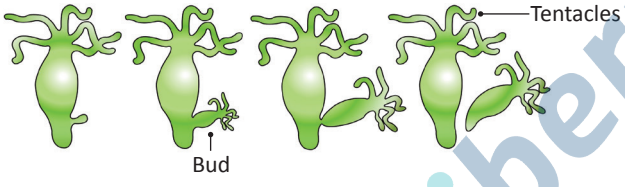
Binary fission in Amoeba

- Amoeba is a unicellular organism and just like bacteria, it reproduces through binary fission. After replicating its genetic material through mitotic division, the cell divides into two equal-sized daughter cells. In this method, two similar individuals are produced from a single parent cell.



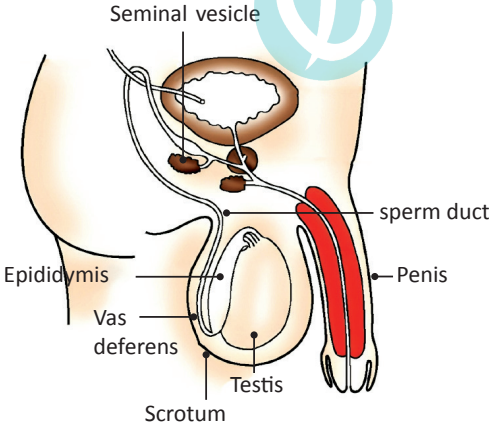
- A type of asexual reproduction in which a New individual or branch develops from an outgrowth on the body of a plant or certain lower animals. A form of asexual reproduction in living organisms is in which new individuals form from outgrowths (buds) on the bodies of mature organisms.

- **Budding in Hydra**



- Organisms such as hydra use regenerative cells for reproduction in the process of budding. In hydra, a bud develops as an outgrowth due to repeated cell division at one specific site. These buds develop into tiny individuals and when fully mature, detach from the parent body and become new independent individuals.

43.



- The functions of testes in humans are following:
- (i) After the stage of adolescent, testes produce male gametes in the human males which are called sperms.
- (ii) A hormone called testosterone is produced in testes. Testosterone controls the development of reproductive organs and secondary sexual characters.

44. Focal length, $f = -15$ cm (sign convention)

Image distance, $v = -10$ cm

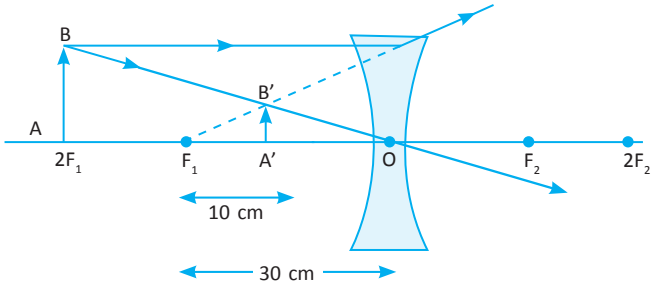
Object distance, $u = ?$

$$\therefore \frac{1}{u} = \frac{1}{v} - \frac{1}{f}$$

$$\therefore \frac{1}{u} = -\frac{1}{10} + \frac{1}{15}$$

$$= \frac{-3+2}{30} = -\frac{1}{30}$$

u = –30



▸ The object is placed 30 cm away from the lens.

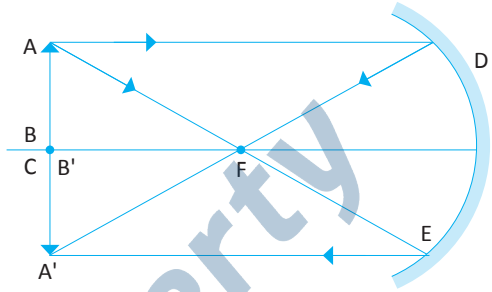
45. C. Position of Object : At C

➤ **Properties of Image :**

a Position : At C

b. Size : Same size as Object

c. Nature: Real and Inverted



➤ Shaving mirrors.

➤ Head mirrors.

➤ Astronomical telescopes.

➤ Headlights.

➤ Solar furnaces.

46. ➤ The heating effect generated by electric current is used in some everyday used appliances.

➤ e.g. In Iron, electrical toaster, electric oven, electric kettle and electric heater.

➤ Also uses electricity to get light e.g. electric bulb.

➤ The electric effect of current is also used in fuses to protect electrical circuits and electrical appliances by preventing overheating current.

Section-D

47. ➤ Chemeical formula : $CaOCl_2$

➤ **Bleaching Powder :**

➤ **Preparation :** Bleaching powder is synthesized by the action of chlorine gas (produced from the chlor-alkali process) on dry slaked lime $Ca(OH)_2$

Reaction : $Ca(OH)_2 + Cl_2 \rightarrow CaoCl_2 + H_2O$

Uses of bleaching powder

➤ It is used for bleaching dirty clothes in the laundry, as a bleaching agent for cotton and linen in the textile industry.

48. **pH Value in the digestive system**

➤ Our stomach generates HCl (Hydrochloric Acid) which helps in food digestion and kills germs.

➤ This acid balances the pH value of the stomach.

- Normally, the pH value of our stomach is around 1.2. However, this value may change when we consume more acidic or alkaline food.
- When the pH value of our stomach decreases we suffer from acidity.
- As a result, our stomach causes pain and irritation.
- Such problems can be cured by consuming basic substances like milk of magnesia which neutralizes the excess acid produced in our stomach.

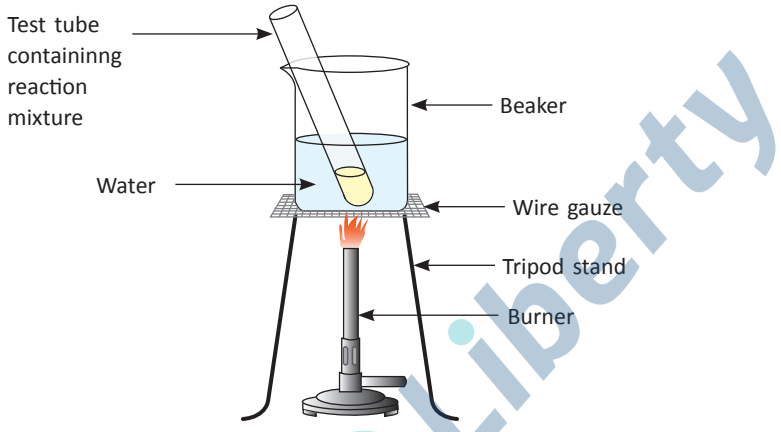
pH Value Changes Cause Tooth Decay

- Normally, the pH values of our mouth are around or lower than 5.5.
- This value changes when we eat or drink food.
- The changes can also lead to the decaying of our teeth.
- The tooth's enamel is made of calcium phosphate, which is insoluble in water. However, due to acid, it corrodes. Afterwards, the enamel teeth get sensitive and bad breath comes out of the mouth.

49. Esterification is defined as the chemical reaction of ethanol with ethanoic acid in presence of concentrated sulphuric acid by providing heat and results in formation of Ester i.e. Ethyl ethanoate. The chemical reaction involved is as follows:

- $CH_3COO + C_2H_5OH \xrightarrow{\text{conc. } H_2SO_4,\ \Delta} CH_3COOC_2H_5 + H_2O$

Experiment :



1. Take 2-3 ml of ethanol in a test tube.
2. Add 2-3 ml of glacial acetic acid along with a few drops of concentrated sulphuric acid to the test tube.
3. Allow the reaction mixture to heat in a water bath for 2 minutes.
4. Pour the contents of the mixture into a beaker which contains already 20-50 ml of water. This results in formation of a sweet smelling ester.

- Chemical properties

Ethanoic acid
1. Ethanoic acid + Sodium bicarbonate gives CO_2 gas. 2. On addition of alk. $KMnO_4$ the colour does not disappear.

50. The autotropic organisms take up substances for outside in the form of carbon dioxide and water in the presence of sunlight and chlorophyll. Which is converted into carbohydrates. Which is known as photosynthesis.

- Carbohydrates are utilized for providing energy to the plant.
- The carbohydrates which are not used immediately are stored in the form of starch.
- It serves as the internal energy reserve to be used as and when required by the plant.

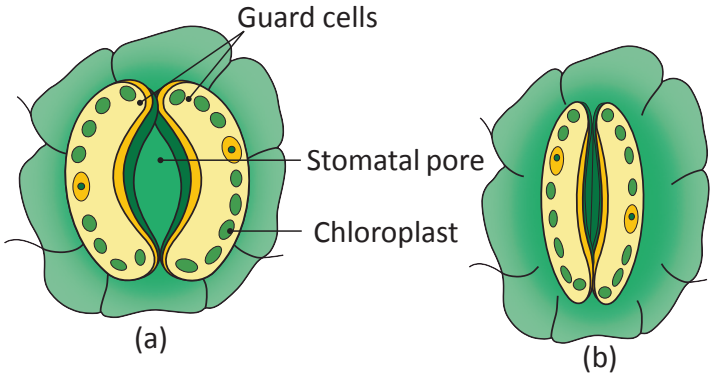
$$6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \underset{\text{Glucose}}{C_6H_{12}O_6} + 6O_2 + 6H_2O$$

➤ The following events occur during this process

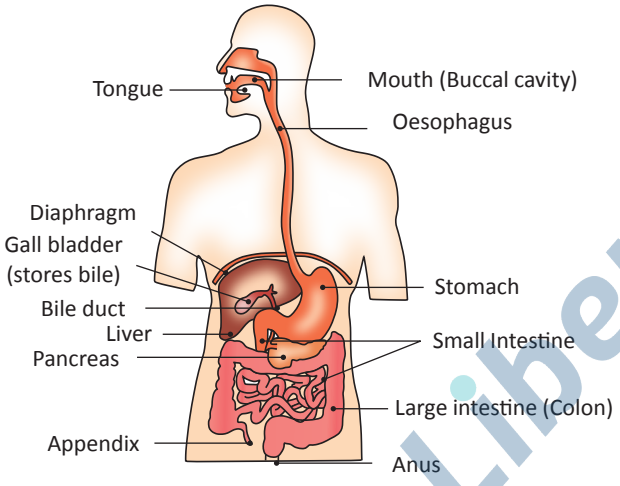
(i) Absorption of light energy by chlorophyll

(ii) Conversion of light energy to chemical energy and splitting of water molecule into hydrogen and Oxygen.

(iii) Reduction of carbon-dioxide to carbohydrate.



51.



➤ The main organs of human digestive system are mouth, food-pipe, stomach, small intestine and large intestine.

➤ **Mouth :**

➤ As we put food in mouth it will start to digest.

➤ The food has to be processed to generate particles which are small and of the same texture, This is achieved by crushing the food with our teeth.

➤ The food is also wetted to make its passage smooth by Saliva secreted by salivary gland. This is actually not only water but a fluid.

➤ The saliva contains biological catalyst called salivary amylase that breaks down the starch which is a complex molecule to give simple sugar.

➤ The lining of the canal has muscles that contract rhythmically in order to push the food forward.

➤ These peristaltic movements occur all along the gut.

➤ **Esophagus (Food-Pipe) :**

➤ From the mouth the food is taken to the stomach through the food pipe or oesophargus.

➤ **Stomach :**

➤ The stomach is a large organ which expands when food enters it.

➤ The muscular walls of the stomach help in mixing the food thoroughly with more digestive juices.

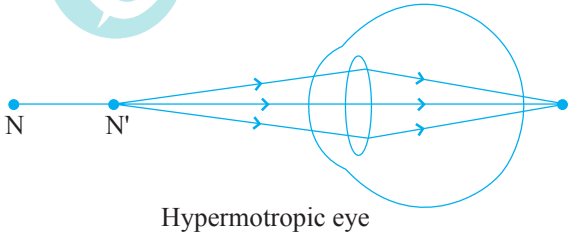
➤ The digestion in stomach is taken care of by the gastric glands present in the wall of the stomach.

➤ These release hydrochloric acid (HCl), pepsin and mucus.

- The hydrochloric acid creates an acidic medium which facilitates the action of the Enzyme pepsin and kill the bacteria which enters along with food in stomach.
- The mucus protects the inner lining of the stomach from the action of the acid under normal condition.
- **Small Intestine :**
- Now, food enters in small intestine from stomach.
- The exit of the food from stomach is regulated by a sphincter muscle.
- This is the longest part of the alimentary canal.
- Its the site of complete digestion of carbohydrates, proteins and fats.
- It receives a secretion of the liver and pancreas,
- The food coming from the stomach is acidic and has to be made alkaline for the pancreatic enzymes to act this is done by Bile juice released from liver.
- Bile salt break down large globular of fats into smaller globular increasing the efficiency of Enzyme action.
- The pancreas secret pancreatic juice which contains enzymes like.
  - Trypsin for digesting protein
  - Lipase for breaking down emulsified fat.
  - Amylase for breaking down of starch.
- The wall of the small intestine contains glands which secrete intestinal juice.
- The enzymes present in it finally convert the proteins to amino acids, complex carbohydrate into glucose and fat into fatty acid and glycerol.
- After a complete digestion the inner lining of the small intestine has numerous finger-like projections called villi. Which increase the surface area for absorption.
- The villi are richy supplied with blood vessels which take the absorbed food to each and every cell of the body.
- Digested food is utilized for obtaining energy building up new tissues and the repair of old tissues.
- **Large Intestine :**
- The unabsorbed food is sent into the large intesitne where its walls absorb more water from this material.
- The rest of the material is removed from the body via a the anus
- The exit of this waste material is regulated by anal sphincter.

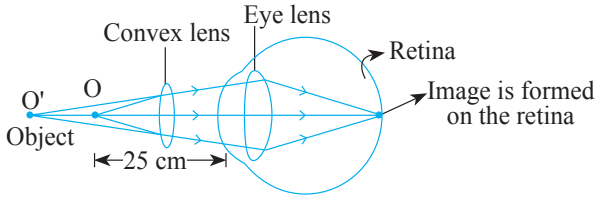
52. It is a kind of a defect in the human eye due to which, a person can see distant objects properly but cannot see the nearby objects clearly. It happens due to :

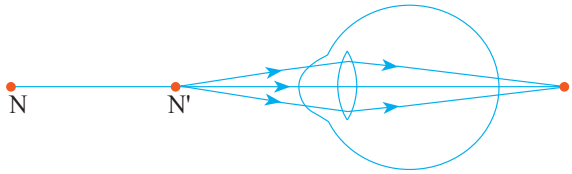
(1) Decrease in the power of eye lens i.e., increase in focal length of eye lens.
(ii) Shortening of eye ball.



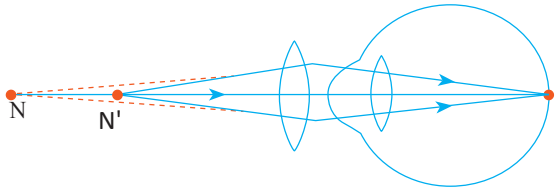
Hypermotropic eye

- A hypermetropic eye has its least distance of distinct vision greater than 25 cm.
- **Correction**
- Since a convex lens has the ability to converge incoming rays, it can be used to correct this defect of vision, as you already have seen in the animation. The ray diagram for the corrective measure for a hypermetropic eye is shown in the given figure.



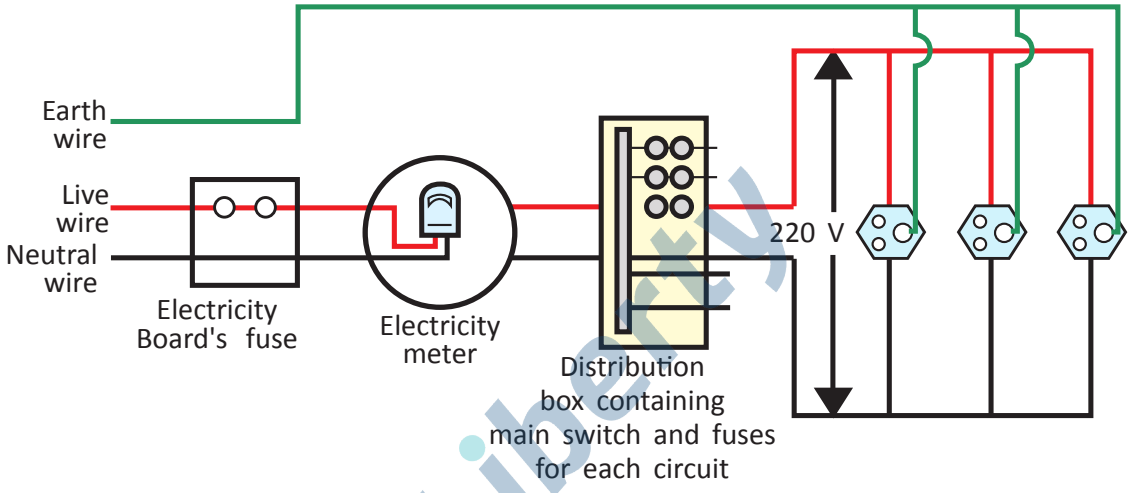


Hypermetropic eye



Correction for Hypermetropic eye

53.



- Two safety measures commonly used in electric circuit and appliance are electric fuse and earthing wire.
- **Electric Fuse :** When the current passing through the wire exceeds the maximum limit of the fuse element, the fuse melts to stop the current flow through the circuit, hence protecting, the appliances connected to the circuit.
- **Proper Earthing :** Any leakage of current in an electric appliance is transfered to the ground and people using the appliance do not get the shock.

54. ➤ Ozone is formed due to action of UV rays on oxygen molecules to form free oxygen atom which subsequently combines with another molecule of oxygen to form ozone. The reaction is :

➤ $O_2 \xrightarrow{UV} O + O$

$O + O_2 \longrightarrow O_3$

(Ozone)

- Ozone depletion is a cause of concern because it protects us from the harmful ultraviolet radiations of the Sun by absorbing them. The UV rays can cause skin cancer, ageing, cataract, etc. to human beings if they are not absorbed by ozone due to ozone depletion.

(i) Recycling :

- The solid wastes like paper, plastics and metals, etc. can be recycled.

(ii) Preparation of Compost :

- Biodegradable domestic wastes such as left over food, fruit and vegetable peels and leaves of potted plants, etc. can be converted into compost by burying in a pit dug into ground.