LIBERTY PAPER SET

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

Full Solution

Time : 3 Hours **ASSIGNTMENT PAPER 8**

Section-A

1. (D) 10 **2.** (D) Small intestine **3.** (C) Sperm duct **4.** (C) 25 cm **5.** (D) I=V/R **6.** (C) Genes **7.** Ketone **8.** Iodine **9.** amylase **10.** 1 **11.** light center **12.** Copper Carbonate($CuCO_3$) **13.** False **14.** True **15.** False **16.** False **17.** False **18.** (1-b),(2-c) **19.** Andre Mere Ampere **20.** "X" chromosomes are of X shape large size "Y" chromosomes are small in size. **21.** Optic Nerve **22.** Gibbereline **23.** (c) Chlorofluoro- carbons **24.** (a) Pesticides

Section-B

25. ➤ On mixing the clear solutions of two ionic compounds, a substance which is insoluble in water, is formed.

➤ This insoluble substance formed is known as precipitate.

➤ Any reaction that produces a precipitate is called a precipitation reaction.

➤ For example,

➤ When sodium sulphate solution is mixed with barium chloride solution, a white precipitate of $BaSO_4$ is formed by the reaction of SO_4^{2-} and Ba^{2+}

$$Na_2SO_4(aq) + BaCl_2(aq) \rightarrow BaSO_4(s) \downarrow + 2NaCl(aq)$$

26. ➤ **Alloy :** An alloy of two or more metals and non-metals is called an alloy.

➤ **Example :** Brass is an alloy of copper (Cu) and Zinc (Zn). Solder is an alloy of lead (Pb) and tin (Sn).

27.

Aerobic Respiration		Anaerobic Respiration	
(1)	It takes place in presence of oxygen.	(1)	It takes place in absence of oxygen.
(2)	End products are CO_2 and water	(2)	End products are ethanol or lactic acid.
(3)	It takes place in cytoplasm and mitochondria	(3)	It takes place only in cytoplasm.
(4)	Aerobic respiration produces a considerable amount of energy.	(4)	Much less energy is produced.

➤ Name of the some organisms that use anaerobic mode of respiration are yeast, E.coli, lactic acid bacteria.

28. a. New plants produced by vegetative propagation maintain the desirable characters of the parents plants. These plants are genetically identical.

b. Certain plants like bananas, grapes, pineapples, roses, jasmines, etc., do not form seeds. Thus, this is the only method of reproduction and continuation of such species.

c. This method is cheap and can be easily employed to reproduce plants, especially fruit plants.

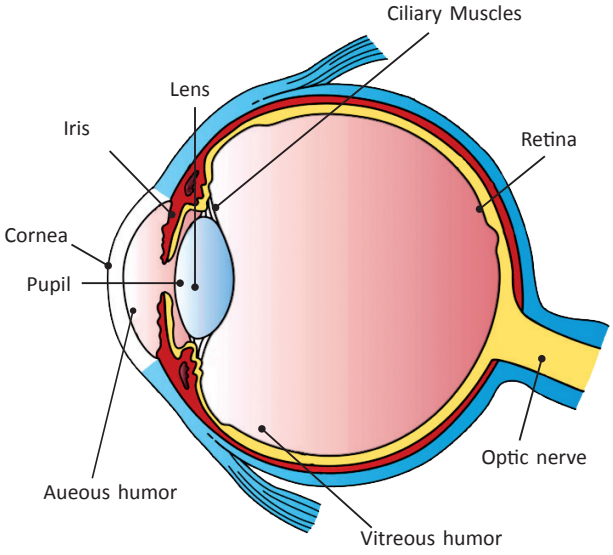
d. Only one parent is required for reproduction.

29. ➤ Yes, birth control pills are helpful to prevent pregnancy.

➤ Because these pills change the hormonal balance in which ovaluation does not occur.

➤ Hence fertilization can not happened.

30.



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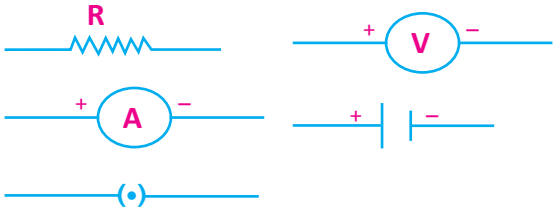
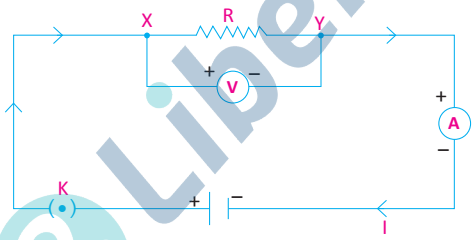


➤ The following electrical circuits can be constructed using the given symbol.



32. Here, the total power used

P = 100 + 400 = 500W

Total energy used by bulb and refrigerator in

10 days = 500W × 10 $\frac{\text{hours}}{\text{day}}$ × 10 days

= 50000 Wh

= $\frac{50000}{1000}$ kWh

= 50 kWh

cost for 1 kWh of energy = ₹ 8

∴ cost for 50 kWh of energy = 8 × 50 ₹

= 400 ₹

➤ The cost of running a bulb and a refrigerator for 10 days is ₹ 400.

33. ➤ 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.

34. ➤ **(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.

35. ➤ The length and complexity of food chains vary greatly.

➤ Each organism is generally eaten by two or more other kinds of organisms which in turn are eaten by several other organisms.

➤ So, instead of a straight line food chain, the relationship can be shown as a series of branching lines called a food web.

36. ➤ Insulin hormone regulates blood sugar levels. If this is not secreted in proper amounts, the sugar level in the blood rises. This causes many harmful effects.

➤ To treat harmful effects of increased level of blood sugar, the diabetic patients are treated by giving injections of insulin.

37. ➤ Maximum force is applied on the rod when the direction of current flowing through the conductor rod is perpendicular to the direction of the magnetic field.

The value of the magnetic field produced due to the current flowing in a straight conductor depends on :

➤ The value of current flowing through the conductor wire.

➤ The distance from the conductor wire to the compass.

Section-C

38. ➤ (a) Name the substance 'x' and write its formula.

The substance 'x' used for white washing is quicklime (Calcium oxide). Its formula is CaO.

➤ (b) Write the reaction of the substance 'x' with water.

➤ When quicklime is mixed with water, Calcium hydroxide (Slakedlime) is formed.

$CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(aq) + Heat$

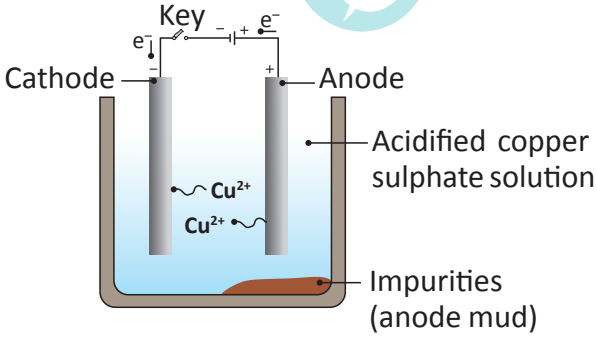
39. ➤ The metals produced by various reductions processes are not very pure.

➤ They contain impurities, which must be removed to obtain pure metals. The most widely used method for refining impure metals is electrolysis refining.

➤ Many metals Copper, Zin, Tin, Nickel, Silver, Gold etc. are refined electrolytically.

➤ In this process the impure metal is made the anode and a thin strip of pure metal is made the cathode.

➤ A solution of the metal Salt is used as an electrolyte.



➤ The apparatus is set up as shown in figure.

➤ On passing the current through the electrolyte, the pure metal from the anode dissolves into the electrolyte.

➤ An equivalent amount of pure metal from the electrolyte is deposited on the cathode.

➤ The soluble impurities go into solution, whereas the insouble impurities settle at the bottom of the anode and are known as anode mud.

40. ➤ More reactive metals displace less-reactive metals from their compounds.

➤ This process is highly exothermic.

➤ In these types of displacement reaction, amount of heat evolved is so large that the metal produced in such reaction is in molten state.

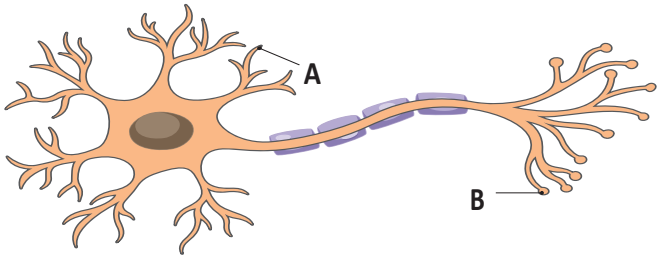
➤ **Example :**

➤ When ferric oxide (III) is heated with aluminum (Al), iron (III) oxide is reduced to iron metal.

$Fe_2O_3(g)$	+	2Al	→	2Fe(l)	+	$Al_2O_3(s)$ + heat
Ferric oxide		Aluminium		Iron metal		Aluminium oxide

➤ This reaction is known as Thermit reaction. Thermit reaction is used in joining of railway tracks or cracks in machine parts.

41.



(a) Name the part 'A' and write its function.

➤ A is a Dendrite

➤ **Function :** Electrical impulses produced by chemical process.

(b) Name the part 'B'. Write its function.

➤ B is an Axon terminal

➤ **Function :** Electrical impulses release some chemical Substances.

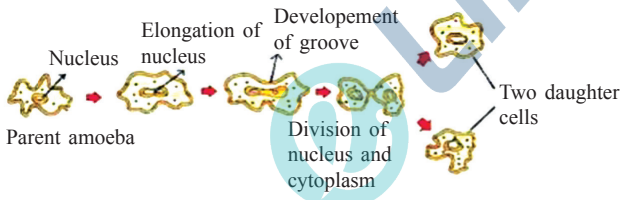
42. ➤ Name of asexual reproduction methods are given below.

➤ (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.

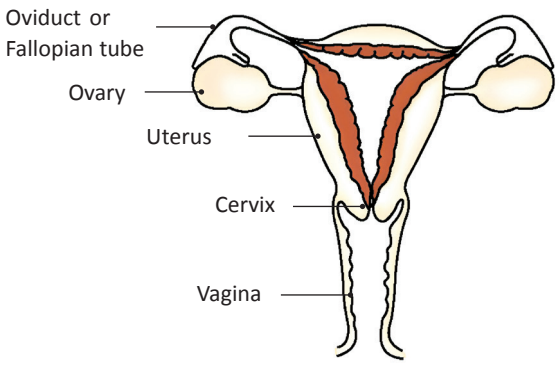
➤ **Binary Fission in Amoeba :**



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.

43.



➤ Female reproductive organs are listed below.

➤ Ovary, Fallopian tube, Uterus, Cervix, Vagina

➤ **Ovary :**

➤ They are in pair.

- The ovaries contain thousands of immature eggs from the time a girls is born.
- On reaching puberty, some of these start maturing. One egg is produced every month by one of the ovaries.

Fallopian Tube :

- They are in pair.
- The egg is carried from the ovary to the womb through a thin oviduct or fallopian tube.

Uterus :

- The two oviducts unite into an elastic bag like structure known as the uterus.
- It is delicate and resilient.
- It is shaped like an upside down pear.
- The embryo is implanted and developed in the uterus.

Cervix :

- The lower end of the uterus is known as the cervix.

Vagina and Vaginal Passage :

- The uterus opens into the vagina through the cervix, which receives sperm through the penis.
- Vagina opens through the vaginal passage outside the body.

44. ➤ **Solution :**

Object size : h = (+4 cm)
Object distance : u = (–25cm)
Focal length : f = (–15 cm)
Image distance : v = ?
Image height : h' = ?

➤ **Mirror formula is given by :**

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

$$\frac{1}{-15} = \frac{1}{-25} + \frac{1}{v}$$

$$\frac{1}{-15} + \frac{1}{-25} = \frac{1}{v}$$

$$\frac{1}{v} = \frac{25-15}{-375}$$

$$\therefore v = -37.5 \text{ cm}$$

➤ The image is enlarged and its height is 6 cm. The negative sign shows it is real and inverted.

$$m = \frac{-v}{u} = \frac{h_i}{h_o}$$

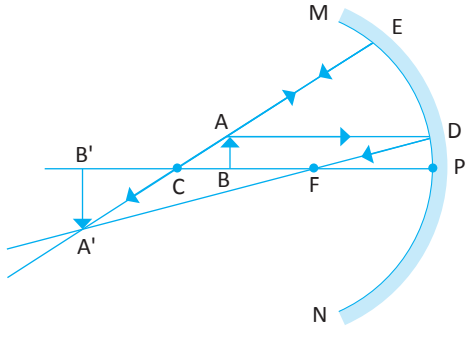
$$m = \frac{-(37.5)}{-25} = \frac{h_i}{4}$$

$$h_i = \frac{150}{25} = -6 \text{ cm}$$

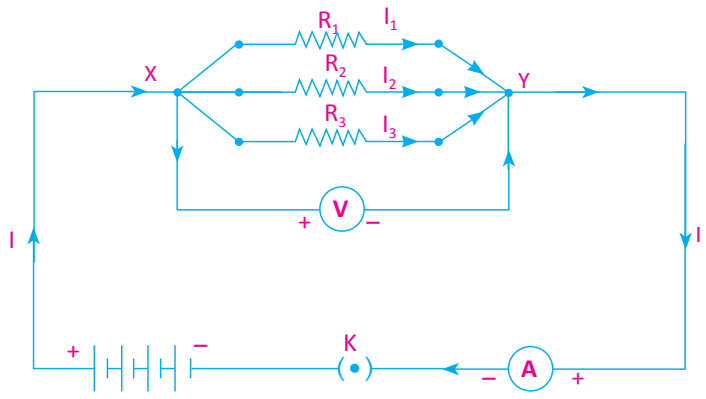
45. D. Position of Object : Between C and F

Properties of Image :

a. Position : C and F
b. Size : Larger than Object
c. Nature : Real and Inverted



46. ➤ If two or more resistor are connected in such a way that the ends on one side of them are connected to one common point and the ends on the other side are connected to another common point, then the connection of such resistor is parallel.



- As shown in figure connect R_1, R_2 and R_3 resistor in parallel with combination of cells.
- The total current I, is equal to the sum of the separate currents through each branch, of the combination.
- $I = I_1 + I_2 + I_3$ ... ... (1)
- Let R_p be the equivalent resistance of the parallel combination of resistors. By applying Ohm's law to the parallel combination of resistors we have
- $I = \frac{V}{R_p}$ ... ... (2)

On applying Ohm's law to each resistors.

$$I_1 = \frac{V}{R_1}$$

$$I_2 = \frac{V}{R_2}$$

$$I_3 = \frac{V}{R_3} \quad \text{... ... (3)}$$

From equation no. (1) and (2)

$$\frac{V}{R_p} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3} \quad \text{OR}$$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \quad \text{... ... (4)}$$

- Thus, we can conclude that the reciprocal of the equivalent resistance of a group of resistance joined in parallel is equal to the sum of the reciprocals of the individual resistances.

Section-D

47. ➤ In kitchen my mom uses baking soda to make crispy pakoda or cakes.

Its chemical formula is $NaHCO_3$ (Sodium Hydrogen Carbonate)

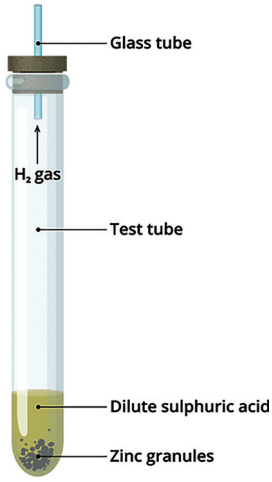
Formation of baking soda :

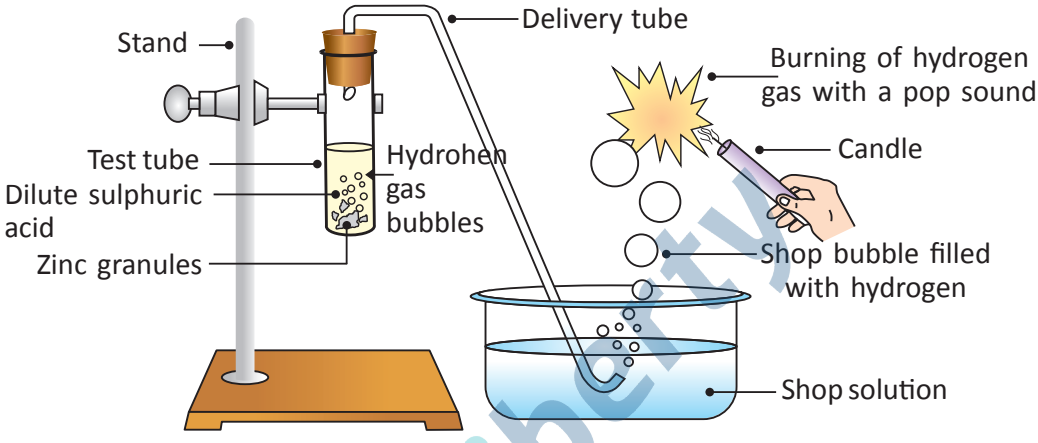
When we pass carbon dioxide and ammonia gas through aqueous sodium chloride we get baking soda.

$NaCl + H_2O + CO_2 +$	NH_3 $\rightarrow$	$NH_4Cl +$	$NaHCO_3$
Sodium Chloride	Ammonia Chloride	Ammonium	Sodium hydrogen carbonate

48. Activity 2 : Reaction of Zinc granules with dilute sulphuric acid and testing hydrogen gas by burning.

- Reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning.
- Take one test tube, a beaker and stand to set the apparatus as shown in the figure.
- Take 5ml of dil. Sulphuric acid in a test tube and add a few pieces of zinc granules to it.
- Take soap solution in a beaker.
- Dilute sulphuric acid and zinc granules react to form zinc sulphate and hydrogen gas.
- This hydrogen gas when passed through soap solution causes the agitation of the mixture resulting in the formation of bubbles.
- Moreover, as particles of soap are already interacting with water, they do not react with hydrogen gas.
- Bubbling of gas thus results in the formation of bubbles.
- When burning candle is brought near bubbling gas, it burns with pop sound, which shows the presence of hydrogen gas.





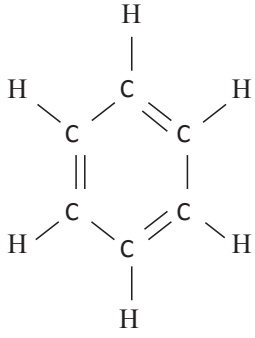
Reaction of acid with metal

Acid + Metal → Salt + Hydrogen gas

$H_2SO_4 + Zn \rightarrow ZnSO_4 + H_2$

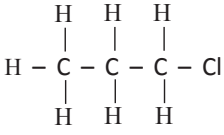
49. (a) (i) Benzene

Molecular formula of Benzene



(ii) Chloro-Propane

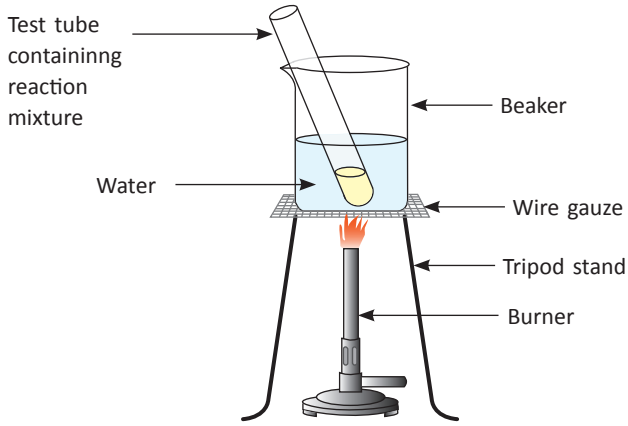
Molecular formula of chloro-propane :



(b) 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:

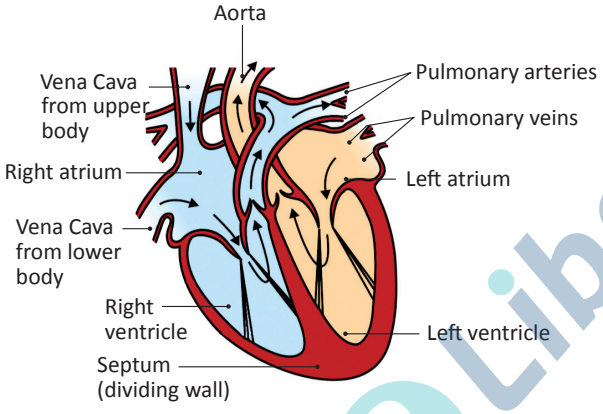
$$CH_3COO + C_2H_5OH \xrightarrow{\text{conc. } H_2SO_4,\ \Delta} CH_3COOC_2H_5 + H_2O$$

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.

50.

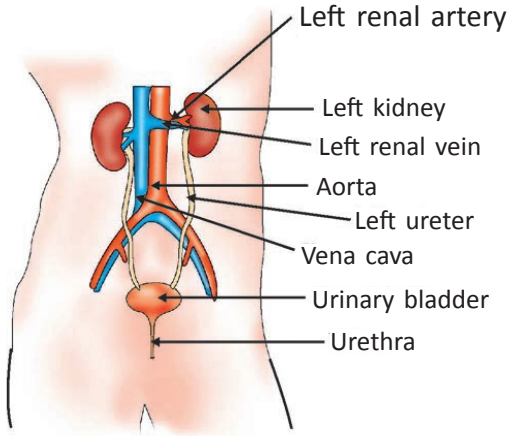


Schematic sectional view of the human heart

- **Entry of oxygen in the blood through lungs:**
- Deoxygenated blood from various organs of the body is received by the right atrium through the superior and inferior vena cava.
- At the same time left atrium receives oxygenated blood from the lung through the pulmonary veins.
- Now both the atria contract and the deoxygenated blood from right atrium is poured into right ventricle and oxygenated blood from left atrium is poured into left ventricle.
- Now both the ventricles contract. Due to contraction of right ventricle, the blood enters into lungs through arteries.
- In lungs CO_2 is released from blood and O_2 diffuses into it. While due to contraction of left ventricle, oxygenated blood is distributed to all the parts of the body through the aorta.
- The separation of both types of the blood in the heart allows a highly efficient supply of oxygen to the body.
- This is useful in the animals which have high energy need, such as birds and mammals, which constantly use energy to maintain their body temperature.

51.

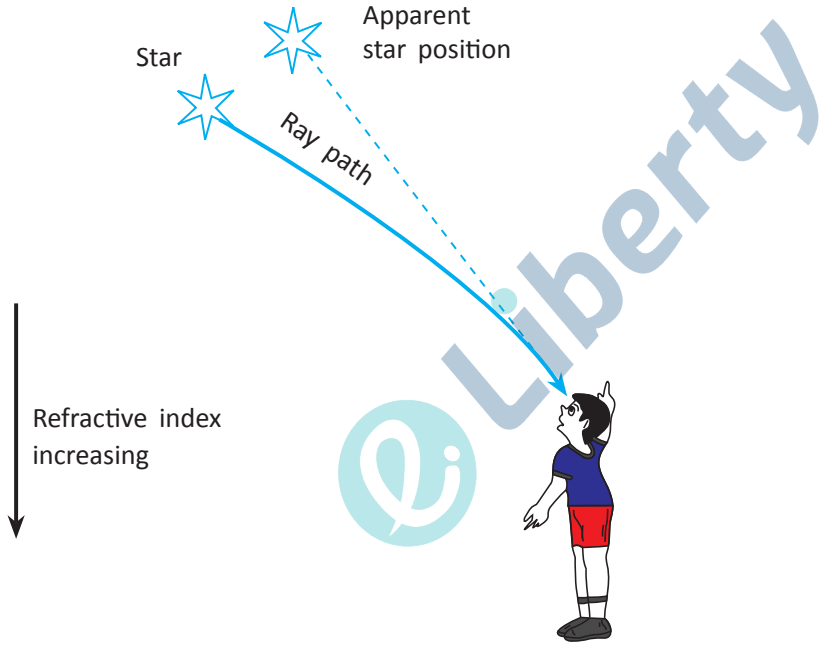
- The excretions system of human beings includes a pair of kidneys, a pair of ureter, a urinary bladder and a urethra.
- Kidneys are located in the abdomen one on either side of the backbone.
- Urine produced in the kidneys passes through the ureters into the urinary bladder where it is stored until it is released through the urethra.



Excretory system in human beings

52. (a) Stars appear to twinkle due to atmospheric refraction. The light of stars after the entry of light in earth's atmosphere undergoes refraction continuously till it reaches the surface of the earth. Stars are far away.

➤ So, they are the point source of light. As the path of light coming from stars keep changing, thus the apparent position of stars keeps changing and amount of light from stars entering the eye keeps twinkling, Due to which a star sometimes appears bright and sometimes dim, which is the effect of twinkling.



53.
➤ Electric fuse is an important component of all domestic circuits.
➤ A fuse in a circuit prevents damage to the appliances and the circuit due to overloading.
➤ Overloading can occur when the live wire and the neutral wire come into direct contact.
➤ In such a situation, the current in the circuit, abruptly increases. This is called short-circuiting.
➤ The use of an electric fuse prevents the electric circuit and appliance from a possible damage by stopping the flow of unduly high electric current.
➤ The joule heating that takes place in the fuse melts it to break the electric circuit.
➤ Overloading can also occur due to an accidental hike in the supply voltage.
➤ Overloading is caused by connecting too many appliances to a single socket.
➤ The following precautionary measures should heva been taken by to prevent the fire due to overloading in the domestic electrical circuit :
➤ A suitable fuse connected in the electrical circuit.
➤ The insulating layer on live and neutral wire should be properly laid.
➤ No more than one device should be connected in the same socket.
➤ Each device should be connected in parallel with each-other.
➤ The circuit of the house should be properly earthened with devices made of metal.

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.

➤ The main responsible compounds in ozone depletion are chlorofluorocarbons (CFCs)

➤ Chloroflurocarbons (CFCs) are used in refrigerators as well as fire-extinguishers.

➤ Ozone (O_3) is an isotope of oxygen, i.e., it is a molecule formed by three atoms of oxygen.

➤ At the higher levels of the atmosphere, ozone performs an essential function. It shields the surface of the earth from ultraviolet (UV) radiations from the sun. These radiations are highly damaging to organisms. Ultraviolet rays can cause skin cancer.