LIBERTY PAPER SET

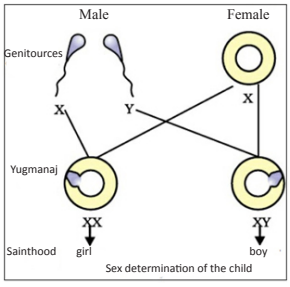
STD. 10 : Science [N-011(E)]

Full Solution

Time : 3 Hours **ASSIGNTMENT PAPER 6**

Section-A

1. (C) Vanilla extract **2.** (D) C_4H_8 **3.** (D) (iii) And (iv) **4.** (B) ii **5.** (A) T_1 **6.** (C) Refraction, diffraction and internal reflection **7.** 18 **8.** Black **9.** Protein **10.** Growth Hormone **11.** 25 % **12.** 2.3 **13.** True **14.** False **15.** False **16.** True **17.** False **18.** Spincter Musle **19.** Retina **20.** Tungsten **21.** Inverse of focal length of lens in known as power of lens. **22.** United Nations Environmental Programme **23.** (a-ii, b-iii) **24.**



Section-B

25. When white silver chloride is placed in sunlight, it turns grey.

$2AgCl(s) \rightarrow 2Ag(s) + Cl_2(g)$

- It is a Photolytic Decomposition Reaction.
- So, it stored in brown bottle. (Dark coloured bottle)

26. ➤ **The common characteristic of non-metals elements are listed below :**

(i) The non-metals are either solids or gases.
Exception : Bromine is liquid in nature.
(ii) Non-metallic elements are light in weight.
(iii) Non-metallic elements do not have gloss.
Exception : Iodine
(iv) The melting point of non-metallic elements is low.
(v) Non-metallic elements are bad conductors of electricity.
(vi) Non-metals do not produce sound.
(vii) Non-metallic elements do not have the property of ductility or malleability.

27. ➤ Through the pores in the capillary wall some of the blood, proteins and blood cell exit into the intracellular space of the tissue and form lymph.

- Function of lymphatic system.
- (i) Lymph caries digested and absorbed fat from intestine.
- (ii) Drains excess fluid from extra cellular space back into the blood.

28. In the mother's body, the embryo gets nutrition from the mother's blood. For this, there is a special structure, called placenta. Placenta contains villi. There are empty spaces in mother's tissues that cover the villi. It provides a large surface area for the transfer of glucose, oxygen and other substances from the mother to the embryo.

29. 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.

➤ (i) Both seminal vesicle and prostate gland secrete fluids which form a part of the semen. The fluid secreted from

seminal vesicle forms 60% of semen while the fluid secreted from the prostate gland forms 30% of the semen. It makes the path smooth through which the sperms travel.

(ii) This fluid protects the sperms from the acids present in the urethra.

(iii) This fluid provides nutrition to sperms in the form of fructose, calcium and some enzymes.

30. Planets are much nearer to the earth than stars and because of this they can be considered as a large source of light.

➤ If a planet is considered to be a collection of a very large number of point sources of light, then the average value of change in the amount of light entering the eye from all point size light sources is zero. Due to this the effect of twinkling is nullified.

31.

Sr. No.	Components	Symbols
1.	Plug key or switch (open)	
2.	Plug key or switch (closed)	
3.	A wire Joint	
4.	Wires crossing without joining	

32. Because it has low Resistivity & High melting Point.

This kind of core property makes it appropriate to use as filament in bulb.

33. Earth wire is a safety measure that provides a low resistance conducting path to the current. Sometimes due to excess heat or wear and tear, the live wire comes in direct contact with the metallic cover of the appliances, which can give an electric shock on touching them. To prevent then from the shock, the metallic part is connected to the earth through a three-pin plug due to which the current flows to the earth the movment there is a short circuit.

➤ It is necessary to earth metallic appliances because it ensures that if there is any current leakage in the metallic cover, the potential of the appliance becomes equal to that of the earth. The potential of the earth is zero. As a result, the person handling the appliance will not get an electric shock.

34.

BIODEGRADABLE WASTES	NON-BIODEGRADABLE WASTES
• They can be broken down into non- poisonous substances by the action of microorganisms. • They change their form and structure over time and become harmless. • They do not pollute the environment. • Examples: Spoilt food, vegetable peels, paper, leather etc.	• They cannot be broken down into harmless substances by any biological processes. • They remain unchanged over a long period of time. • They continue to pollute the environment. • Examples: Glass bottles, metal cans, polythene bags, synthetic fibres etc.

35. The use of several pesticides and other chemicals to protect our crops from diseases and pests, 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 plant and animals.

➤ This is one of the ways in which they enter the food chain.

➤ These chemicals are not degradable, and get accumulated progressively at each trophic level.

➤ Food grains, such as wheat, rice vegetables and fruits and even meat, contain varying amounts of pesticides residues.

➤ They cannot always be removed by washing or other means.

36. Small finger like projection villi are located in the wall of the small intestine for the absorption of digested food or substance which increase the surface area of the small intestine.

- The large number of blood vessels present in villi absorb food and deliver it to every cell in the body.

37.
- 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.

Section-C

38.
- The type of reactions in which one substance breaks down into two or more substances.
- This type of reactions requires energy either in the form of heat, light or electricity to decompose substance.
- **Examples :**
- **(i) Thermal Decomposition :**
- Decomposition of reactant takes place in the presence of heat.

$$2FeSO_4 \xrightarrow{Heat} Fe_2O_3(s) + SO_2(g) + SO_3(g)$$

Ferrous Sulphate — Ferric Oxide

- **(ii) Electrolytic Decomposion :**
- Decomposition of substance takes place in the presence of electricity.

$$2H_2O(l) \xrightarrow{Electricity} 2H_2(g) + O_2(g)$$

Water — Hydrogen

- **(iii) Photolytic Decomposition :**
- Decomposition of substance takes place in the presence of sunlight.

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

39.
- Nail in A will corrod
- Nail in B will not rusted
- Nail in C will not rusted
- Running will only take place in presence of oxygene water.
- So, alone or water command .....

40. (a) Reaction of Magnesium with diluted sulphuric acid.

$$Mg(s) + H_2SO_4(aq) \rightarrow MgSO_4(aq) + H_2(g)$$

Magnesium — sulphuric acid — magnesium sulphate — hydrogen

(b) Reaction of Aluminium with diluted sulphuric acid

$$2Al(s) + 3H_2SO_4(aq) \rightarrow Al_2(SO_4)_3(aq) + 3H_2(g)$$

Aluminium — Sulphuric Acid — Aluminium sulphate — hydrogen

(d) Reaction of Iron with diluted sulphuric acid

$$Fe(s) + H_2SO_4(aq) \rightarrow FeSO_4(aq) + H_2(g)$$

Iron — Sulphuric acid — Iron sulphate — hydrogen

41.
- The Human brain consist of three parts.

(i) The Forebrian
(ii) The Mid brain
(iii) The Hind brain.

(i) The Fore Brain :
- The fore-brain is the main thinking part of the brain.
- The cerebellum is the largest and most complex part of the brain.

- It has regions which receive sensory impulses from various receptors.
- There are separated areas specialized for hearing, touch, sight, temperature etc.
- It has stimulatory centers that control the movement of voluntary muscle.
- The Appetite center is located in the frontal lobe of the brain.

(ii) Mid-Brain :

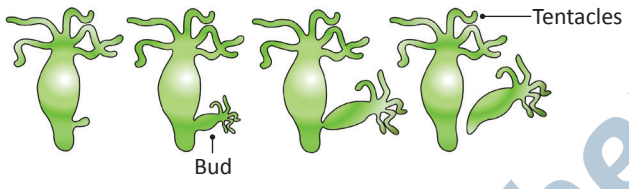
- It is smallest part of brain.
- It contain four swollen region which causes reflex movement of head and neck.
- These are also related to sight reflexes and auditory reflexes in response to light and sound respectively.

(iii) Hind-Brain :

- It forms the involuntary part of the brain. It consist of three-parts pons, cerebellum, and medulla oblongata.
- The pons regulated the action of the respiratory system.
- The cerebellum maintains the balance of the body and coordinates the action of bodily movement. e.g. dancing, walking, cycling etc. Medulla oblogata controls involuntary actions such as blood pressure, salivation, coughing, sneezing, swallowing, vomiting etc.

42. ➤ 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. **Adolescence**

- The age at which the reproductive organs become active and the boy and girl reach sexual maturity is called puberty. So the growth of the body slows down and the reproductive muscles begin to mature. This period of adolescence is called puberty.
- Some physical and sexual changes are similar in boys as well as girls. For example.
- Hair grows in the middle genital area of the armpits and thighs and is also dark in colour.
- Thinner hair can be also appear on legs and arms as well as on face.
- The skin frequently becomes oily and might begin to develop pimples.
- Some changes taking place are different between boys and girls.

In Girls :

- Breast size begins to increase, with darkening of the skin of the nipples at the tips of the breast.
- Menstruation cycle will start.

In Boys :

- New thick hair growth on the face.
- Voice begins to crack.
- The penis occasionally begins to become enlarged and erect.

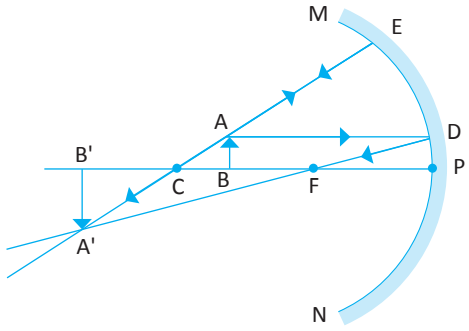
44. D. Position of Object : Between C and F

➤ **Properties of Image :**

a. Position : C and F

b. Size : Larger than Object

c. Nature : Real and Inverted



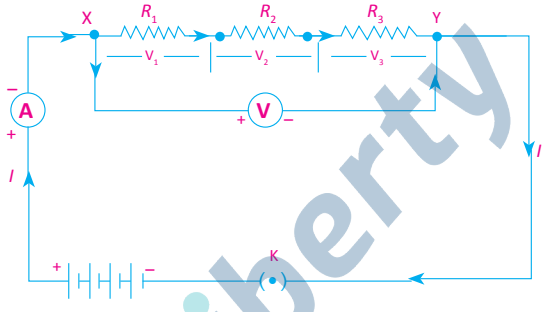
45. ➤ Explanation of Important Terms

➤ **Principal axis :** An imaginary line drawn through the principal focus and the optical centre is called principal axis.

➤ **Focus or Focal point :** The parallel rays coming from an object after undergoing refraction will meet on the other side of lens or appear to meet on the same side of the lens in a point. This point is called focal point or focus.

➤ **Optical centre :** The Optical centre of the lens is defined as the point that lies on the principal axis through the rays of light pass through without any deflection.

46. ➤ When two or more than two resistors joined end to end, the resistors are said to be connected in series.



➤ As shown in figure Resistor R_1, R_2, R_3 are connected together between points X and Y.

➤ Here, the current through each resistor is also I.

➤ The potential difference V is equal to the sum of potential difference. V_1, V_2 and V_3.

➤ That is the total potential difference across a combination of resistors in series is equal to the sum of potential difference across the individual resistors.

➤ $V = V_1 + V_2 + V_3$ ... ... (1)

Suppose, Rs is equivalent resistor for series connection of resistors.

Applying the Ohms law to the entire circuit.

$V = IR_s$ ... ... (2)

Applying the Ohm's law for all resistors

(R_1, R_2 and R_3)

$V_1 = IR_1$, $V_2 = IR_2$ and $V_3 = IR_3$ ... ... (3)

From equation no. (1), (2) and (3)

$IR_s = IR_1 + IR_2 + IR_3$

$\therefore R_s = R_1 + R_2 + R_3$ ... ... (4)

➤ We can conclude that when several resistors are joined in series. the resistance of the combination R_s equals the sum of their Individual Resistance R_1, R_2, R_3 and thus greater than Individual resistance.

Section-D

47. ➤ **Chlor-alkali action :**

➤ When electric current is passed through an aqueous solution of sodium chloride it decomposes to form sodium hydroxide. This method is performed by chlor-alkali action. This is because the products produced in this method are chlorine and sodium hydroxide.

$2NaCl(aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2(g) + H_2(g)$

sodium chloride	sodium hydroxide	chlorine gas

Use of Sodium Hydroxide :

- To remove grease from metals.
- In manufacturing process of soaps and detergents.
- In the manufacturing process of paper and synthetic fibers.

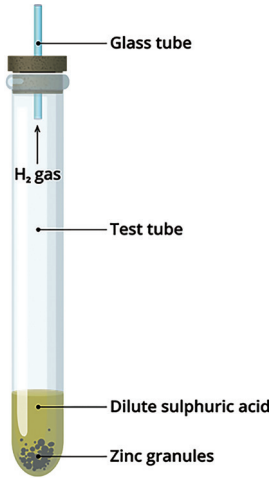
Uses of Chlorine Gas

- For Hydrotherapy action.
- In the manufacturing process of PVC.
- In the creation of CFCs.
- In the manufacturing process of pesticides.
- In swimming pools.

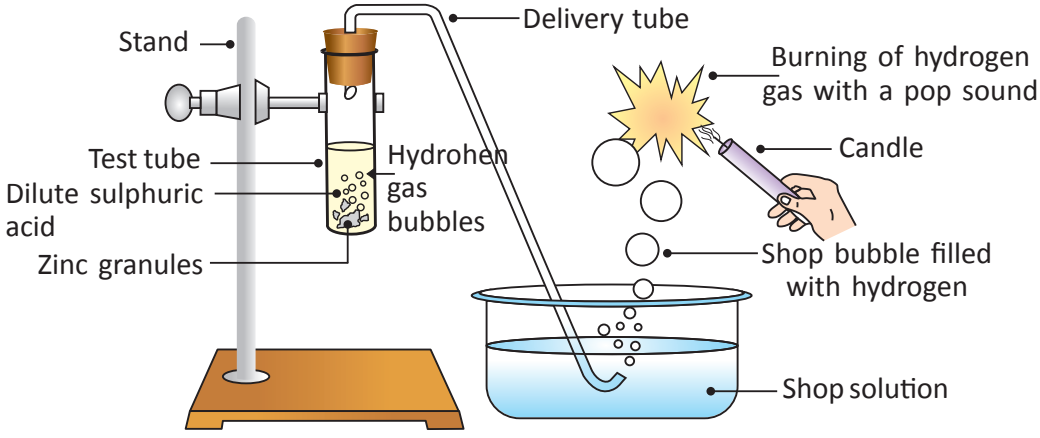
Uses of Hydrogen Gas

- As fuel.
- In manufacturing of Ammonia.
- As a margarine.

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.

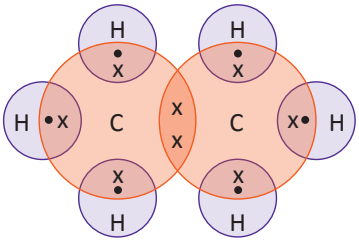


➤ **Reaction of acid with metal**

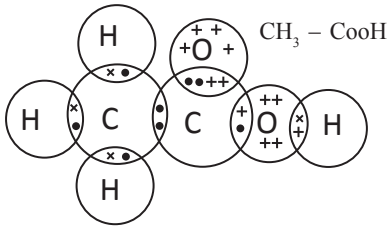
Acid + Metal → Salt + Hydrogen gas

$H_2SO_4 + Zn \rightarrow ZnSO_4 + H_2$

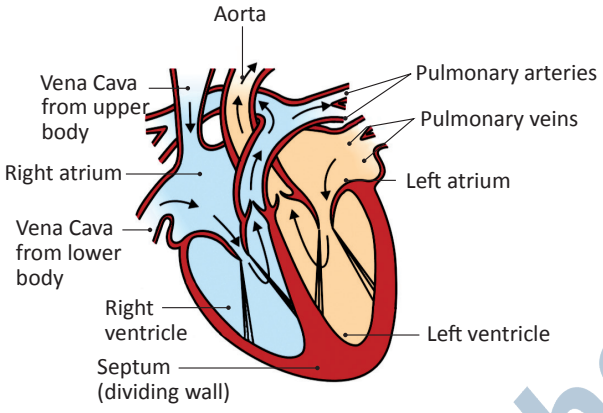
49. Electron dot structure Ethane C_2H_6



ELECTRON DOT STRUCTURE OF ETHANOIC ACID



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. ➤ Human respiratory system consists of nostril, nasal passage, pharynx, laropharynx, trachea, bronchi, lungs and diaphragm.

➤ Nostrils open into nasal cavities.

➤ The air for respiration is drawn into our body through nostril. This air then goes into nasal cavity.

➤ The nasal cavity is lined by fine hairs and mucus.

➤ The dust particles and microbes in the air get trapped in mucus of the nasal cavity.

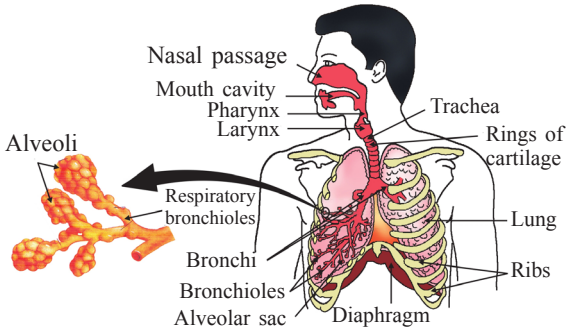
➤ Nasal cavity ends in internal nostril through which air passes to pharynx. The pharynx leads to trachea, through a slit called glottis.

➤ Glottis is protected by a cartilaginous flap like epiglottis.

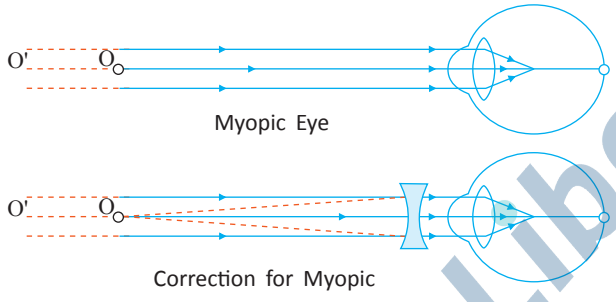
➤ While swallowing food, glottis is covered by the epiglottis so food cannot enter the trachea.

➤ Trachea does not collapse even when there is no air because it is supported by 'C' shaped cartilaginous ring.

- At the upper end trachea has a voice box known as larynx.
- Trachea runs down the neck and divides into two bronchi which lead into the lungs.
- Each bronchus divides in the lungs and form many smaller bronchioles.
- The smallest bronchioles terminate into alveoli. The wall of the alveoli is thin and covered by blood capillaries. In alveoli the gaseous exchange takes places.



52. - The child is suffering from myopia.
- This defect may arise due to
  (i) Excessive curvature of the eye-lens
  (ii) Elongation of eye-ball
- This defect can be corrected by using a concave lens of suitable power.
- A concave lens of suitable power will bring the image back on to the retina and thus the defect is corrected.



53. (a) What does the concentric circle represent in that activity ?
- The concentric circles represent the magnetic field lines.

(b) How to find the direction of magnetic field arising in this activity ?
- In this activity, adjust the compass near any point of the circle.
- The north pole of the compass needle, shows the direction of the magnetic field arising near that point by the current flowing through the straight wire.

(c) If the current flowing through the copper wire is changed, what will be the change in the angle of the needle of the compass ? What does that show ?
- If the current flowing through the copper wire is changed, then the angle of the needle of the compass also changes.
- If the flow is increased then the angle also increases which shows that increase in value of the current flowing through the wire also increase the value of the magnetic field produced at a given point.

(d) If the current flowing through the copper wire is the same, but the compass is moved away from the copper wire, what is the change in the angle of the compass needle ? What does that show ?
- If the current flowing through the copper-wire is the same, but the compass needle angle decreases when the compass is moved away from the copper wire, which shows that the magnetic field produced by the current flowing through a conductor decreases as it moves away from the conductor.

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 :

$$O_2 \xrightarrow{UV} O + O$$

$$O + O_2 \longrightarrow \underset{\text{(Ozone)}}{O_3}$$

- 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.

- 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.