LIBERTY PAPER SET

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

Full Solution

Time : 3 Hours **ASSIGNTMENT PAPER 7**

Section-A

1. (C) Ag_2S **2.** (A) Virtual and small **3.** (A) Round and yellow **4.** (C) Deviation angle **5.** (B) Double bonds only **6.** (D) All of the above **7.** Potassium **8.** Catenation **9.** guard cells **10.** Volt **11.** testes **12.** DNA **13.** True **14.** True **15.** False **16.** False **17.** False **18.** Na_2 ZnO_2 = Sodium Zincate **19.** Change in thickness of lens and alter the focal lengths **20.** Refraction, Diffraction, Internal Reflection **21.** (iv) Regulation of ovarian-metabolic function **22.** Insuline **23.** (b) Plants and animals **24.** (a) Plastic and glass

Section-B

25. (a) Hydrogen sulphide gas burns in air to give water and sulphur dioxide.

(a) $\mathbf{H_2S + O_2 \rightarrow SO_2 + H_2O}$

$2H_2S + 3O_2 \rightarrow 2SO_2 + 2H_2O$

(b) Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate.

(b) $\mathbf{3BaCl_2 + Al(SO_4)_3 \rightarrow 3BaSO_4 + 2AlCl_3}$

$BaCl_2 + Al(SO_4)_3 \rightarrow BaSO_4 + AlCl_3$

26. (a) Mercury (Hg)

(b) Sodium (Na) and Potassium (K)

(c) Silver (Ag) and Copper (Cu)

(d) Lead (Pb) and Mercury (Hg)

27. $6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \underset{\text{Glucose}}{C_6H_{12}O_6} + 6O_2 + 6H_2O$

28. An organism is benefited by reproducing through the spores because spores are surrounded by a thick layer which protects them in adverse conditions. When favourable conditions occur, these spores start to grow again. In this way they successfully live in unfavourable conditions.

29.

	Binary Fission	Multiple Fission
1	In binary fission, the parent cell is divided into two daughter cells.	In multiple fission, the parental cell is divided into many daughter cells.
2	In binary fission division occurs one time.	In multiple fission, division occurs repeatedly.
3	Example : Amoeba, Euglena	Example : Algae, Plasmodium

30.

Myopia	Hypermetropia
It is due to the lengthening of the eye ball.	It is due to the shortening of the eye ball.
With this defect, distant objects cannot be seen clearly.	With this defect, nearly objects cannot be seen clearly.
The focal length of the eye lens is reduced.	The focal length of the eye lens is increased.

The fair point will not be at infinity.	The near point will not be at 25 cm.
The far point has come closer.	The near point has moved further.
The image of distant objects are formed before the retina.	The image of nearby objects are formed behind the retina.
It can be corrected by using concave lens.	It can be corrected by using convex lens.
This defect is known as myopia.	This defect is known as hypermeteropia.

31. ➤ As we know that V = W/Q

➤ Thus, the potential difference between two points is one volt when one joule of work is done to carry a charge of one coulomb between the two points in the electric field.

➤ We need to use VOH meter to measure potential diff.

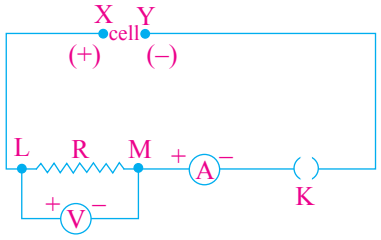
32. ➤ **Ohm's law :** When the physical conditions such as temperature. remain same, the current flowing through the conductor is directly proportional to the potential difference applied across the ends of the conductor, i.e.,

➤ $I \propto V$ or $V \propto I$

➤ $\frac{V}{I}$ = constant

➤ $V = IR$

➤ Where, R is constant of proportionally and is called resistance of the wire.

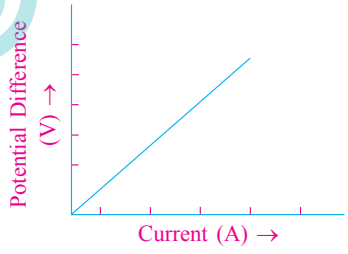


Observation :

➤ 1. Voltmeter and ammeter reading increases as the number > of cells increase in series.

➤ 2. Same value of V/I is obtained in each case.

➤ 3. V-I graph is a straight line passing through the origin of the graph as shown.



33. ➤ 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.

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 series of organisms taking part at various biotic level form the food chain.

➤ Each level of the food chain forms a trophic level.

- The autotrophs or the producers are at the first trophic level. They fix up the solar energy and make it available for heterotrophs or the consumers.
- Herbivores or the primary consumers form the second level.
- Small carnivores or the secondary consumers at the third.
- Larger carnivores or the tertiary consumers form the fourth trophic level.

First Trophic Level	→	Second Trophic Level	→	Third Trophic Level	→	Tertiary Trophic Level
Autotrophs Or Producers		Herbivores or Primary Consumers		Small Carnivores Or Secondary Consumers		Large Carnivores Or Tertiary Consumers

- Different food chains are formed in nature. For example,
- Green plants in forest → Deer → Tiger
- Green plants in grass land → Grass hopper → Frog → Snake → Eagle.
- Green plants in lake → Scorpion → Fish → Duck.

36.

	Atria	Ventricles
i	Atria refer to the two upper chambers of the heart	Ventricles refer to the two lower chambers of the heart
ii	Two types of the right atrium and left atrium	Two types are the right ventricle and left ventricle
iii	Consist of a thin wall	Cosist of a thick wall
iv	Main function is to collect blood and supply it to the ventricels in controlled manner.	Main functions is to push blood throughout the body

37.
- 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.

Section-C

38.
- **(i) Electrolytic Decomposition :**
- Decomposition of substances takes place in the presence of electricity.
- **Example :**
- Add few drops of diluted sulphuric acid and pass the electric current.
- You will get hydrogen and oxygen gas.

$$2H_2O(l) \xrightarrow[\text{current}]{\text{electric}} 2H_2(g) + O_2(g)$$

- **(ii) Photolytic Decomposition :**
- Decomposition of substance takes place in the presence of sunlight.
- **Example :**
- Silver chloride decomposes into silver and chlorine in the presence of sunlight.

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

silver chloride → silver + chlorines

39.
- (i) Why can't we make 24 carat gold jewellery ?
- 24 carat gold is very soft. jewelry made from it changes shape even with a little pressure. Hence he could not make 24 carat gold jewelery.

(ii) Name two metals that can be added in making gold ornaments.

➤ Silver (Ag) (b) Copper (Cu).

➤ (iii) What is the fault of the jeweller in this behaviour ?

The behaviour of the jeweller shows the temptation to make more money by deceiving his customer.

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. ➤ Adrenaline hormone from adrenal medulla secretes during "fight or flight" situation.

➤ The effects of Adrenaline hormone in body :

➤ Increase heart rate, so our muscles get more oxygen supply.

➤ The availability of blood in the digestive tract and skin is reduced, as the muscles of the smell arteries of these organs contract. This directs the blood towards our skeletal muscle.

➤ Contraction of the muscles of the ribs and the ribs increases the respiratory rate.

➤ All these combinations prepare the animal body to fight the situation.

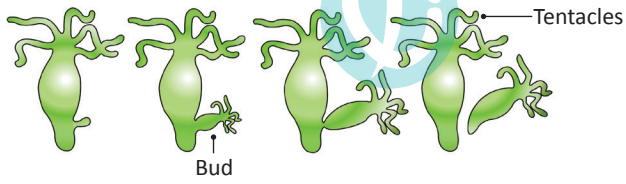
42. A : pollen Tube : Transfer male germ to ovary

B : Ovary : Place of fertilization

C : Ovule : Female germ cell

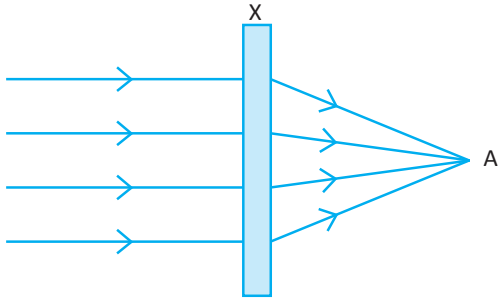
43. ➤ A type of asexual reproduction in which a New individual or branch develops from an outgrowth on the body of a plant or certain lower animals. A form of asexual reproduction in living organisms is in which new individuals form from outgrowths (buds) on the bodies of mature organisms.

➤ **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.

44.



➤ (i) Due to which phenomenon the path of light rays changes ?

➤ The path of the light changes due to refreaction.

➤ (ii) Name the instrument (composition) A.

➤ The instrument X is called convex lens.

➤ **(iii) What is point A ?**

➤ Point A is called centre of the lens.

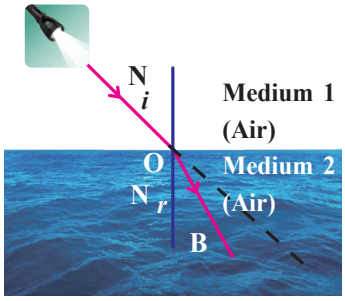
45. ➤ (i) The incident ray, the refracted ray and normal to the interface of two transperant medium at the point of incident, all lie in the same plane.

➤ (ii) The ratio of sine of angle of incidence to the sine of angle of refraction is a constant, for a light of given colour and for the given pair of the media.

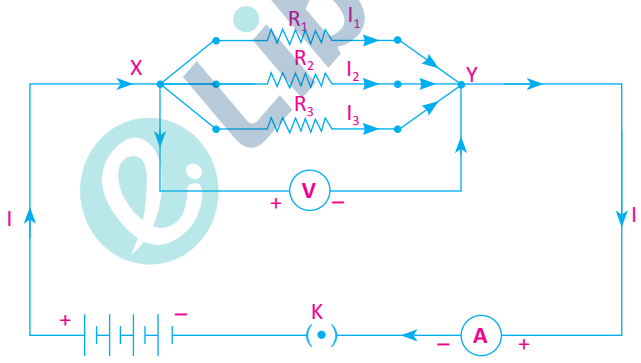
➤ This law is also known as Snell's law of refraction.

➤ This is true for angle $0 < i < 90°$

➤ $\frac{\sin i}{\sin r}$ = constant



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

$$I = \frac{V}{R_p} \quad \text{... ... (2)}$$

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)

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

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

➤ 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. Activity 1 : Conduct an experiment showing that carbon dioxide gas is produced by passing of metal carbonate and metal hydrogen carbonate with acid

➤ Procedure

➤ Take two test tubes, label them as A and B.

➤ Take about 0.5 g of sodium carbonate (Na_2CO_3) in test tube A and about 0.5 g of sodium hydrogen carbonate ($NaHCO_3$) in test tube B.

➤ Add about 2 mL of dilute HCl to both the test tubes.

➤ Reaction during this process can be written as follows.

$$Na_2CO_3(s) + 2HCl(aq) \rightarrow 2NaCl(aq) + H_2O(l) + CO_2(g)$$

$$NaHCO_3(s) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l) + CO_2(g)$$

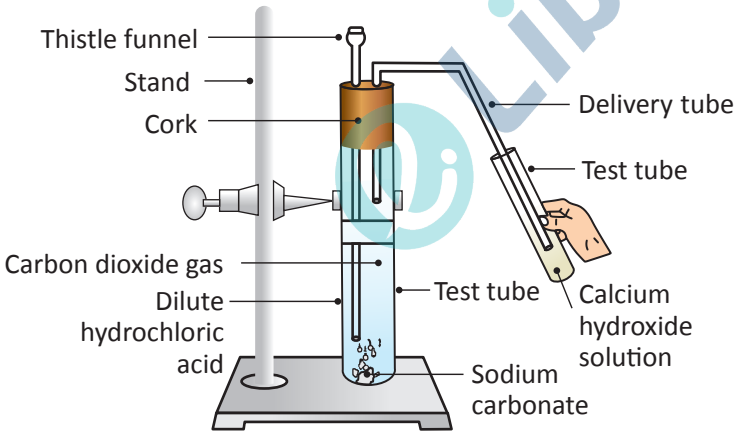
➤ Here the produced CO_2 will be transferred to another test tube filled with Calcium Hydroxide $Ca(OH)_2$ as shown in figure below via delivery tube.

➤ Then we can observe the reaction as follows which is as same as given in observation below :

➤ Observation

➤ As the gas passes through the lime water (calcium hydroxide) to form calcium carbonate the solution become milky in colour, indicating that the gas produced is carbon dioxide.

$Ca(OH)_2(aq)$	+	$CO_2(g)$	$\rightarrow$	$CaCO_3(s)$	+	$H_2O(l)$
Calcium hydroxide		Carbon dioxide		Calcium carbonate		Water



➤ Conclusion

➤ This activity shows that the processing of metal carbonate and metal hydrogen carbonate with acids produces carbon dioxide gas.

➤ In this way it can be confirmed that reaction of acid with metal carbonate and metal hydrogen carbonate gives carbon dioxide CO_2 as a product.

48. pH Value in the digestive system

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

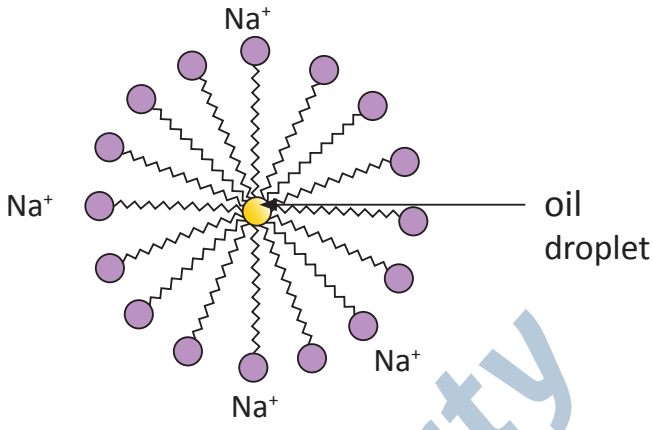
➤ This acid balances the pH value of the stomach.

➤ 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.

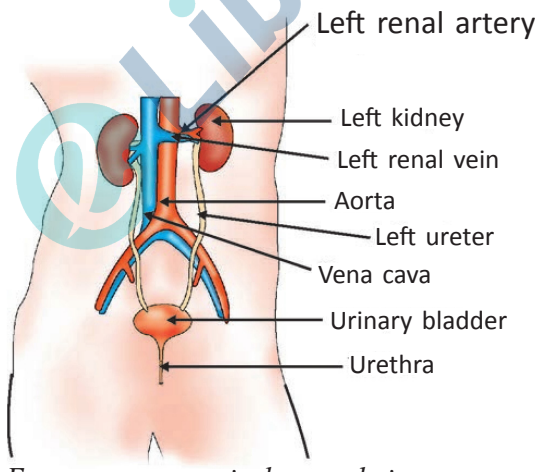
- As a result, our stomach causes pain and irritation.
- Such problems can be cured by consuming basic substances like milk of magnesia which neutralizes the excess acid produced in our stomach.

49. When a dirty cloth is put in water containing dissolved soap, then the hydrocarbon end of the soap molecules in micelle attach to the oil or grease particles present on the surface of dirty cloth. In this way, the soap micelle entraps the oily or greasy particles by using its hydrocarbon ends. The ionic ends of the soap molecules in the micelles, however, remain attached to water. When the dirty cloth is agitated in soap solution, the oily and greasy particles present on its surface and entrapped by soap micelles, get dispersed in water due to which the soap water becomes dirty but the cloth gets cleaned. The cloth is cleaned thoroughly by rinsing in clean water a number of times.



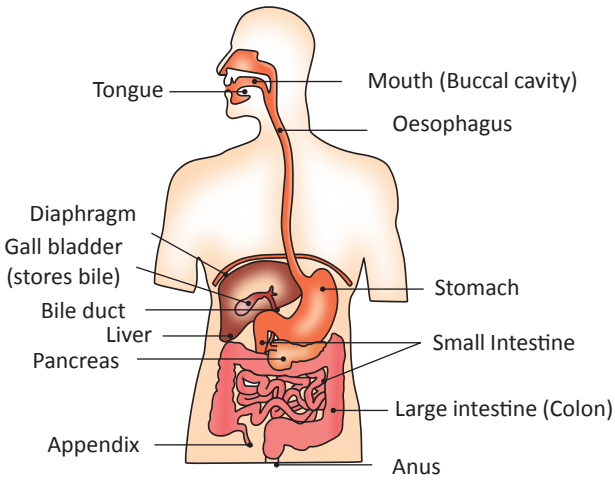
50. The excretions system of human beings includes a pair of kidneys, a pair of ureter, a urinary bladder and a urethra.

- 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

51.



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.

52. It is a kind of defect in human eye which occurs due to ageing. It happens due to the **following reasons :**

(i) decrease in flexibility of eye lens.

(ii) gradual weakening of ciliary muscles.

- In this, a person may suffer from both myopia and hypermetropia.
- **Correction :** By using a bifocal lens with appropriate power. Bifocal lenses consist of both concave and convex lens, upper position consists of the concave lens and lower portion consists of a convex lens.
- **Cataract :** Due to the membrane growth over eye lens, the eye lens becomes hazy or even opaque. This leads to a decrease or loss of vision. This problem is called cataract. It can be corrected only by surgery.

53. **(a) Electric fuse :**

- Electric fuse is a safety device used in electric circuits to protect the circuit and appliances from damage due to overloading and short circuit. It is a wire having high resistance and low melting point. If excess current flows through the circuit, the fuse wire melts and breaks the circuit. Fuse wire is made of a metal or an alloy of metals like lead, tin, aluminium and copper. Fuse wire is connected in series with the live wire.

(b) Overloading :

- Overloading is caused due to increase in voltage, or if the live wire and neutral wire comes in contact or if too many appliances are connected to a single socket. It results in overheating of the wires and can cause damage to the circuit and appliances.

(c) Short circuit :

- Short circuit is caused when the live wire and neutral wire comes in contact and the current suddenly increases in the circuit. It causes spark, fire and damage to the circuit and appliances.

(d) Earthing :

- Earthing is the process of transfering electricity to the ground to protect people from electric 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.
- 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.