

LIBERTY PAPER SET

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

Full Solution

Time : 3 Hours

ASSIGNMENT PAPER 2

Section-A

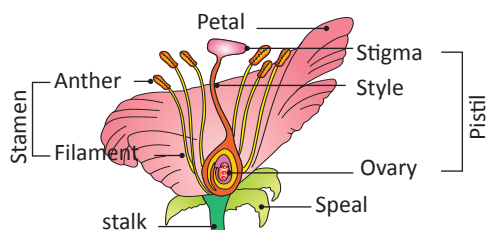
1. (C) Citric acid 2. (B) Conveyance of water 3. (C) Increases greatly 4. (B) Ketones 5. (D) Synapse
 6. (A) 25 cm 7. 3.6×10^6 8. 4 9. Amylase 10. Sexual 11. 10 cm 12. Bromine 13. False 14. True 15.
 True 16. True 17. False 18. Cytokinin 19. 2 min 20. Red 21. $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ 22. A unit cell responsible
 for heredity is called gene. 23. CFC = Chloro Fluoro Carbons 24. (i-c) (ii-a)

Section-B

25. ➤ **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).
26. ➤ To cut off the iron from air (moist).
 ➤ So moist air cannot attack the surface of iron articles.
 ➤ Hence, there is no risk of rusting of iron and they can be protected from damage for many years.
27. ➤ Breast size begins to increase, with darkening of the skin of the nipples at the tips of the breast.
 ➤ Menstruation cycle will start.
- 28.

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, nearby 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.

29. ➤



30. ➤ Absorption of light energy by chlorophyll
 ➤ Conversion of light energy to chemical energy and splitting of water molecule into hydrogen and Oxygen.
 ➤ Reduction of carbon-dioxide to carbohydr

31. $V = 10 \text{ V}$ $Q = 2\text{C}$

We have $V = \frac{W}{Q}$

∴ $W = VQ$

$= 10 \times 2$

$W = 20\text{J}$

20 Joule work is must to move 2C charge at 10V.

32. **Trophic Levels :**

- The various steps in a food chain at which the transfer of food (or energy) takes place are called trophic levels.

Example : A food chain operating in a grassland is given below :

- Grass → Insects → Frogs → Birds

In this food chain

- a. Grass represents first trophic level.
 b. Grasshopper represents second trophic level.
 c. Frog represents third trophic level.
 d. Eagle represents fourth trophic level.

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. $V \propto I$

Or, $\frac{V}{I} = R$ (Constant)

Where, R is the resistance of the given metallia wire at a given temperature.

Thus, $R = \frac{V}{I} = \frac{\text{Volt}}{\text{Ampere}} = V/A = \text{ohm} = \Omega$



The unit of resistance is ohm (Ω)

35. ➤ 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.

36. ➤ **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.

37.

Sr. No.	Components	Symbols
1.	Electric bulb	 or 
2.	A resistor of resistance R	

Section-C

38. ➤ (i) **Mineral** : The natural materials in which metals or their compounds are found in earth are called minerals.
 ➤ (ii) **Ore** : Those minerals from which the metals can be extracted conveniently and profitably are called ores.
 ➤ (iii) **Gangue** : The unwanted impurities like sand, rocky material, earth particles, lime stone, mica, etc in an ore are called gangue.
39. ➤ In a combination reaction, two or more substances combine to form a single product. Also a large amount of heat is evolved.
 ➤ The decomposition reaction requires energy either in the form of heat, light or electricity for breaking down one substance into two or more substances.

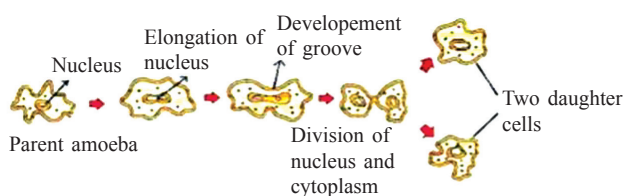


40.

	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 shiny surface.	Non-metals do not have a shiny 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)	Metals 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.

41. Name of asexual reproduction methods are given below.

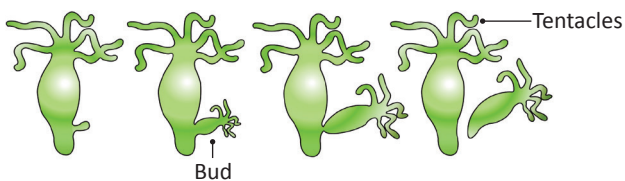
- (i) Fission (ii) Budding (iii) Fragmentation (iv) Regeneration (v) Spore formation (vi) Vegetative propagation (vii) Propagation by tissue culture.
- For unicellular organisms, cell division, or fission, leads to the creation of new individuals. Many different patterns of fission have been observed. 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.

42. Methods of Contraception

Mechanical barriers :

- 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.

Chemical barrier :

- In this method a woman uses two kinds of pills oral and vaginal pills. The oral pills are hormonal preparations which suppress the release of ovum in fallopian tube.
- These are called oral contraceptives.
- The vaginal pills/creams are spermicidal. The chemical in these spermicidal kills the sperms during their journey in the vaginal tract.

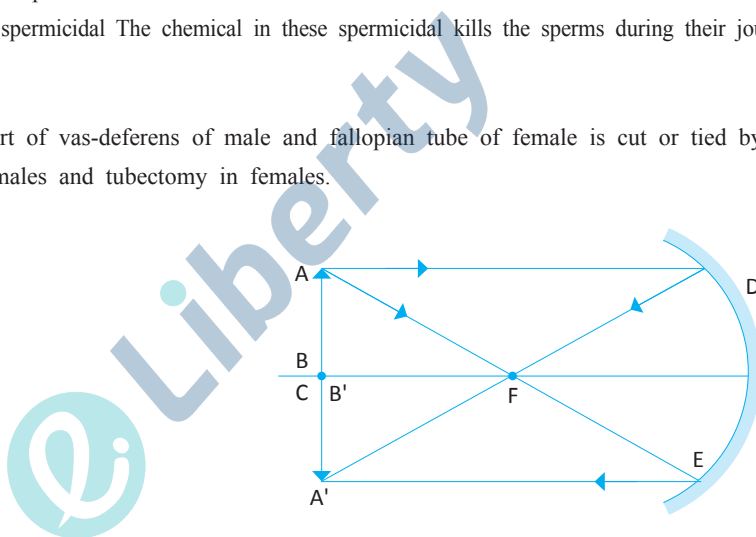
Surgical method :

- In this method, a small part of vas-deferens of male and fallopian tube of female is cut or tied by surgery.
- It is called vasectomy in males and tubectomy in females.

43. C. Position of Object : At C

Properties of Image :

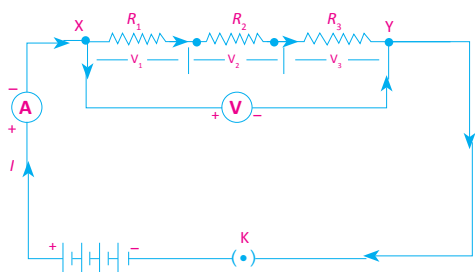
- Position : At C
- Size : Same size as Object
- Nature: Real and Inverted



44. Power of lens : The reciprocal of focal-length of the lens is known as power of lens (P)

- Power of lens $P = \frac{1}{f}$
- SI unit of power of lens is Diopter (D)
- The instrument used to measure power of lens is known as Dioptrometer.

45. 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.

$$V = V_1 + V_2 + V_3 \quad \dots \dots (1)$$

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

Applying the Ohms law to the entire circuit.

$$V = IR_s \quad \dots \dots (2)$$

Applying the Ohm's law for all resistors

(R_1 , R_2 and R_3)

$$V_1 = IR_1, V_2 = IR_2 \text{ and } V_3 = IR_3 \quad \dots \dots (3)$$

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

$$IR_s = IR_1 + IR_2 + IR_3$$

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

➤ 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.

46. Reflex-action : Reflex-action is a simple and rapid response of the nervous system that is unaware of the voluntary centers of the brain.

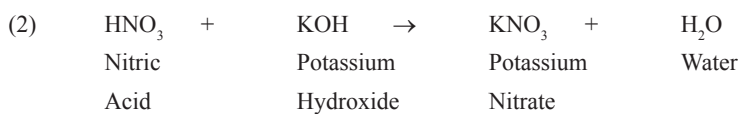
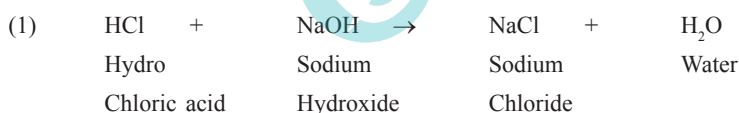
- Example of reflex-action :
- Sudden jerky withdrawal of hand or leg when pricked by a pin.
- Coughing or sneezing
- Knees jerk in response to a blow.
- The sudden removal of the hand from a sharp object.
- Sudden blinking when an insect comes very near to the eyes.

Involuntary Action	Reflex Action
1. They involve autonomic nervous system.	1. They involve all parts of voluntary nervous system.
2. They usually occur in response to internal stimuli.	2. They operate against harmful stimuli which are generally external and may cause injury.

Section-D

47. (a) The process of chemical reaction between acids and bases to form salts and water is called neutralization.

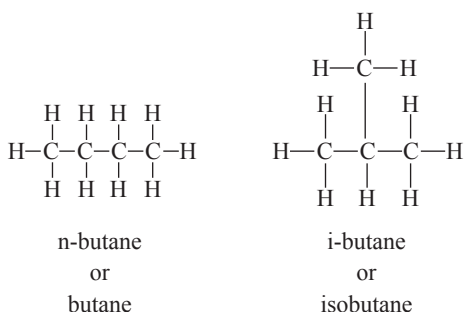
➤ **Example :**



Ex. Vanilla, onion and clove, used as olfactory indicators.

(b) Indicator which indicates nature by changing its colour or smell are termed as olfactory indicators.

48. (a)



- (b) > Hydrogen and carbon containing compounds known as Hydrogen compounds.
- > Classification of hydrocarbon compounds is as follows :

Hydrocarbon Compounds		
Saturated hydrocarbon compounds	Unsaturated hydrocarbon compound	
Alkanes	Alkines	Alkines
General Formula : $C_n H_{2n+2}$	General Formula : $C_n H_{2n}$	General Formula : $C_n H_{2n-2}$
Hydrocarbon compounds that have a single bond between a carbon-carbon atom are called Alkane compounds.	Hydrogen compound that have one or more doable bond between carbon-carbon atom is called Alkines compounds.	Hydrocarbon compounds that have one or more triple-bond between carbon-carbon atom are called Alkine compounds.
Example : Methane, Ethane, Propane, Butane, Pentane etc.	Example : Ethene, Propin	Example : Ethyne, Propyne

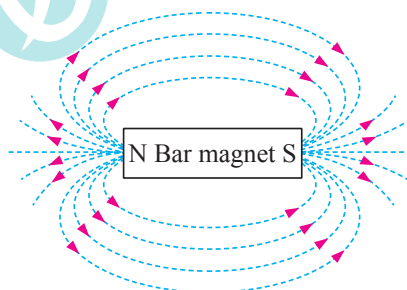
49. > In kitchen my mom uses baking soda to make crispy pakoda or cakes.
- > Its chemical formula is $NaHCO_3$
- Formation of baking soda :**
- > When we pass carbon dioxide and ammonia gas through aqueous sodium chloride we get baking soda.
- $$NaCl + H_2O + CO_2 + NH_3 \rightarrow NH_4Cl + NaHCO_3$$
- sodium
hydrogen
carbonate

50. Uses : Baking in Kitchen, Soda Acid Fire Extinguisher, In Antacids

- > The lines drawn around the magnetic field of any magnet are known as magnetic field lines which are also used to determine the direction of the magnetic field.

Properties of magnetic lines of force :

- > Outside the magnet the field lines originate from north pole and end at the south pole.
- > The magnetic field lines are continuous closed loops.



> **Properties of magnetic lines of force :**

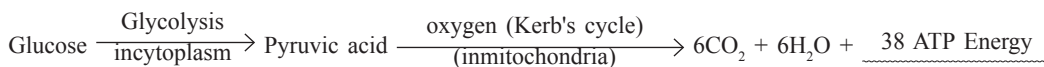
- > Field lines arise from North Pole and end into South Pole of the magnet.
- > Field lines form circular loop.
- > Field lines are closer in stronger magnetic field.
- > Field lines never intersect each other as for two lines to intersect; there must be two North directions at a point, which is not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

51. Process of Breakdown of Glucose to get energy to complete diff. process in Human body is termed as Respiration. Name of the some organisms that use anaerobic mode of respiration are yeast, E.coli, lactic acid bacteria.

- > Types of Respiration
- > Respiration is of two types, aerobic and anaerobic.

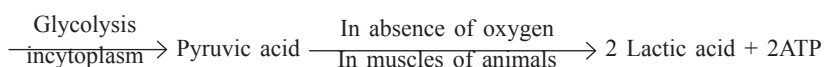
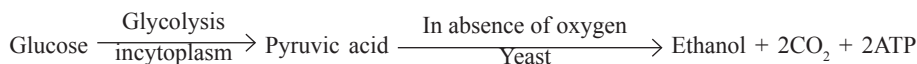
Aerobic respiration :

- The respiration which takes place in the presence of oxygen is called aerobic respiration.
- Aerobic respiration takes place in the cell, so it is also called cellular respiration.
- During this food (Glucose) is broken down into carbon dioxide and water in the presence of oxygen.
- The energy released in the process is stored in ATP.
- The overall equation can be represented as follows :

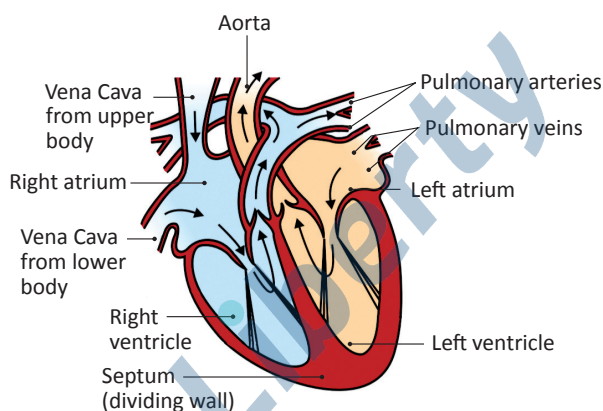


Anaerobic Respiration :

- The respiration which takes place without oxygen is called anaerobic respiration.
- It is seen in microorganisms like bacteria, yeast, fungi, and parasites and muscle cells.
- In anaerobic respiration, the microorganisms breakdown glucose into ethanol and carbon dioxide and release energy.
- CO₂ and ethanol are formed as end products in plants, while lactic acid is an end product in muscles of animals.



52. ➤ HEART : (Our pump)



Schematic sectional view of the human heart

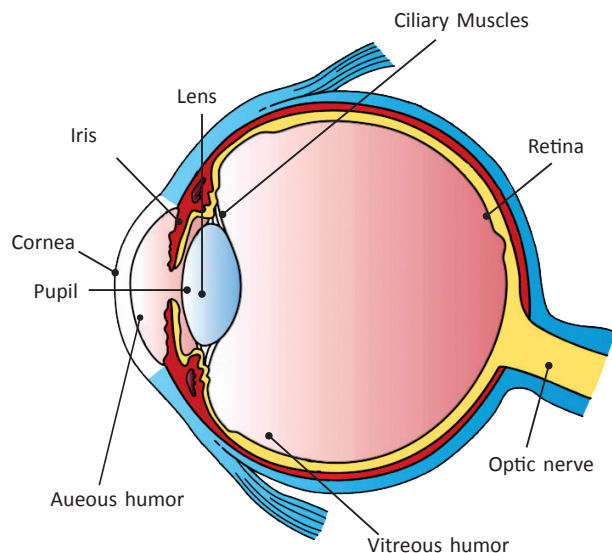
➤ Structure :

- The human heart is conical in shape and is of the size of a closed fist.
- It is located in the small space between two lungs and slightly towards the left side.
- As both carbon dioxide and oxygen are transported by blood, the heart is four-chambered in order to prevent the mixing of oxygen-rich blood with the blood containing carbon dioxide.
- The upper two chambers are called atria (singular - atrium). Of these one is the left atrium and the other is the right atrium.
- The two lower chambers are known as ventricles, of these one is the left ventricle and the other is the right ventricle.
- The walls of atria are thin, while the walls of ventricles are thick.
- All the four chambers are separated from each other by partitions called septa.
- For the flow of blood from the left atrium to the left ventricle, there is a bicuspid valve.
- Similarly, there is a tricuspid valve between the right atrium and right ventricle. These valves prevent backward flow of the blood from ventricles to atria.

➤ Functions :

- The heart plays a key role in the circulation of blood and maintaining the mechanism of the whole body. It is the most vital organ of the human body.
- The heart performs the following important functions :
- The primary function of the heart is to pump blood throughout the body.
- It supplies oxygen and nutrients to the tissues and removes carbon dioxide and wastes from the blood.
- It also helps to maintain adequate blood pressure throughout the body.

53.



- The three main parts of a human eye are retina, cornea, eye lens, pupil, ciliary muscles and iris.
- **(i) Eye-lens** : It provides the finer adjustment of focal-length required to focus objects at different distance on the retina.
- **(ii) Iris** : It controls the size of the pupil.
- **(iii) Ciliary Muscles** : It modify the shape of the eye-lens which leads to the variation in focal-lengths.

- 54.
- 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 is 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.

