LIBERTY PAPER SET

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

Full Solution

Time : 3 Hours **ASSIGNTMENT PAPER 10**

Section-A

1. (B) (i) And (iii) **2.** (A) CH_3 $COCH_3$ **3.** (C) Emissions **4.** (B) IR^2 **5.** (D) Clay **6.** (D) Retina **7.** 290 **8.** 23 **9.** Plasma **10.** Amoeba **11.** convex **12.** Lead and Tin **13.** True **14.** False **15.** False **16.** True **17.** Central Nervous System **18.** Sex Determination **19.** Issac Newton **20.** Rheostat **21.** (b) Regulates metabolism for body growth. **22.** (a) Regulates the amount of sugar in the blood. **23.** (a) Self sustaining **24.** (b) Primary consumers

Section-B

25. ➤ 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 subtances.

$N_2 + 3H_2 \rightarrow 2NH_3$ + Heat (Combination)

$2NH_3$ + Heat $\rightarrow N_2 + 3H_2$ (Decomposition)

26. ➤ **The common properties of metals are listed below:**

(i) Metals in their pure state, have a shining surface.
(ii) They are hard and solid in nature.
(iii) They have characteristic of ductility.
(iv) They have characteristic of malleability.
(v) Metals are good conductors of electricity and heat.
(vi) Metals have high melting point.
(vii) Metals produce ringing sound.

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. ➤ 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.

➤ **Chemical barrier :**

➤ In this method a woman uses two kinds of pills oral and vaginal pills. The oral pills are hormonal preparations which supress 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.

29. ➤ The various changes occuring in girls at puberty are :

➤ Hair grows under armpits and pubic region.

➤ Mammary glands (or breasts) develop and enlarge.

➤ The hips broaden.

➤ Extra fat is deposited in various parts of the body like hips and thighs.

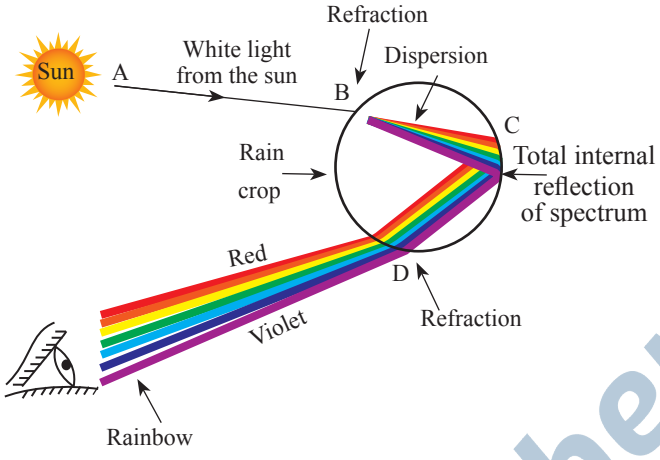
➤ Fallopian tube, uterus and vagina enlarge.

➤ Ovaries start to release eggs.

➤ Menstruation (monthly periods) starts.

➤ Feelings and sexual drives associated with adulthood begin to develop.

30.



➤ **Formation of the rainbow:**

➤ Light rays reach the drop near its top level. At first, there is refraction, then the dispersion of white light into colours of a different wavelength.

➤ Violet is the most deviated and red is the least deviated colour.

➤ Reaching the opposite side of the drop, each colour is refracted back into the drop due to complete internal reflection that hits the drop surface.

➤ Every colour is refracted to the air again.

➤ We experience the rainbow when we observe in between 42-40 degrees.

31. ➤ V = 220 V, J = 0.50 A

➤ P = VI

$= 220 \text{ V} \times 0.50$

$= 220 \times \frac{50}{100}$

$= 22 \times 5 = 110 \text{ W}$

$P = 110 \text{ W}$

32. ➤ Unit of current is ampere. If one coulomb of charge flows through any section of a conductor in one second, then the current through it is said to be one ampere.

$I = Q/t$ or $1 \text{ A} = 1 \text{ C s}^{-1}$

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.

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.
- 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.

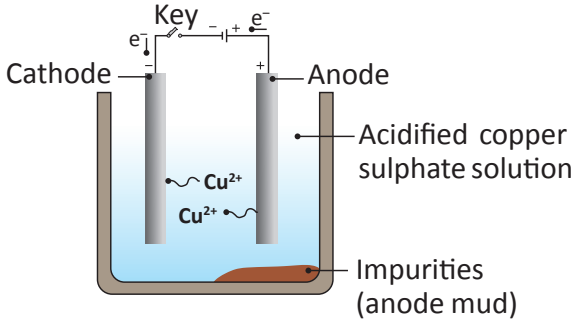
36. A = Pyruvate
B = In yeast
C = Lactic Acid
D = Water

37.
- (i) The wires used in the circuit must be coated with good insulating materials like PVC, etc.
- (ii) The circuit must be divided into different sections and a safety fuse must be used in each section.
- (iii) High power appliances like air-conditioner, refrigerator, a water heater, etc. should not be used simultaneously.

Section-C

38.
- **(i) Oxidation Reaction :**
- The chemical reaction in which a substance gains oxygen or loses hydrogen that reaction is known as oxidation reactivity.
- **Example :**
  $2Cu(s) + O_2(g) \rightarrow 2CuO(s)$
- Here, copper gains oxygen(O), so it is called oxidised.
- **(ii) Reduction Reaction :**
- The chemical reaction in which a substance loses oxygen or gains hydrogen is known as reduction reaction.
- **Example :**
  $CuO(s) + H_2(g) \rightarrow Cu(s) + H_2O(l)$
- Here, copper oxide (CuO) loses oxygen (O) so it is said to be reduced.

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. ➤ Some of the causes are as follows :

➤ Metal corrodes when it reacts with another substance such as oxygen, hydrogen, an electrical current or even dirt and bacteria.

➤ Corrosion can also happen when metals like steel are placed under too much stress causing the material to crack.

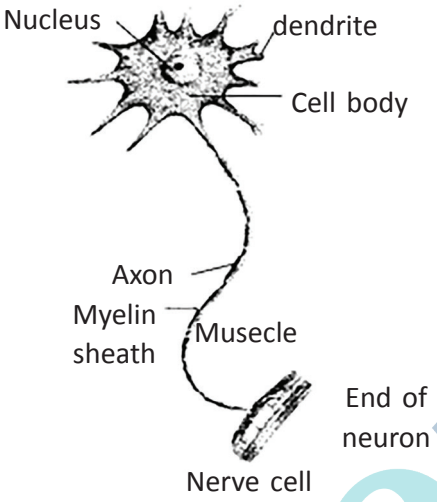
➤ Silver articles become black after sometime when exposed to air. This is because it they react with sulphur in the air to form a coating of silver suphide.

➤ Copper reacts with moist carbon dioxide in the air and slowly loses its shiny brown surface and gains a green coat. This green substance is basic copper-carbonate

➤ The Methods to prevent corrosion are as follows :

1. Alloying 2. Galvanization 3. Electroplating 4. Painting and greasing. 5. Oiling 6. Anodification

41.



➤ Nerve cell or neuron is the functional unit of nervous system. A nerve cell has three parts-

➤ (i) cell body (ii) dendrite (iii) axon

➤ **Function :** The function of nerve cells is to carry information in the form of electrical signals which are called nerve impulses. Cells receive stimulus to send it to spinal cord and brain and carry the message from brain to the target organ.

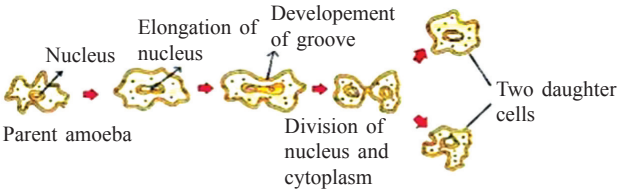
42. ➤ Name of asexual reproduction methods are given below.

➤ (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.

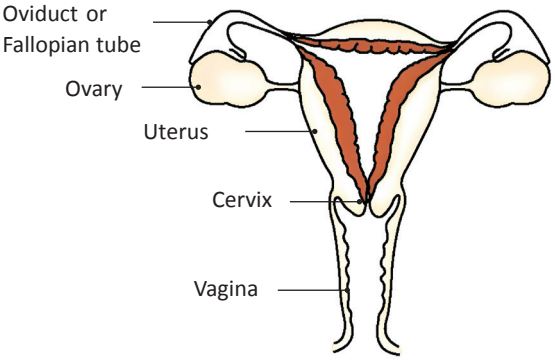
➤ The single-celled organisms, such as the malaria parasite, plasmodium, divide into many daughter cells simultaneously by multiple fission. Yeast, on the other hand, can put out small buds that separate and grow further.

➤ **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.

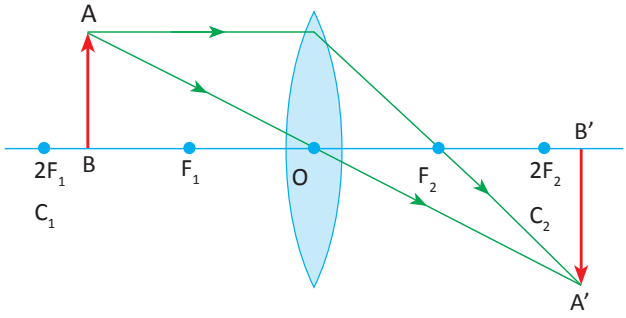
44. ➤ **D. Position of Object : Between F_1 and $2F_1$**

Properties of Image :

Position : Beyond $2F_2$

Nature : Real and Inverted

Size : Enlarged



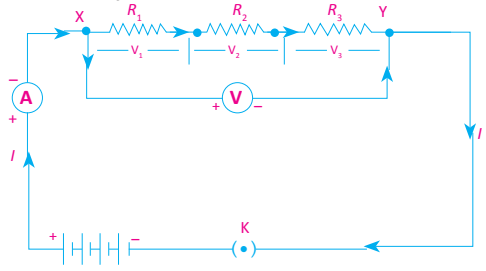
45. ➤ **Power of lens :** The reciprocal of focal-length of the lens is known as power of lens (P)

➤ 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 Dioptermeter.

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.

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 $Ca(OH)_2 \rightarrow Ca(OH)_2 + Cl_2 \rightarrow CaoCl_2 + H_2O$
- ➤ **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.
- ➤ It is a strong oxidizing agent, hence used as an oxidizer in many industries.
- ➤ It is used as a disinfectant for disinfecting water to make potable water.

48. 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.

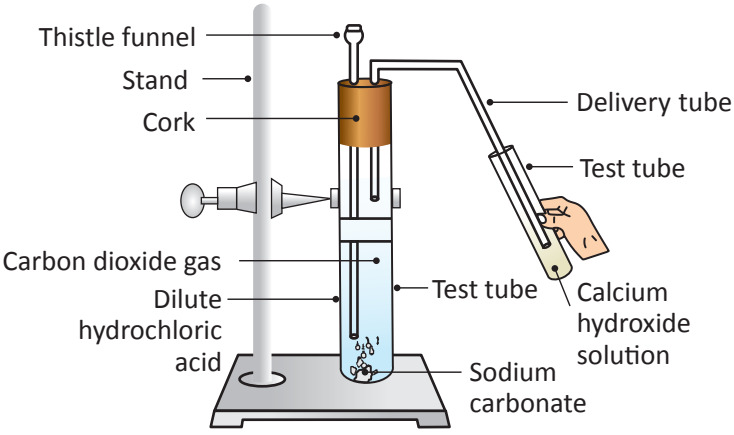
$$Na_2CO_3(s) + 2HCl(aq) \rightarrow 2NaCl(aq) + H_2O(l) + CO_2(g)$$

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

- ➤ 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.

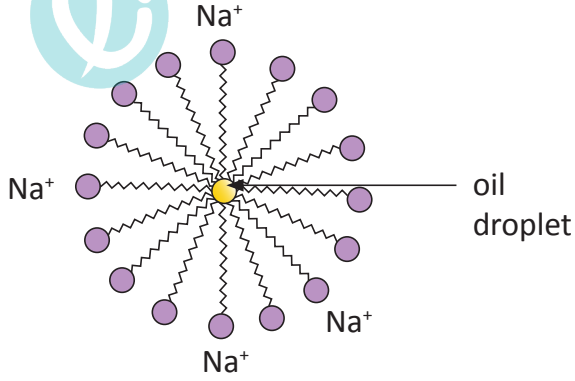
- Then we can observe the reaction as follows which is as same as given in observation below :
- Observation
- As the gas passes through the lime water (calcium hydroxide) to form calcium carbonate the solution become milky in colour, indicating that the gas produced is carbon dioxide.

$Ca(OH)_2(aq)$	+	$CO_2(g)$	→	$CaCO_3(s)$	+	$H_2O(l)$
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.

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.



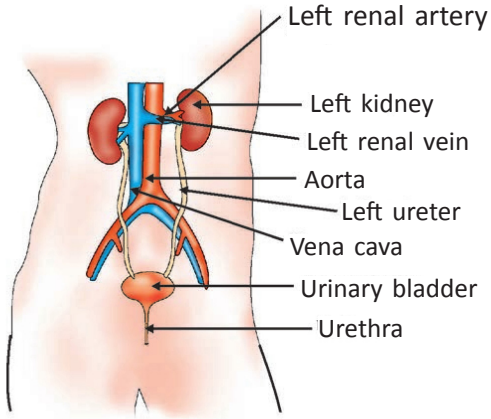
50. A) Figure shows digestive system in Humans

B) Stomach : HCL secretion

C) Small Intestine has villies init

D) Gall Bladder : Stores Bile Juice

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. ➤ The child is suffering from myopia.

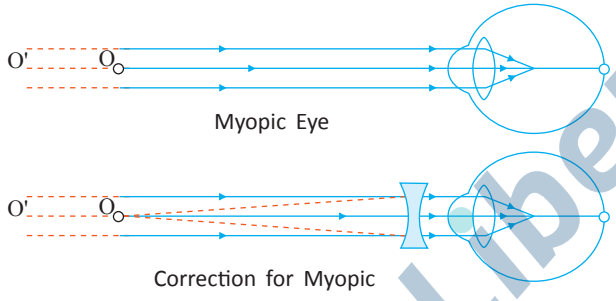
➤ This defect may arise due to

➤ (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.

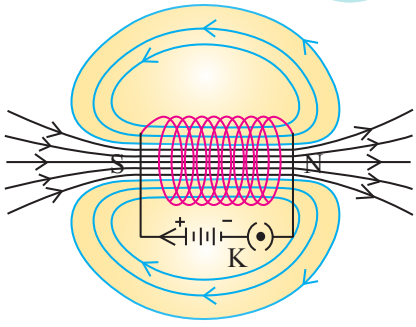
➤ A concave lens of suitable power will bring the image back on to the retina and thus the defect is corrected.



53. ➤ **Solenoid :**

➤ Solenoids are cylinders formed by many circular loops wrapped very close to a separated copper wire.

➤ The pattern of magnetic field lines formed due to electric current solenoid is shown in the figure.



➤ It is clear from the figure that the magnetic field of a solenoid is similar to that of a magnetic field of bar magnet.

➤ Thus, one end of the solenoid acts as a magnetic north pole and the other end as a magnetic south pole.

➤ The magnetic field lines in the area inside the solenoid are parallel lines.

➤ That is the magnetic field in the area inside the solenoid is the same.

➤ The magnetic field of a solenoid is strengthened by placing an iron-like metal inside the area.

➤ A magnet formed in this way is called an electromagnet.

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.