Class-X Session 2022-23
Subject - Science (086)
Sample Question Paper - 37
With Solution

# BLUE PRINT

| S. No. | Chapter Name | Section-A (MCQs & A/R) 1 Mark | Section-B (VSAQs) 2 Marks | Section-C (SAQs) 3 Marks | Section-D (LAQs) 5 Marks | Section-E (Case Study) 4 Marks | Total Marks |
|---|---|---|---|---|---|---|---|
| | | Q. No. | Q. No. | Q. No. | Q. No. | Q. No. | |
| 1 | Chemical Reactions and Equations | 3(Q1,6,7) | 1(Q21 OR) | 1(Q27) | | | 6 |
| 2 | Acids, Bases and Salts | 1(Q2) | | | 1(Q34) | | 6 |
| 3 | Metals and Non-metals | 2(Q3,17) | 1(Q21) | | | 1(Q37) | 8 |
| 4 | Carbon and its Compounds | 2(Q4,5) | | 1(Q28) | | | 5 |
| 5 | Life Processes | 1(Q20) | 1(Q22) | | | 1(Q38) | 7 |
| 6 | Control and Co-ordination | 1(Q16) | 1(Q25) | 1(Q33) | | | 6 |
| 7 | How do Organism Reproduce | 2(Q13,18) | | | 1(Q36) | | 7 |
| 8 | Heredity and Evolution | 1(Q14) | 2(Q23,26) | | | | 5 |
| 9 | Light- Reflection and Refraction | | | 1(Q29) | | 1(Q39) | 7 |
| 10 | Human Eye and Colourful World | 3(Q8,10,19) | 1(Q24) | | | | 5 |
| 11 | Electricity | 1(Q11) | | 2(Q30,32) | | | 7 |
| 12 | Magnetic Effects of Electric Current | 1(Q15) | | | 1(Q35) | | 6 |
| 13 | Our Environment | 2(9,12) | | 1(Q31) | | | 5 |
| | * Total Questions (Total Marks) | 20(20) | 6(12) | 7(21) | 3(15) | 3(12) | 80 |

* The number given outside the bracket denotes number of questions asked in the sample paper, while the number given inside the bracket denotes marks.

**Time Allowed : 3 Hours** **Max. Marks : 80**

## General Instructions

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
3. **Section A** consists of 20 objective type questions carrying 1 mark each.
4. **Section B** consists of 6 Very Short Answer type questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.
5. **Section C** consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words
6. **Section D** consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
7. **Section E** consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

## SECTION-A

**Select and write one most appropriate option out of the four options given for each of the Questions 1 to 20**

**1.** Which of the following statements is incorrect?

(a) A chemical equation tells us about the substances involved in a reaction.

(b) A chemical equation informs us about the symbols and formula of substances involved in a reaction.

(c) A chemical equation tells us about the atom or molecules of the reactants and products involved in a reaction.

(d) A chemical equation does not represents energy changes during a reaction.

**2.** Common salt besides being used in kitchen can also be used as the raw material for making

(i) washing soda (ii) bleaching powder

(iii) baking soda (iv) slaked lime

(a) (i) and (ii) (b) (i), (ii) and (iv)

(c) (i), (ii) and (iii) (d) (i), (iii) and (iv)

**3.** An element A is soft and can be cut with a knife. This is very reactive to air and cannot be kept open in air. It reacts vigorously with water. Identify the element from the following

(a) Mg (b) Na

(c) P (d) Ca

**4.** Which of the following are isomers?

(a) Butane and isobutene (b) Ethane and ethene

(c) Propane and propyne (d) Butane and isobutane

**5.** Which of the following statements is not correct?

(a) Graphite is much less dense than diamond (b) Graphite is black and soft

(c) Graphite has low melting point (d) Graphite feels smooth and slippery

**6.** A student added dilute HCl to a test tube containing zinc granules and made following observations which one is correct?

(a) The zinc surface became dull and black.

(b) A gas evolved which burns with a pop sound.

(c) The solution remained colourless.

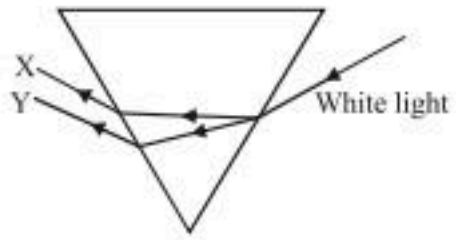
(d) The solution becomes green in colour.

**7.** Electrolysis of water is a decomposition reaction. The mole ratio of hydrogen and oxygen gases liberated during electrolysis of water is

(a) 1 : 1 (b) 2 : 1

(c) 4 : 1 (d) 1 : 2

**8.** In the diagram given below, X and Y are the end colours of the spectrum of white light. The colour of 'Y' represents the




(a) Colour of sky as seen from earth during the day.
(b) Colour of the sky as seen from the moon.
(c) Colour used to paint the danger signals.
(d) Colour of sun at the time of noon.

**9.** Which of the following is an result of biological magnification:
(a) Top level predators may be harmed by toxic chemicals in environment.
(b) Increase in carbon dioxide
(c) The green-house effect will be most significance at the poles
(d) Energy is lost at each trophic level of a food chain

**10.** The sky appears dark to passengers flying at very high altitudes mainly because :
(a) Scatterings of light is not enough at such heights.
(b) There is no atmosphere at great heights.
(c) The size of molecules is smaller than the wavelength of visible light.
(d) The light gets scattered towards the earth.

**11.** What should be the characteristic of fuse wire?
(a) High melting point, high specific resistance
(b) Low melting point, low specific resistance
(c) High melting point, low specific resistance
(d) Low melting point, high specific resistance

**12.** UV rays cause cancer but in stratosphere the same UV rays are helping us, how?
(a) They divert harmful UV rays back to sun.
(b) They convert oxygen in stratosphere into ozone.
(c) UV rays are not present in stratosphere.
(d) UV rays reach the earth surface then bounce back carrying ozone to stratosphere.

**13.** What is not common among these between sperm and ova?
(a) Both have nucleus
(b) Both are produced in germ cells
(c) Both have 21 chromosomes
(d) Both have mitochondria

**14.** Sex determination in humans is due to the presence of:
(a) Presence of X-chromosome in female
(b) Presence of only Y-chromosome in male
(c) Formation of two types of eggs by female
(d) Formation of two types of spems by male

**15.** At the time of short circuit, the current in the circuit
(a) reduces substantially.
(b) does not change.
(c) increases heavily.
(d) very continuously.

**16.** Parasympathetic nervous system increases the activity of:
(a) Gut, iris and urinary bladder
(b) Heart, adrenal and sweat gland
(c) Heart, pancreas and lachrymal gland
(d) Lachrymal gland and sweat gland

**Directions: Q.No. 17–20 are Assertion - Reasoning based questions:** These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true and R is not the correct explanation of A

(c) A is true but R is false

(d) A is False but R is true

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**17.** **Assertion:** Electric wires are made up of copper.

**Reason:** Non-metals are bad conductor of electricity.

**18.** **Assertion:** Male urethra is also called urinogenital duct.

**Reason:** The male urethra carrier urine and sperms.

**19.** **Assertion:** When a ray of light passes through a prism, it bends towards the thicker part of the prism.

**Reason:** An incident ray strikes a prism, undergoes refraction and comes out as an emergent ray.

**20.** **Assertion:** Glomerulus acts as a dialysis bag.

**Reason:** Bowman's capsule is found in heart.

## SECTION-B

**Q. no. 21 to 26 are Very Short Answer Questions.**

**21.** What is metallic lustre?

**OR**

What is the role of oxidation to reduction reaction in living creatures?

**22.** Name the main organs of the human digestive system in the order they participate in the process of digestion. Describe how digestion of carbohydrates take place in our body.

**OR**

(a) Where does digestion of fat take place in our body?

(b) How is small intestine designed to absorb digested food?

**23.** How do Mendel's experiments show that traits may be dominant or recessive ?

**24.** A man who wears glasses of power 3 dioptre must hold a newspaper at least 25 cm away to see the print clearly. How far away would the newspaper have to be if he took off the glasses and still wanted clear vision?

**OR**

How can we determine the focal length and power of the concave lens required to correct a myopic eye?

**25.** Define neuron. Name the parts of neuron where:

(i) Information is acquired.

(ii) Impulse must be converted into chemical signal for onwards transmission.

**26.** If a trait A exists in 10% of a population of an asexually reproducing species and a trait B exists in 60% of the same population, which trait is likely to have arisen earlier ?

## SECTION-C

**Q.no. 27 to 33 are Short Answer Questions.**

**27.** Give one example of each with their chemical and molecular formulae:

(a) Carbonate salt

(b) Chloride salt

(c) Copper salt

(d) Sodium salt

(e) Nitrate salt

(f) Sulphate salt

**28.** (a) Ethane, Ethene, Ethanoic acid, Ethyne, Ethanol

From the list of compound given above, name:

(i) The compound with – OH as a part of its structure.

(ii) The compound with – COOH as a part of its structure.

(iii) Homologues and Homologous series with general formula $C_nH_{2n}$.

(b) Write the IUPAC names of the following:

(i) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - COOH$

(ii) $CH_3COOCH_2CH_3$

(iii) $CH_3CH_2 - \underset{\displaystyle OH}{\underset{|}{CH}} - CH_2OH$

**29.** If the image formed by a lens for all position of an object placed in front of it is always erect and diminished, what is the nature of this lens? Draw a ray diagram to justify your answer. It the numerical value of the power of this lens of 10 D, what is its focal length in the Cartesian system?

**30.** (i) Establish the relation between kilowatt-hour and joules.

(ii) A 2000 W of electric geyser is used every day for 1 hour. How many units of electrical energy will it consume in 30 days?

**31.** What is the reason that a food chain consists of only 3-5 steps?

**32.** State the factors on which resistance of a conductor depends.

**OR**

A torch bulb is rated 5V and 500 mA. Calculate its (i) power, (ii) resistance, (iii) energy consumed when it is lighted for 4 hours.

**33.** (a) Write the names and more one function of each of three growth hormones in plants.

(b) In the absence of muscle cells, how do plant cells show movement?

## SECTION-D

**Q.no. 34 to 36 are Long Answer Questions.**

**34.** (a) A metal carbonate *X* on reacting with an acid gives a gas which when passed through a solution *Y* gives the carbonate back. On the other hand, a gas *G* that is obtained at anode during electrolysis of brine is passed on dry *Y*, it gives a compound *Z*, used for disinfecting drinking water. Identity *X*, *Y*, *G* and *Z*.

(b) Write the chemical formula of plaster of paris.

**OR**

(a) What will be the action of the following substances on litmus paper?
Dry HCl gas, moistened $NH_3$ gas, lemon juice, carbonated soft drink, curd, soap solution.

(b) A milkman adds a very small amount of baking soda to fresh milk.

(i) Why does he shift the pH of the fresh milk from 6 to slightly alkaline?

(ii) Why does this milk take a long time to set as curd?

**35.** What are magnetic field lines? List three characteristics of these lines. Describe in brief an activity to study the magnetic field lines due to a current flowing in a circular coil.

**36.** (i) Name the organ that produces sperms as well a secretes a hormone in human males. Name the hormone it secretes and write its functions.

(ii) Name the parts of the human female reproductive system where fertilisation occurs.

(ii) Explain how the developing embryo gets nourishment inside the mother's body.

## SECTION-E

**Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.**

**37.** Read the following case/passage and answer the questions.

The huge annual loss due to corrosion is a national waste and should be minimized.

Following are some methods which are helpful to prevent corrosion

(i) Coating the iron surface with paint or oil or grease prevents moist oxygen from coming in contact with the metal and thus effectively prevents rusting of iron.

(ii) Galvanisation : Iron is blasted with fine sand to make the surface rough dipped in molten zinc and then cooled. A thin layer of zinc forms on the iron surface. Since zinc is more reactive than iron, it acts as a sacrificial metal and is preferentially oxidised thus preventing oxidation of iron.

(iii) Electroplating with tin, nickel or chromium also prevents rusting.

(iv) Alloying (mixing iron in its molten state with other metals) prevents rusting. Stainless steel is an alloy of iron with Cr or Ni.

(a) What is corrosion ?

(b) How do we present corrosion ?

**OR**

(b) (i) How do we protect the bottom of ship made of iron ?

(ii) What is the most durable metal plating on iron to protect against corrosion ?

**38.** Read the following case/passage and answer the questions.

A star-shaped figure was cut in the black paper strip used for covering the leaf of a destarched plant used for demonstrating that light is necessary for photosynthesis. At the end of the experiment when the leaf was tested for starch with iodine, the star shaped figure on the leaf was found to be blue-black in colour.

(i) When iodine was added to a particular vegetable, which has been crushed into a paste, blue-black colour was obtained. What it indicates ?

(ii) Write the combination of relevant materials required for setting up an experiment to show that light is necessary for photosynthesis?

(iii) In order to destarch the leaves for an experiment to show that sunlight is necessary for photosynthesis, the _____.

(iv) In the experiment to prove that light is necessary for photosynthesis, which substance is required?

**39.** Read the following case/passage and answer the questions.

The bending of the light ray from its path in passing from one medium to the other medium is called refraction of light. If the refracted ray bends towards the normal relative to the incident ray (Passing obliquely), then the second medium is said to be denser than the first medium. But if the refracted ray bends away from the normal, then the second medium is said to be rarer than the first medium. If a ray of light passing normally i.e., at right angles from one medium to another optical medium then it does not bend or deviate from its path. Refraction of light takes place due to change in the speed of light as it enters from one medium to another medium.

(a) Refractive indices of benzene and kerosene oil are 1.5 and 1.4 respectively. Which is optically denser?

(b) What do you understand by optically denser and optically rarer medium?

(c) Explain laws of refraction of light.

**OR**

(c) Light enters from air to glass having refractive index 1.50. What is the speed of light in the glass ? The speed of light in vaccum is $3 \times 10^8$ m / sec.

# Solution

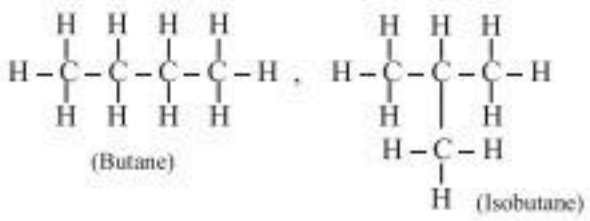
## SAMPLE PAPER-8

**1.** **(d)** A chemical equation represents energy change during a reaction.

**2.** **(c)** Common salt (sodium chloride) is used as a raw material for making a large number of chemicals such as washing soda, baking soda and chlorine gas. Chlorine gas obtained during electrolysis of aqueous NaCl (brine) is used for making bleaching powder.

**3.** **(b)** From the properties of the element given in the question, it is clear that the element is sodium (Na).

**4.** **(d)** Butane and isobutane have same chemical formula but different arrangement of atoms and have different structure.




**5.** **(c)**

**6.** **(b)** $Zn + 2HCl \longrightarrow ZnCl_2 + H_2$

Hydrogen gas burns with a pop sound.

**7.** **(b)** The decomposition of water during electrolysis gives hydrogen and oxygen gases in the ratio 2 : 1 by volume.

$$\underset{\text{Water}}{2H_2O(l)} \xrightarrow{\text{Electric current}} \underset{\text{Hydrogen}}{2H_2(g)} + \underset{\text{Oxygen}}{O_2(g)}$$

**8.** **(c)** The colour of Y is red the colour used to paint the danger signal. When white ray of light passes through a prism it disperses into seven colours VIBGYOR. Red colour deviates or bends the least.

**9.** **(a)** The accumulation of harmful chemicals with an increase in trophical level is known as biological magnification.

**10.** **(a)** Scattering of light is not enough at such heights.

**11.** **(d)** Fuse wire should be such that it melts immediatley when strong current flows through the circuit. The same is possible if its melting point is low and resistivity is high.

**12.** **(a)** Good ozone is found in the upper part of the atmosphere called stratosphere and it acts as a shield absorbing ultraviolet radiation from the Sun.

**13.** **(c)** Both sperm and ova contain 23 chromosomes, total 46 chromosomes.

**14.** **(d)** Sex determination in humans is due to the two types of chromosomes (X & Y) in males.

**15.** **(c)** Increases heavily

**16.** **(a)**

**17.** **(b)** Electric wires are made up of copper metal because metal are good conductor of electricity.

**18.** **(a)** Both Assertion and Reason are correct and the Reason is a correct explanation of Assertion.
The male urethra is lined by pseudostratified epithelium.

**19.** **(b)** When a light ray passes through denser medium from a rarer it undergoes refraction.

**20.** **(c)** Bowman's capsule which is found in kidney, accomodates one glomerulus, and is lined by flat cells. Some of which have fine pores to allow passage of materials filtered out of a glomerulus.

**21.** In pure state, metals have a shining surface. (2 marks)

**OR**

Glucose is oxidised to produce energy used by cells. (2 marks)

**22.** The main organs of human digestive system involved in the process of digestion of food, *i.e.*, starting from mouth in the correct order are as follows:
Mouth → Oesophagus → Stomach → Small intestine (consisting of duodenum, jejunum and ileum) → Large intestine (consisting of caecum, colon and rectum). (1 mark)

- **Digestion of carbohydrate:** Carbohydrate digestion begins in the buccal cavity, as human saliva contains an enzyme ptyalin or salivary amylase which hydrolyses starch into the disaccharides, maltose, isomaltose and small dextrins. (1 mark)

**OR**

(a) Digestion of fat occurs in duodenum and jejunum parts of small intestine with the help of enzyme lipase that acts on emulsified fat to form fatty acids and glycerol. (1 mark)

(b) Small intestine is lined by epithelium which is specialised to absorb food. It has structure to increase its absorbing surface area several times. (1 mark)

**23.** Mendel took pea plant in his experiment with tallness and shortness trait produced progeny in $F_1$ generation there is no halfway characteristic *i.e.* plant of $F_1$ generation will show-tallness and dwarfness both. But for $F_2$ generation when $F_1$ progeny gametes combine together both the traits will show their separate identity in 3 : 1 ratio in which 70% offsprings will show dominant characters while 25% offsprings will show recessive characters. (2 marks)

**24.** As here $u = -0.25$ m and $f = 1/P = (1/3)$ m,

from lens formula $P = \frac{1}{f} = \frac{1}{v} - \frac{1}{u}$,

we have $3 = \frac{1}{v} - \frac{1}{-0.25}$

or $\frac{1}{v} = 3 - 4 = -1$ m

i.e. $v = -1$ m (1 mark)

i.e., the lens shifts the object from 25 cm to 1 m for clear vision, i.e., his near point is 1m. So in absence of glasses, he must hold the newspaper at a distance of 1m away from his eyes for clear vision. (1 mark)

**OR**

Let $x$ be the distance of the actual far point from the eye and hence from the concave lens placed close to the eye. The rays coming from infinity, after refraction through the concave lens, appear to come from the far point F.

$\therefore \quad u = -\infty, v = -x, f = ?$

By lens formula,

$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} = \frac{1}{-x} - \frac{1}{-\infty} = -\frac{1}{x} + 0 = -\frac{1}{x}$ (1 mark)

$\therefore$ Required focal length, $f = -x$

Required power, $P = \frac{1}{f} = -\frac{1}{x}$

The negative sign shows that the correcting lens is a concave lens. (1 mark)

**25.** The units which make up the nervous system are called neurons.

(i) End of dendrite tip of nerve cell.

(ii) Dendrite $\rightarrow$ cell body $\rightarrow$ axon to its ends.

($2 \times 1 = 2$ marks)

**26.** During asexual reproduction the traits which are present in the previous generation will remain the same with very minor differences. On this basis, the trait which are present in high percentage will be arising earlier i.e. trait 'B' having existence of 60% is likely to have arose earlier. (2 marks)

**27.** (a) Carbonate salt: Sodium carbonate: $Na_2CO_3$

(b) Chloride salt: Potassium chloride: KCl

(c) Copper salt: Copper sulphate: $CuSO_4$

(d) Sodium salt: Sodium sulphate: $Na_2SO_4$

(e) Nitrate salt: Ammonium nitrate: $NH_4NO_3$

(f) Sulphate salt: Ammonium sulphate: $(NH_4)_2SO_4$

($\frac{1}{2} \times 6 = 3$ marks)

**28.** (a) (i) Ethanol ($\frac{1}{2}$ mark)

(ii) Ethanoic acid ($\frac{1}{2}$ mark)

(iii) Ethene ($\frac{1}{2}$ mark)

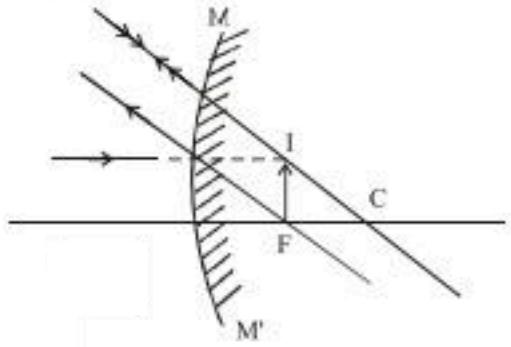
(b) (i) 2-methylpropanoic acid ($\frac{1}{2}$ mark)

(ii) Ethyl ethanoate ($\frac{1}{2}$ mark)

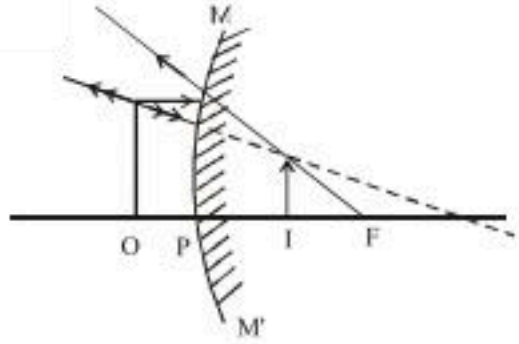
(iii) But-1, 2-diol ($\frac{1}{2}$ mark)

**29.** It the image formed by a mirror for all positions of the object in front of it is always virtual, erect and diminished, the mirror is convex (1 mark)

A convex mirror forms only virtual images for all positions of the ral object. The image is always virtual, erect, amaller that the object and is located between the pole and the focus.




($\frac{1}{2}$ mark)




(1 mark)

Power $= -\frac{1}{f}$

$10 = \frac{-1}{f}$

$f = \frac{-1}{10} = -0.1$ m (1 mark)

**30.** (i) 1 Kilowatt-hour = 1000 watt × 1 hour

= 1000 watt × 3600 sec.

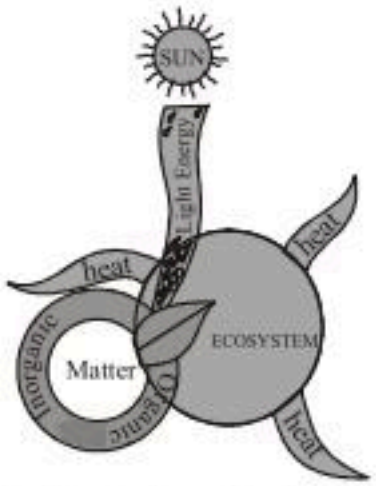
$= 3.6 \times 10^6$ watt - sec $= 3.6 \times 10^6$ joules. (1 mark)

(ii) P = 2000W, t = 1 hr. E = ?

$E = n \times P \times t = 1 \times \frac{2000}{1000} \times 1 = 2$ kWh. (1 mark)

T.E. $= 30 \times 2 = 60$ kWh. (1 mark)

**31.** As per 10% law of energy (1942), the energy available decreases by 90% with the rise of trophic level. 2000 J of energy available at the producer or $T_1$ level will provide only 2J of energy to second order carnivores ($T_4$). Therefore, an ecosystem cannot have food chains of several steps.




(2 + 1 marks)

**32.** (i) Length of conductor : It is directly proportional to the length of conductor. (1 mark)

(ii) Area of cross-section : It is inversely proportional to the area of cross-section. (1 mark)

(iii) Nature of a material. (½ mark)

(iv) Temperature of the conductor. (½ mark)

**OR**

(i) Power, $P = VI = 5 \times 0.5 = 2.5$ Watt (1 mark)

(ii) Resistance, $R = \frac{V}{I} = \frac{5}{0.5} = 10\Omega$ (1 mark)

(iii) Energy consumed, $W = P \times t = 2.5 \times 4 \times 3600$
$= 36000 = 3.6 \times 10^4$ J (1 mark)

**33.** (a) Three growth hormones in plant are-

(i) Auxin: It is synthesised in the young tip of roots and shoots. It promotes elongation and division of cell and root formation.

(ii) Gibberellins : They help in the growth of the stem and flowers.

(iii) Cytokinins : They promote cell division and delay leaf ageing. (1½ marks)

(b) The ability of a plant to recognise change and respond to that change is termed as the sensitivity of the plant. Yet plants have no nervous system and no muscle tissue, they use electrical and chemical means to convey the information from one cell to another cell. The leaves of the sensitive plant (*Mimosa pudica*) folds up in response to touch. These leaf movements are independent of growth whereas, the directional movements of the shoot of a germinating seedling breaking through the soil is growth dependent. (1½ marks)

**34.** (a) Calcium carbonate gives $CO_2$ gas when reacts with HCl.

$CaCO_3 + 2HCl \rightarrow CaCl_2 + CO_2 + H_2O$

$CO_2$ turns lime water milky when passed through it because of the formation of $CaCO_3$. When $CO_2$ so formed, is passed through lime water, lime water turns milky because of the formation of $CaCO_3$.

$CO_2 + Ca(OH)_2 \rightarrow CaCO_3 + H_2O$

On electrolysis of brine, $Cl_2$ gas is deposited over anode which gives calcium oxychloride on passing over slaked lime. $CaOCl_2$ is used in disinfecting the drinking water.

$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$

Therefore,

→ Metal carbonate 'X' is $CaCO_3$. (1 mark)

→ Solution 'Y' is lime water. (1 mark)

→ Gas 'G' is chlorine gas. (1 mark)

→ Dry 'Y' is dry $Ca(OH)_2$ (dry slaked lime).

→ Compound 'Z' is $CaOCl_2$ (bleaching powder). (1 mark)

(b) The chemical formula of plaster of paris is $CaSO_4.\frac{1}{2}H_2O$. (1 mark)

**OR**

(a)

| Substance | Action on Litmus Paper |
|---|---|
| Dry HCl gas | No change |
| Moistened $NH_3$ gas | Turns red to blue |
| Lemon juice | Turns blue to red |
| Carbonated soft drink | Turns blue to red |
| Curd | Turns blue to red |
| Soap solution | Turns red to blue |

(½ × 6 = 3 marks)

(b) (i) It is done to prevent the formation of lactic acid which spoils the milk. (1 mark)

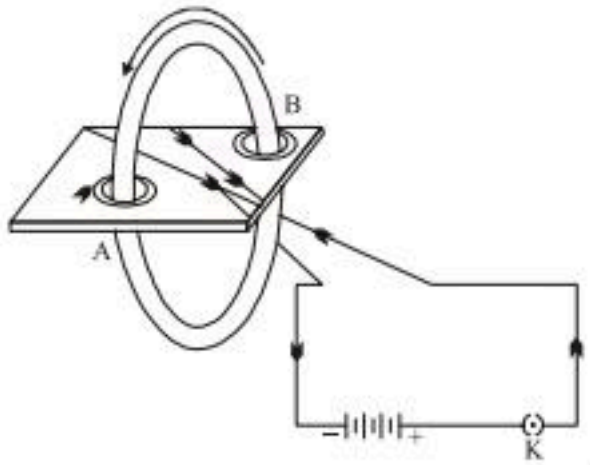
(ii) When milk boils, micro–organisms are destroyed and fermentation to lactic acid does not take place easily. Thus, milk takes long time to set as a curd. (1 mark)

**35.** Representation of the magnetic field path along which an imaginary free north pole would tend to move. The tangent at any point on the magnetic field line gives the direction of the magnetic field at that point. (1 mark)

(i) Emerge at north pole and merge at south pole. Inside the magnet, the direction of field lines is from south pole of magnet to its north pole and are closed curves.

(ii) field lines are crowded at the points where the magnetic field is stronger, and vice-versa.

(iii) No two magnetic field lines can intersect each other, If intersects there will be two direction of field, which is impossible. (2 marks)




(2 marks)

**36.** (i) The organ that produces sperms and secretes male hormones is testis. The hormone secreted by testis is testosterone.

**Function of testosterone include:**

(a) Stimulation of sperm production. (1 mark)

(b) Stimulation of the development of secondary sexual characters in males. (1 mark)

(c) Development, maturation and functioning of accessory sex organs like vas deferens and seminal vesicles. (1 mark)

(ii) Fallopian tubes (1 mark)

(iii) The embryo gets nourishment from the mother's blood with the help of a special tissue called placenta. This tissue is embedded in the uterine wall, containing villi on the embryo's side of the tissue. On the mother's side blood spaces are present which surround the villi. This provides a large surface area for glucose and oxygen to pass from the mother to the embryo. (1 mark)

**37.** (a) Corrosion is a natural process of deterioration of a metal or material with the reaction of surrounding which results into the production of more stable form such as oxide, hydroxide or sulphide.

e.g. Iron gets corrodded in presence of water and oxygen and forms brown coloured iron oxide. (2 marks)

(b) The methods of preventing corrosion –

(i) Painting/ Oiling/ Galvanizing/ Chrome plating/ making alloys.

(ii) The best way to prevent rusting of iron is making the iron article as cathode. This method is known as cathodic protection.

**Note :** Saline water accelerates the formation of rust as it is highly conducting. (2 marks)

**OR**

(b) (i) The iron metal at the bottom of ship is connected with more reactive metal like Mg than iron. This is called cathodic protection. (1 mark)

Zn is the best metal for metal plating on iron article as it has higher oxidation potential than Ni, Cu, Sn. The process of coating of iron surface with zinc is known as galvanization.

Note : Galvanized iron sheets maintain their lusture due to the formation of protective layer of basic zinc carbonate. (1 mark)

**38.** (i) This indicates the presence of starch.

(ii) Destarched leaves, strips of black paper and iodine solution.

(iii) The plant with the leaves exposed to light of a lamp, a night before the experiment.

(iv) Alcohol, iodine and water. (4 × 1 = 4 marks)

**39.** (a) Benzene (1 mark)

(b) Medium in which speed of light is less is known as optically denser medium and the medium in which speed of light is more is optically rarer medium. (1 mark)

(c) (i) **Statement of first law of refraction :** The incident ray, the normal to the transparent surface at the point of incidence and the refracted ray, all lie in one and the same plane. (1 mark)

(ii) **Statement of second law of refraction :** The ratio of sine of angle of incidence to the sine of the angle of refraction is constant and is called refractive index of the second medium with respect to the first medium. It is represented by the symbol ${}_1\mu_2$ i.e., $\frac{\sin i}{\sin r} = {}_1\mu_2$

(${}_1\mu_2$ means refractive index of second medium with respect to the first medium) (1 mark)

This law is called Snell's law.

**OR**

(c) $a_{\mu_g} = 1.5 ; v = ? ; c = 3 \times 10^8$ m/sec

$$a_{\mu_g} = \frac{c}{v} \Rightarrow v = \frac{c}{a_{\mu_g}} = \frac{3\times10^8}{1.5} = 2\times10^8 \text{ m/sec}$$

(2 marks)