CBSE Class 10 Science

Sample Paper 10 (2020-21)

Maximum Marks: 80

Time Allowed: 3 hours

General Instructions:

i. The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
ii. Section–A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple-choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.
iii. Section–B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should in the range of 30 to 50 words.
iv. Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should in the range of 50 to 80 words.
v. Section–D - question no. 34 to 36 are long answer type questions carrying 5 marks each. Answers to these questions should be in the range of 80 to 120 words.
vi. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
vii. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

1. What are the effects of oxidation reactions in everyday life ?

OR

Write a balanced chemical equation with state and symbols for the following reactions:

i. Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.
ii. Sodium hydroxide solution reacts with a hydrochloric acid solution to produce

sodium chloride solution and water.

2. When potassium nitrate is heated, it decomposes into potassium nitrite and oxygen. Write the balanced chemical equation for the reaction and add the symbol wherever necessary.
3. While cooking, if the bottom of the vessels is getting blackened on the outside, it means that:
   a. The food is not cooked completely
   b. The fuel is not burning completely
   c. The fuel is burning completely
   d. The fuel is wet
4. Which material is best conductor?
5. An acidic solution has pH of 5. It is diluted with water. Will its pH increase or decrease ?
6. What is an optically rarer medium?

OR

Where is the image formed when an object is at large distance from a concave mirror?

7. List the abiotic components of an ecosystem.
8. What type of core used to make an electromagnet?
9. Name the instrument used for measuring potential difference.

OR

Find the minimum resistance that can be made using five resistors each of $\frac{1}{5}\Omega$.

10. Name a metal which can melt even in your hand. To which group of the periodic table does it belong?
11. What are the essential requirements for photosynthesis?

OR

Name the blood vessel which carries waste products to the kidney?

12. How many pairs of chromosomes are found in human beings?

OR

What are Mendel's hypothetical factors called in modern terminology?

13. i. Which part of the alimentary canal helps in eliminating unabsorbed food?
    ii. How is the exit of waste material regulated?
14. **Assertion (A):** HCl gas does not change the color of dry blue litmus paper.

    Reason (R): HCl gas dissolves in the water present in wet litmus paper to form H^+ ions.
    a. Both A and R are true and R is the correct explanation of the assertion.
    b. Both A and R are true and R is the correct explanation of the assertion.
    c. A is false but R is true.
    d. A is true but R is false.
15. **Assertion:** A voltmeter and ammeter can be used together to measure resistance but not power.

    Reason : Power is proportional to voltage and current.
    a. Both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion.
    b. Both assertion and reason are CORRECT but, reason is NOT THE CORRECT explanation of the assertion.
    c. Assertion is CORRECT but, reason is INCORRECT.
    d. Assertion is INCORRECT but, reason is CORRECT.

OR

Assertion (A): A compass needle is placed near a current-carrying wire. The deflection of the compass needle decreases when the compass needle is displaced away from the wire.
Reason (R): Strength of a magnetic field decreases as one moves away from a current-carrying conductor.

a. Both A and R are true and R is correct explanation of the assertion.
b. Both A and R are true but R is not the correct explanation of of the assertion
c. A is true but R is false.
d. A is false but R is true.

16. **Assertion (A):** Pollen grains from the carpel stick to the stigma of the stamen.
    Reason (R): The fertilised egg cells grow inside the ovules and become seeds.
    a. Both A and R are true and R is correct explanation of the assertion.
    b. Both A and R are true but R is not the correct explanation of the assertion.

c. A is false but R is true.

d. A is true but R is false.

17. **Read the following and answer any four questions:**

When the ray of light travels from 1 transparent medium to another it will change the direction in the second medium. The extent of change in direction that takes place in a pair of mediums is expressed in terms of the refractive index. The value of the refractive index for a given pair of medium depends upon the speed of light in the second medium.

i. The refractive index of 4 substance P, Q, R and S are 1.50, 1.36. 1.77 and 1.31 respectively. The speed of light is maximum in the substance:

   a. P

   b. Q

   c. R

   d. S

ii. If medium 1 is in a vacuum then the refractive index of medium 2 is considered with respect to it is called _____.

   a. absolute refractive index

   b. refractive index

   c. magnification

   d. none of the above

iii. The Refractive index of water is

   a. 1.33

   b. 1.50

   c. 2.42

   d. 1.36

iv. The speed of light in air is _____

   a. 3×10^8 m/s

   b. 3×10^7 mm/s

   c. 3×10^{10} cm/s

   d. 3×10^6 km/s

v. The Refractive index of quartz is _____ than/to alcohol.

   a. less

   b. more

c. equal

d. cannot be compared

18. **Read the following and answer any four questions:**

The female germ cells or eggs are made in ovaries. They are responsible for the production of hormones. The different part of the female reproductive system consists of ovaries, fallopian tubes, uterus and vagina.

i. Mention the site of fertilisation.

a. ovary

b. fallopian tubes

c. uterus

d. cervix

ii. Which of the following is not part of the female reproductive system?

a. Ovary

b. Oviduct

c. Uterus

d. Vas deferens

iii. Name the site of implantation and development of the baby in human females.

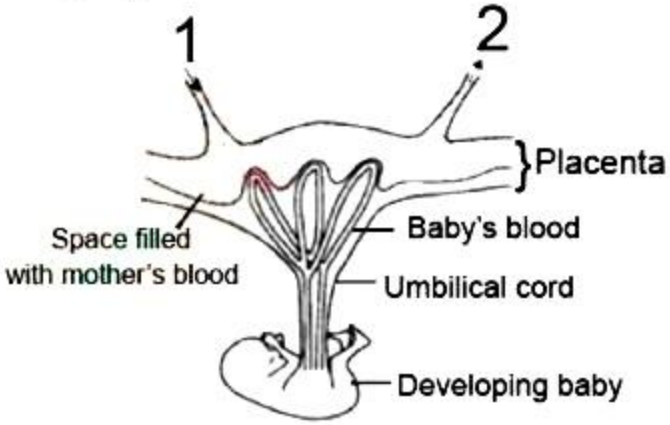
a. Uterus

b. Fallopian tubes

c. Testis

d. Ureter

iv. The diagram shows the arrangement of blood vessels in the uterine wall and placenta of a pregnant woman

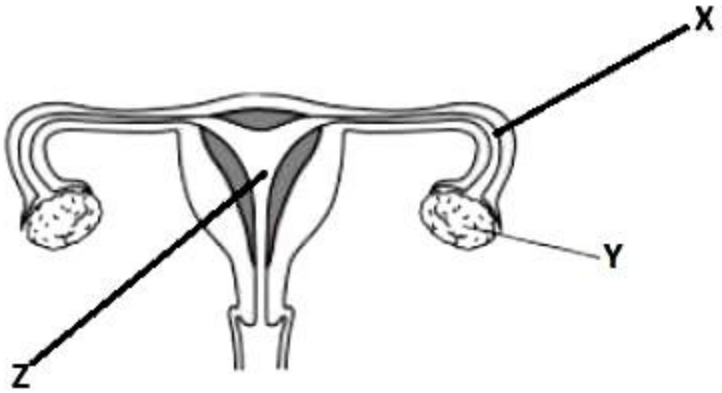


Which of the following will increase in concentration in the blood as it flows from 1 and 2?

a. Amino acids

b. Carbon dioxide
c. Glucose
d. Oxygen

v. The diagram shows a section of the female reproductive system:



During pregnancy, where does mitosis occur in the cells of the embryo:

	X	Y	Z
(a)	Yes	Yes	Yes
(b)	Yes	Yes	No
(c)	Yes	No	Yes
(d)	No	No	Yes

19. **Read the following and answer any four questions:**

Nowadays chemical pesticides are excessively used to protect the crops from disease and pests. The chemical is washed down into the soil. From soil, these are absorbed by the plant along with water and minerals and from the water bodies. The human being occupies the top level in any food chain, the maximum chemical gets accumulated in their bodies.

i. Accumulation of non-biodegradable pesticides in the food chain in an increasing amount at each higher trophic level is known as:
   a. eutrophication
   b. pollution
   c. biomagnification
   d. accumulation

ii. The decomposer in an ecosystem:
   a. convert inorganic materials to simpler forms

b. convert inorganic materials to inorganic forms
c. convert inorganic materials into organics compound
d. do not breakdown organic compounds

iii. In a food chain consisting of grass, frog, bird and insects, where will the concentration of harmful chemicals is maximum:
a. grass
b. frog
c. bird
d. insects

iv. Pesticides enter the food chain the _____ level.
a. consumer
b. producers
c. both consumer and producer
d. none of these

v. Complete the following grass, _____, Human
a. goat
b. grasshopper
c. lion
d. mice

20. **Read the passage given below and answer any four of the following questions:**

In a redox reaction, both oxidation, as well as reduction, takes place together, oxidation involves loss of electrons while reduction involves the gain of electrons. The redox-reaction may involve a combination of atoms and molecules, displacement of metals, or non-metals.

Example: $CuSO_4 + Zn \longrightarrow ZnSO_4 + Cu$

displacement of Cu metal from its compound.

i. In the above equation, which of the following gets reduced?
a. $CuSO_4$
b. Zn
c. $ZnSO_4$
d. None of these

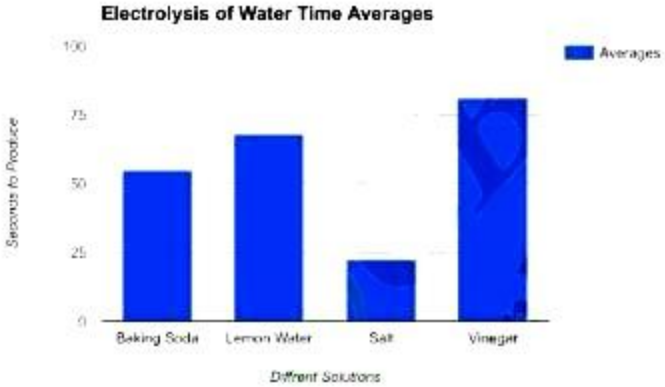
ii. The oxidising agent generally:
a. loses the electrons

b. gains the electron
c. is in a gaseous state
d. both b and c

iii. Identify the oxidising agent and reducing agent in the above reaction
a. Copper, Zinc
b. Zinc, Copper
c. Zinc, Zinc
d. Copper, Copper

iv. Identify the type of reaction.
a. Double displacement reaction
b. Displacement reaction
c. Substitution reaction
d. Addition reaction

v. Based on the electrolysis of different solutions in water comment whose electrolysis will be the fastest



a. lemon water
b. baking soda
c. salt
d. vinegar

Section B

21. Waste products of plants are useful for human beings. Is it true? Explain.

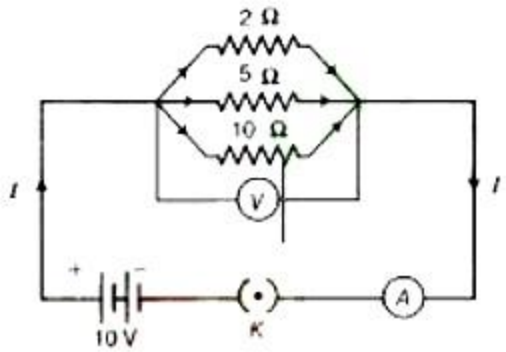
OR

List four functions of the human heart. Why is double circulation necessary in the human body?

22. In the context of reproduction of species state the main difference between fission and

fragmentation. Also, give one example of each.

23. Explain the combustion reaction with the examples.
24. Reeta's grandfather always add iodised common salt to his meals. Iodised common salt is better than ordinary common salt. He also has a habit of taking pickle, sauce, processed food and junk food which contain lots of sodium chloride. He is also suffering from hypertension. Doctors advised him that he should take less common salt.
    i. Why Doctors advised Reeta's grandfather to take less common salt.
    ii. Why should we prefer iodised salt?
    iii. What values are possessed by Reeta's grandfather?
25. Rhea and Harnoor were at the dining table having their dinner. An argument broke out between them about convex and concave mirror as to which mirror forms an inverted, image. Losing no time Rhea took a highly polished spoon. She made Harnoor look into the depressed surface of the spoon and then the bulging surface. The images formed in the two cases were different. In the first case, the image formed was inverted while in the second case, it was erect. Then, she explained to Harnoor about the two surfaces acting as mirrors and also which formed an inverted image. This at once stopped the argument.
    i. Which of the two mirrors forms an inverted image: concave or convex?
    ii. What are the values shown by Rhea and Harnoor?
    iii. Give one use of a concave mirror.
26. A circuit diagram is given as shown below:



Calculate

    i. the total effective resistance of the circuit.
    ii. the total current in the circuit.
    iii. the current through each resistor.
27. How do Mendel's experiments proved that traits are inherited independently?

OR

In a pea plant, find the contrasting trait if

i. the position of flower is terminal
ii. the flower is white in colour
iii. shape of pod is constricted

28. A metallic wire of resistance R is cut into ten parts of equal length. Two pieces each are joined in series and then five such combinations are joined in parallel. What will be the effective resistance of the combination?
29. Leaves of a healthy potted plant were coated with vaseline to block the stomata. Will this plant remain healthy for long? State three reasons for your answer.
30. A compound 'X' used for drinking has pH =7.Its acidified solution undergoes decomposition in presence of electricity to produce gases 'Y' and 'Z' The volume of Y is double than Z. Y is highly combustible whereas Z is a supporter of combustion. Identify X, Y & Z and write the chemical reactions involved.
31. Two elements P and Q belong to the 3rd period of the modern periodic table and are in group 1 and group 2, respectively. Compare their following characteristics in tabular form:
    i. The number of electrons in their atoms
    ii. The sizes of their atoms
    iii. Their metallic character
    iv. Their tendencies to lose electrons
    v. The formula of their oxides
    vi. The formula of their chlorides
32. What is atomic radius? Why does atomic radius decrease across a period?
33. i. Distinguish between 'roasting' and 'calcination'. Which of these two is used for sulphide ores and why?
    ii. Write a chemical equation to illustrate the use of aluminium for joining cracked railway lines.
    iii. Name the anode, the cathode and the electrolyte used in the electrolytic refining of impure copper.
34. Describe the structure and functioning of nephron.

OR

Describe one experiment to demonstrate that chlorophyll is essential for photosynthesis.

35. Describe Newton's disc experiment to show that white light is composed of seven spectrum colours.
    Why seven colours combine to give almost white but not perfectly white ?
36. a. Draw magnetic field lines produced around a current-carrying straight conductor passing through cardboard. Name, state and apply the rule to mark the direction of these field lines.
    b. How will the strength of the magnetic field change when the point where the magnetic field is to be determined is moved away from the straight wire carrying constant current? Justify your answer.

OR

With the help of a labeled circuit diagram illustrating the pattern of field lines of the magnetic field around a current-carrying straight long conducting wire. How is the right-hand thumb rule useful to find the direction of the magnetic field associated with a current-carrying conductor?

CBSE Class 10 Science

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Solution

Section A

1. **Rancidity of food:** It is a slow oxidation of oils and fats present in food material resulting in some bad smell and taste.

   Corrosion of metal: The process in which metals are eaten up gradually by the action of air, moisture or chemicals on their surface. For Example: Rusting of iron

   OR

   i. $BaCl_2(aq) + Na_2SO_4(aq) \longrightarrow BaSO_4(s)\downarrow + 2NaCl(aq)$ **[balanced chemical equation]**

   ii. $NaOH\ (aq) + HCl\ (aq) \longrightarrow NaCl\ (aq) + H_2O(l)$ **[balanced chemical equation]**

2. When potassium nitrate is heated, it decomposes into potassium nitrite and oxygen.
   $2KNO_3\ (s) \xrightarrow{\triangle} 2KNO_2\ (s) + O_2\ (g) \uparrow$

3. (b) The fuel is not burning completely
   Explanation: If the bottom of the vessels is getting blackened (due to deposit of soot) on the outside while cooking, it is an indication that the fuel is not burning completely. When the fuel does not burn completely, some carbon particles remain un-oxidised and form soot.

4. Silver of resistivity 1.60×10^{-8} ohm m is the best conductor.

5. pH will increase.

6. A medium in which light travels comparatively faster than the other medium is called an optically rarer medium.

   OR

   When an object is placed at infinity or at large distance then the image formed is at the focus of the concave mirror with real , inverted and highly diminished nature.

7. The abiotic components of an ecosystem are of two types :
   (i) Climate including temperatures, light, wind, gases, humidity, rain and water (also

wave action, water currents)

(ii) Edaphic including soil, substratum, topography, background, minerals and pH.

8. The type of core used in the electromagnet is soft iron core.
9. A voltmeter is an instrument used for measuring potential difference between two points in an electric circuit.

OR

For getting minimum resistance R we can connect five resistors in parallel Combination .We know that :$R = 1/5, n = 5$

$R_{eq} = \frac{R}{n} = \frac{1/5}{5} = \frac{1}{25}\Omega$

10. Generally metals have high melting and boiling points. However, gallium has very low melting point. The melting point for gallium is relatively low, at 85.6°F (29.8°C). It can melt even in the hand. It belongs to group IIIA of the periodic table.
11. Light and chlorophyll are the essential requirements for photosynthesis.

OR

The Renal artery takes the impure blood to the kidney for separation of nitrogeneous wastes and after purification, the renal vein carries the purified blood to the heart.

12. 23 pairs of chromosomes are found in human beings.

OR

Genes

13. i. Anus helps in eliminating undigested food from the body.
    ii. Anal sphincter regulates the exit of undigested food.
14. (a) Both A and R are true and R is the correct explanation of the assertion.
15. (c) Assertion is CORRECT but, reason is INCORRECT.

OR

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

16. (d) A is true but R is false.
17. a. (d) S

b. (a) absolute refractive index

c. (a) 1.33

d. (a) 3×10^8 m/s

e. (b) more

18. i. (b) Fallopian tubes

ii. (d) Vas deferens

iii. (a) Uterus

iv. (b) Carbon dioxide

v.

	X	Y	Z
(c)	Yes	No	Yes

19. i. (c) biomagnification

ii. (b) convert organic material to inorganic forms

iii. (c) birds

iv. (b) producer

v. (a) goat

20. i. (a) $CuSO_4$

ii. (b) gains the electron

iii. (a) Copper, Zinc

iv. (b) Displacement reaction

v. (a) lemon water

Section B

21. Yes, it is true, some plant wastes are useful for humans beings as:

i. Plants like oak store their excretory products as tannin in the trunk which is used in the treatment of leather.

ii. Essential oils excreted by plants like sandalwood oil, olive oil, eucalyptus oil etc., are widely used in household purposes.

iii. Gums from plants are widely used to make adhesives.

iv. Resins are used to make varnishes, glazing agents etc.

v. Natural rubber obtained from the rubber plant is used as a raw material in the tyre industry.

OR

Four function of human heart are:-

i. It receives deoxygenated blood from body.

ii. It receives oxygenated blood from lungs.

iii. It pumps oxygenated blood to different parts of body.

iv. It have efficient supply of oxygen gas (O_2) for its high energy needs.

Double circulation is necessary in the human body for separation of oxygenated and deoxygenated blood.

22. Fission: It is method of asexual reproduction in unicellular forms of life. In this process the parent organism splits to form two or more daughter cells. Example: Ameoba.
A Fragmentation: It is the process found in multicellular organisms. The filament break up into two or more pieces upon maturation. These pieces then grow into new individuals.
Example: Spirogyra.

23. When a substance burns in the presence of oxygen, the reaction is called combustion. An example of a combustion reaction is given as
$CH_4 + O_2 \longrightarrow CO_2 + H_2O$ + heat and light

24. i. The doctor advised Reeta's grandfather to take less common salt in his diet because he is suffering from high blood pressure.

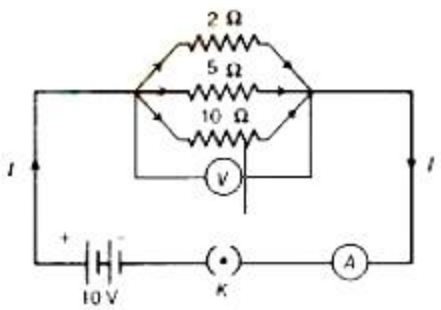
ii. Iodised salt contains iodine which is essential for the synthesis of a hormone called thyroxine. Iodine deficiency leads to a disease called goitre.

iii. He is concerned about his health and have scientific knowledge.

25. i. A concave mirror forms an inverted image.A concave mirror can form a real and inverted image. When the object is placed very close to the mirror, the image formed is virtual, erect and magnified.

ii. Rhea: Concern for her brother to give him the correct knowledge.
Harnoor: Ability to learn and understand, respect for elders.

iii. Concave mirror can be used as a shaving mirror.

26. 

i. Effective resistance is,

$\frac{1}{R_{eff}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$

$= \frac{1}{2} + \frac{1}{5} + \frac{1}{10} = \frac{5+2+1}{10} = \frac{8}{10}$

$\Rightarrow R_{eff} = \frac{10}{8} = 1.25\Omega$

ii. Total current,

$I = \frac{V}{R_{eff}}$

$= \frac{10}{1.25}$

$= 8A$

iii. Current through each resistor,

$I_1 = \frac{V}{R_1} = \frac{10}{2} = 5A,$

$I_2 = \frac{V}{R_2} = \frac{10}{5} = 2A$

and

$I_3 = \frac{V}{R_3} = \frac{10}{10} = 1A.$

27. Mendel proposed Law of Independent Assortment on the basis of a dihybrid cross between two homozygous parents. He selected a dominant plant with round and yellow seeds and a recessive plant with wrinkled and green seeds, yields F1 offspring showing the dominant form of both traits, viz. round and yellow F1 plants, on selfing, produce F2 progeny with two parental and two new recombinant phenotypes, that is round yellow: round green : wrinkled yellow: wrinkled green in the ratio of 9 : 3 : 3 : 1. This ratio is called Mendel's dihybrid phenotypic ratio. The factors (genes) of different traits are independent of each other in their distribution into the gametes and in the progeny. This is Mendels law of independent assortment.

OR

Contrasting trains were used by mendel and were classified as dominant or recessive. Mendel used 7 traits of pea plant for his experiments. Out of which 3 are.

Character	Given Trait	Contrasting Trait
(i) Position of flower	Terminal	Axial (dominant)
(ii) Colour of flower	White	Violet (dominant)
(iii) Shape of pod	Constricted	Full (dominant)

28. ∵The resistance of a conductor is directly proportional to the length of the conductor

$(R \propto l)$.

∴ The resistance of the metallic wire, when it is cut into ten parts of equal length,r = $\frac{R}{10}$

Two such pieces when joined in series, the equivalent resistance of these two parts = r + r

= 2r = $\frac{2R}{10}$

∴ Equivalent resistance of two parts

=$2 \times \frac{R}{10}$

= $\frac{R}{5}$

5 such parts are connected in parallel.

∴ the total resistance R',

$\frac{1}{R'} = \frac{1}{\frac{R}{5}} + \frac{1}{\frac{R}{5}} + \frac{1}{\frac{R}{5}} + \frac{1}{\frac{R}{5}} + \frac{1}{\frac{R}{5}}$

= $\frac{25}{R}$

Hence, R' = $\frac{R}{25}$

29. If waxy coating is made on the surface of leaf, loss of water in the form of water vapour does not take place. Even the gaseous exchange will not take place. So, photosynthesis will either be reduced or will not take place.

    The plant will not remain healthy for long because:

    (a) Exchange of gases will not take place.

    (b) Photosynthesis will either be reduced or will not take place due to lack of CO_2.

    (c) Transpiration will not take place, so there will be no mechanism for cooling in hot weather.

30. We use water for drinking and being a neutral compound it has pH = 7.

    So, **compound 'X' = Water (H_2O)**

    Acidified solution of water undergoes decomposition to form hydrogen (H_2) and oxygen gas (O_2) .Hydrogen gas formed is double in volume than oxygen gas and is highly combustible. Oxygen gas is a supporter of combustion.

    So, **Y = H_2 gas ; Z = O_2 gas**

    $2H_2O \rightarrow 2H_2 + O_2$

31. Suppose P and Q the first two elements of 3rd period. We can guess the electronic cofiguration and name of the element based on its position in the periodic table. The element P is sodium (Na) with atomic number 11 and electronic configuration 2, 8, 1 and element Q is magnesium (Mg) with atomic number 12 and electronic configuration 2, 8, 2. Then comparison of their characteristics is as follows:

Characteristics	P	Q
(i) The number of electrons	11	12
(ii) Sizes of atoms	larger	Smaller
(iii) Metallic character	Higher	Lesser
(iv) Tendencies to lose electrons	Higher	Lower
(v) Formula of their oxides	P_2O	QO
(vi) Formula of their chlorides	PCI	QCl_2

32. Atomic radius is defined as the distance from the centre of the nucleus of atom to the outermost shell of electrons. The atomic radius decreases along the period. In moving from left to right across the period, the charge on the nucleus increases by one unit (due to increase in atomic number), but the additional electron goes to the same shell. As a result, outer electrons are pulled in closer to the nucleus. This causes the decrease of atomic size.

33. i. Roasting: It is the process in which sulphide ores of the metals are converted into oxides by heating them in the presence of excess air. For example, zinc sulphide is converted into zinc oxide by roasting.

$$2ZnS(s) + 3O_2(g) \underset{Roasting}{\overset{Heat}{\longrightarrow}} 2ZnO(s) + 2SO_2(g)$$

Calcination: It is the process in which carbonate ores of the metals are decomposed into oxides by heating them in the absence or limited air. For example, zinc carbonate is decomposed into zinc oxide and carbon dioxide by calcination.

$$ZnCO_2(s) \underset{Calcination}{\overset{Heat}{\longrightarrow}} ZnO(s) + CO_2(g)$$

ii. Out of roasting and calcination, only roasting is used for sulphide ores. This is because it is easier to obtain metal from its oxide as compared to its sulphide.

$$\underset{Iron(III)\,Oxide}{Fe_2O_3(s)} + \underset{\text{Aluminium}}{2AI(s)} \xrightarrow{\Delta} \underset{Molten\ iron}{2Fe(l)} + \underset{\text{AluminiumOxide}}{A_2O_3(s)}$$

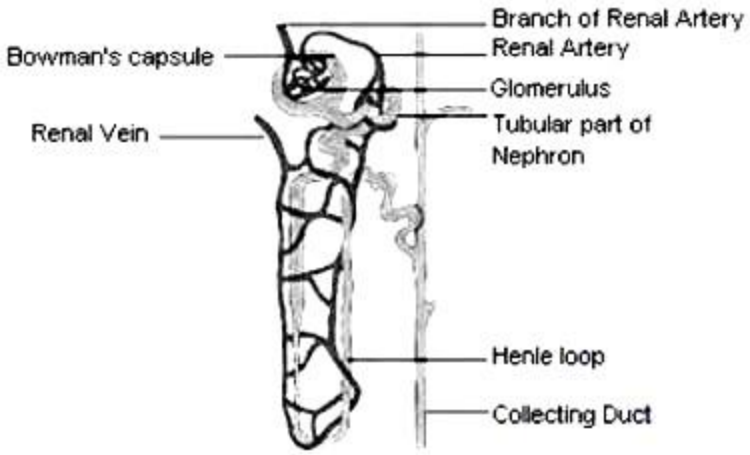
iii. Anode - Impure copper

Cathode - Strip of pure copper

Electrolyte - Acidified copper sulphate solution.

34. The excretory units of the kidneys are called nephrons. Each kidney has a large number of nephrons packed close together.

Each nephron has a cup-shaped start called the 'Bowman's capsule' into which project a tuff of capillaries called 'Glomerulus'. The blood is brought into the kidney by the glomerulus. After the filtration in the Bowman's capsule, blood enters into the tubular part of the nephron where useful molecules like glucose, amino acids, salts, vitamins and a major amount of water etc. are selectively reabsorbed as urine flows along the tube. The final filtrate is finally drained into the ureters. The final waste contains water and nitrogenous wastes like urea, uric acid, etc.

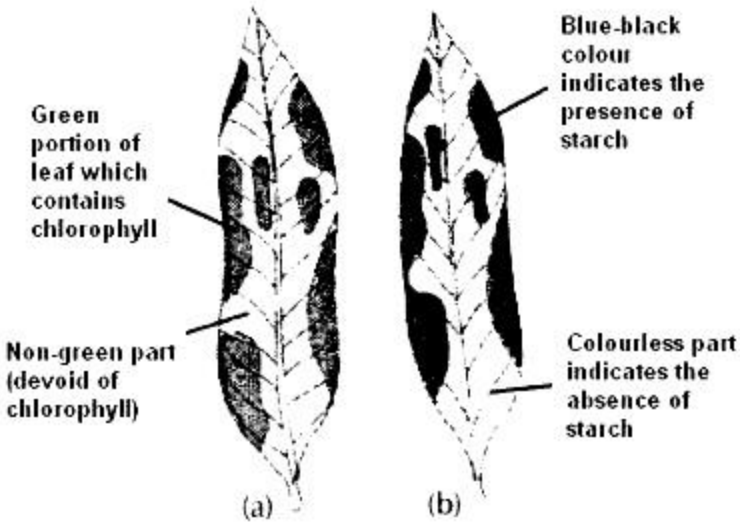


Functioning of Nephron

i. Filtration: Filtration of blood takes place in Bowman's capsule from the capillaries of glomerulus. The filtrate passes into the tubular part of the nephron. This filtrate contains glucose, amino acids, urea, uric acid, salts and a major amount of water.
ii. Re-absorption: As the filtrate flows along the tubule useful substances such as glucose, amino acids, salts and water are selectively re-absorbed into the blood by capillaries surrounding the nephron tubule.
iii. Urine: The filtrate which remains after re-absorption is called urine. Urine contains dissolved nitrogenous waste, i.e. urea and uric acid, excess salts and water. Urine is collected from nephrons by the collecting duct to carry it to the ureter.

OR

A potted plant with variegated leaves like money plant was taken for the activity. The plant was kept in a dark room for three days so that all the starch gets used up. Then the plant was kept in sunlight for about six hours. A leaf was plucked from the plant and the green areas in it were marked and traced on a sheet of paper. The leaf was dipped in boiling water for a few minutes and after that it was immersed in a beaker containing alcohol. The beaker was placed in a water bath and heated till the alcohol started boiling.



It was observed that the leaf decolourised when it was boiled in alcohol and the solution became green as alcohol removed chlorophyll.

After this, the leaf was dipped in iodine solution for a few minutes and rinsed off.

The blue-black colour appeared only on those parts of the leaf which were green in colour and the variegated parts remained unaffected.

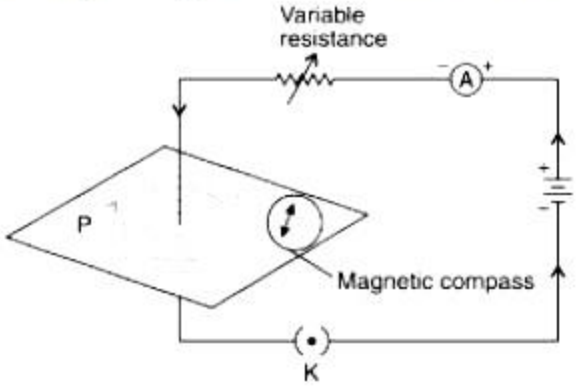
It can be concluded from the above activity that the starch formation takes place only in green parts of the leaf which contain chlorophyll.

35. Newton's colour disc: White light consists of seven colours. This can easily be proved byNewton's colour disc. A circular disc of cardboard is painted with coloured radial bands. Order of these colours and their relative widths are the same as in the spectrum of sunlight. On rotating disc rapidly about its centre, all the colours blend and a sensation of almost white light is produced on the retina due to persistence of vision.

Since we have used pigment colours instead of spectrum colours, the disc will not appear pure white but will give a dull appearance. Pigment colours are not pure colours and hence due to impurities, the appearance of the disc is grayish instead of perfectly white.

36. a. The magnetic field lines produced around a current-carrying straight conductor

passing through cardboard is shown below.

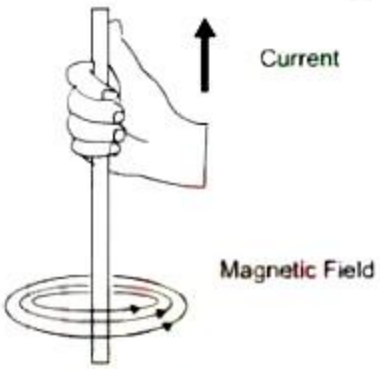


A right-hand thumb rule is applied to find the direction of these field lines. Imagine that you are holding a current-carrying straight conductor in your right hand such that the thumb points towards the direction of the current. Then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field.

b. When we move away from the straight wire, the deflection of the needle decreases which implies the strength of the magnetic field decreases. The reason is that the concentric circles representing the magnetic field around a current-carrying straight wire become larger and longer as the distance increases.

OR

The pattern of the magnetic field lines of the magnetic field around a current-carrying straight long conducting wire are in a circular pattern in the form of concentric circles as shown in the below diagram:



As depicted in the diagram, the direction of the magnetic field can find out by using the right-hand thumb rule which says that if we are holding a current-carrying conductor in the right hand such that the thumb will point towards the direction of the current. The fingers will wrap around the conductor in the direction of the field lines of the magnetic field.