

Class 10 - Science
Sample Paper - 10 (2022-23)

Maximum Marks: 80

Time Allowed: : 3 hours

General Instructions:

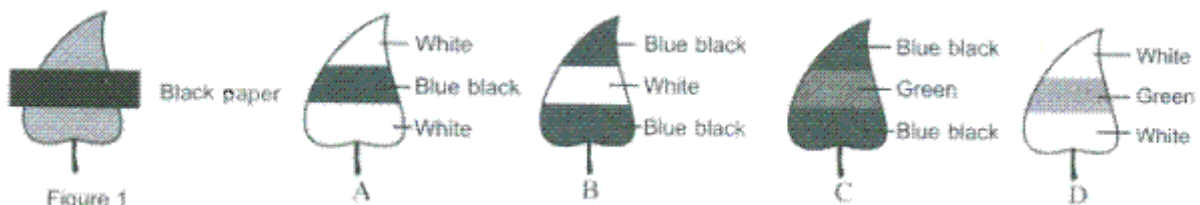
- i. This question paper consists of 39 questions in 5 sections.
 - ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
 - iii. Section A consists of 20 objective type questions carrying 1 mark each.
 - iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.
 - v. 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.
 - vi. 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.
 - vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.
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Section A

1. $2\text{FeSO}_4 \xrightarrow{\text{heat}} \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{SO}_3$
The above reaction is
 - a) Double displacement reaction
 - b) Combination reaction
 - c) Displacement reaction
 - d) Decomposition reaction
2. Which of the given statement is correct:
Statement A: All metals form basic oxides.
Statement B: Few non-metals form neutral oxides.
 - a) Both the statements A and B are false.
 - b) Statement B is true. Statement A is false.
 - c) Statement A is true. Statement B is false.
 - d) Both the statements A and B are true.
3. Which hormone causes uterine contraction that leads to labour pain?
 - a) Vasopressin
 - b) Thyroxin
 - c) Estrogen

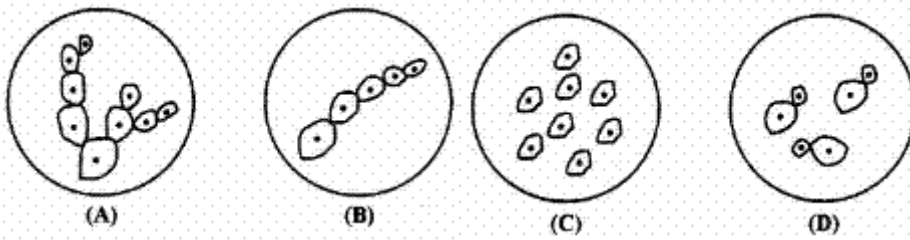
d) Progesterone

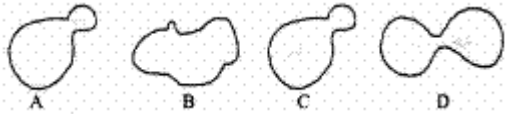
4. It a round green seeded pea plant (RRYY) is crossed with wrinkled yellow seeded pea plant (rr yy) the seeds to be produced in F₁ generation will be:
- round and green
 - wrinkled and green
 - Wrinkled and yellow
 - round and yellow
5. A piece of red cloth when suitably illuminated may look black, but a piece of black cloth will never appear red. This phenomenon occurs because:
- Red cloth reflects all colours
 - Black cloth reflects all colours
 - Black cloth reflects only black light
 - Black absorbs all the colours
6. What is another name for tissue culture?
- None of these
 - Artificial vegetative propagation
 - Micropropagation
 - Natural vegetative propagation
7. The formula which gives the relationship between the object distance, image distance and focal length of the spherical mirror is:
- $\frac{1}{v} = \frac{1}{u} + \frac{1}{f}$
 - $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$
 - $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$
 - $\frac{1}{v} = \frac{1}{u} + \frac{1}{f}$
8. A leaf from a destarched plant is covered with black paper strip as shown in figure 1. The starch test is done on the leaf after 8 hours.



The result will be as shown in diagram.

- D
 - C
 - A
 - B
9. Which growth hormone is present in the tip of the stem?
- Ethylene
 - Gibberellin
 - Auxin
 - Cytokinin
10. The following are the sketches made by some students. The sketch not illustrative of budding in yeast is :



- a) B
 b) D
 c) C
 d) A
11. Which one of the endocrine gland is known as a master gland?
 a) Adrenal
 b) Parathyroid
 c) Pituitary
 d) Thyroid
12. Generally, non-metals are not lustrous. Which of the following nonmetal is lustrous?
 a) Iodine
 b) Nitrogen
 c) Sulphur
 d) Oxygen
13. Out of the following diagram which one depicts a stage in binary fission of Amoeba?

 a) A
 b) B
 c) C
 d) D
14. Which of the following statements are usually correct for carbon compounds?
 These
 i. are good conductors of electricity
 ii. are poor conductors of electricity
 iii. have strong forces of attraction between their molecules
 iv. do not have strong forces of attraction between their molecules
- a) (ii) and (iii)
 b) All of these
 c) (ii) and (iv)
 d) (i), (ii) and (iv)
15. Alcohol produces:
 a) Non-luminous flame
 b) Luminous flame
 c) Sooty flame
 d) Smoky flame
16. Which of the following is(are) an endothermic process(es)?

- i. Dilution of sulphuric acid
- ii. Sublimation of dry ice
- iii. Condensation of water vapours
- iv. Evaporation of water

- a) (iii) only
- b) (ii) and (iv)
- c) (i) and (iii)
- d) (ii) only

17. **Assertion (A):** Baking soda creates acidity in the stomach.

Reason (R): Baking soda is alkaline.

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

18. **Assertion (A):** Electric current flowing through a metallic wire is directly proportional to the potential difference across its ends.

Reason (R): Ohms law expression $V = IR$, where R (resistance) of the wire is always varying.

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

19. **Assertion (A):** Lipases help in emulsification of fats.

Reason (R): Lipases hydrolyses fats and oils.

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

20. **Assertion (A):** When a piece of copper metal is added to dilute sulphuric acid, the solution turns blue.

Reason (R): Copper reacts with dilute sulphuric acid to form copper (II) sulphate solution.

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

Section B

21. How will you use two identical prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw the diagram.

OR

Why the eye lens is not perfectly solid ?

22. How do decomposers obtain food?

23. Why do we prefer a convex mirror as a rear view mirror in vehicles?
24. Why is cigarette smoking injurious to health?
25. Why do acids not show acidic behaviour in the absence of water?
26. Why do noble gases exist as mono atomic molecules?

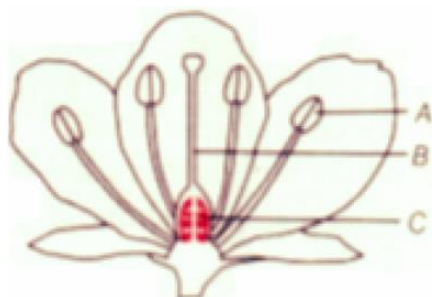
Section C

27. There are 3 unknown metals - A, B and C. C displaces B from its oxide while with oxide of A, there is no reaction. Give the reactivity order of A, B and C.
28. If all the waste we generate is biodegradable, will this have no impact on the environment?
29. Differentiate between virtual image formed by a concave mirror and of a convex mirror.

OR

Distinguish between real image and virtual image.

30. How to destarch the leaves for an experiment to show that sunlight is necessary for photosynthesis?
31.
 - i. State two main causes of a person developing near-sightedness. With the help of a ray diagram, suggest how he can be helped to overcome his disability?
 - ii. The far point of myopic person is 100 cm in front of the eye. Calculate the focal length and power of a lens required to enable him to see distant objects clearly.
32. Name the parts A, B and C shown in the following diagram and state one function of each.



OR

Name one sexually transmitted disease each caused due to bacterial infected and viral infection. How can these prevented?

33. Find the direction of magnetic field due to a current carrying circular coil held:
 - i. Vertically in North-South plane and an observer looking it from East sees the current to flow in anti-clockwise direction.
 - ii. Vertically in East-West plane and an observer looking it from South sees the current to flow in anti-clockwise direction.

- iii. Horizontally and an observer looking at it from below and see the current flowing in clockwise direction.

Section D

34.

- i. What is meant by pH?
- ii. Water is a neutral substance. What colour will you get when you add a few drops of universal indicator to a test tube containing distilled water?
- iii. Two solutions A and B have pH values of 3.0 and 9.5, respectively. Which of these will turn litmus solution from blue to red and which will turn phenolphthalein from colourless to pink?

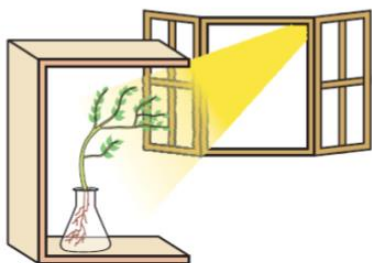
OR

In one of the industrial processes used for manufacture of sodium hydroxide, a gas X is formed as by-product. The gas X reacts with lime water to give a compound Y which is used as a bleaching agent in chemical industry. Identify X and Y giving the chemical equations of the reactions involved.

35. Some situations in our day to day life require quick response from our body. Illustrate the sentence with the help of suitable diagram and common examples.

OR

The image shows phototropism in the plant stem.



Using the given image, answer the following questions:

- i. Which plant hormone is responsible for the bending of the stem towards the light?
 - ii. Where is this hormone present in the plant?
 - iii. What makes the stem bend towards the light?
 - iv. Why such movement of plant stem is called positive tropism?
 - v. Which part of the plant shows negative phototropism?
36. Describe the activity that shows that a current-carrying conductor experiences a force perpendicular to its length and the external magnetic field. How does Fleming's left-hand rule help us to find the direction of the force acting on the current-carrying conductor?

Section E

37. **Read the text carefully and answer the questions:**

Pea plants can have smooth seeds or wrinkled seeds. One of the phenotypes is completely dominant over the other. A farmer decides to pollinate one flower of a plant with smooth seeds using pollen from a plant with wrinkled seeds. The resulting pea pod has all smooth seeds.

- i. Which crosses will give smooth and wrinkled seeds in the same proportion?
- ii. Which cross can be used to determine the genotype of a plant with a dominant phenotype?

OR

On the crossing of two heterozygous smooth seeded plants (Rr), a total of 1000 plants were obtained in F_1 generation. What will be the respective number of smooth and wrinkled seeds obtained in F_1 generation?

38. **Read the text carefully and answer the questions:**

We know that a battery or a cell is a source of electrical energy. The chemical reaction within the cell generates the potential difference between its two terminals that sets the electrons in motion to flow the current through a resistor or a system of resistors connected to the battery. To maintain the current, the source has to keep expanding its energy. Where does this energy go? A part of the source energy in maintaining the current may be consumed for useful work (like in rotating the blades of an electric fan). The rest of the source energy may be expended in heat to raise the temperature of the gadget. We often observe this in our everyday life. For example, an electric fan becomes warm if used continuously for a long time, etc. On the other hand, if the electric circuit is purely resistive, that is, a configuration of resistors only connected to a battery; the source energy continually gets dissipated entirely in the form of heat. This is known as the heating effect of electric current. This effect is utilized in devices such as an electric heater, electric iron, etc.



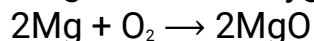
- i. Explain Joule's heating law.
- ii. In practical situations, when an electric appliance is connected to a known voltage source, then how does the heating effect of electric current can be calculated?
- iii. Write the relation between heat energy produced in a conductor when a potential difference V is applied across its terminals and a current I flows through for t .

OR

Two identical wires one of nichrome and the other of copper are connected in series and a current (I) is passed through them. State the change observed in the temperatures of the two wires.

39. **Read the text carefully and answer the questions:**

In a balanced chemical reaction, equal number of atoms are present on both sides of reaction. A balanced chemical reaction is based on law of conservation of mass which means that total mass of reactants and products participating in a reaction must be equal. For example, a balanced chemical equation of burning of magnesium in oxygen to form magnesium oxide is written as:

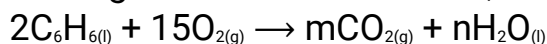


The mass of reactants ($2 \times 24 + 32 = 80$) is equal to the mass of products [$2 \times (24 + 16) = 80$].

- In a reaction, 35 g of reactant, PQ breaks down into 20 g of product, P and an unknown amount of product, Q. Find the amount of product Q.
- The solid mercury (II) oxide is heated, and liquid mercury and oxygen gas are produced. Mention balanced chemical reaction.
- Which laws are satisfied by a balanced chemical equation?

OR

In the given chemical reaction,



Find the values of m and n respectively.

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Solution

Section A

1. (d) Decomposition reaction

Explanation: Ferrous sulphate crystals contain water molecules ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$). On heating, ferrous sulphate crystals lose water and anhydrous ferrous sulphate (FeSO_4) is formed. So their colour changes from light green to white.

On further heating, anhydrous ferrous sulphate decomposes to form ferric oxide (Fe_2O_3), sulphur dioxide (SO_2) and sulphur trioxide (SO_3). So, the gas emitted smells like burning sulphur.

In this reaction, the single reactant FeSO_4 decomposes to form three different products. So, the reaction is a decomposition reaction.

2. (b) Statement B is true. Statement A is false.

Explanation: Most metals form basic oxides. However, some metals like aluminium and zinc, are amphoteric and form basic as well as acidic oxides. Non-metals react with oxygen to form acidic oxides or neutral oxides. E.g. Hydrogen forms a neutral oxide - H_2O .

3. (d) Progesterone

Explanation: Progesterone hormone is released during parturition that creates uterine contraction like the situation that cause labour pain.

4. (a) round and green

Explanation: Since roundness and green colour are shown by capital letters in the

genotype so they are dominant traits. We know that only dominant traits are expressed in F_1 generation.

5. (d) Black absorbs all the colours

Explanation: Black absorbs all the colours

6. (c) Micropropagation

Explanation: The propagation of plants by growing plantlets in tissue culture and then planting them out.

7.

$$(c) \frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

Explanation: $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

- 8.(d) B

Explanation: Sunlight is not available to the covered portion, hence no starch remains white after starch test.

9. (c) Auxin

Explanation: Auxins are a powerful growth hormone produced naturally by plants. They are found in shoot and root tips and promote cell division, stem, and root growth.

10. (c) C

Explanation: Buds appear as protuberance. In C all the cells are separate and single.

11. (c) Pituitary

Explanation: The **hypothalamus** is known as the master switchboard of our body because it controls the endocrine system. The pituitary gland, which hangs by a thin stalk from the **hypothalamus**, is called the master gland of the **body** because it regulates the activity of the endocrine glands.

12. (a) Iodine

Explanation: Lustre means to shine. Shining metals are also called lustrous metal. For example, gold. Non-metals such as sulphur, oxygen, nitrogen are non-lustrous but iodine is a greyish black solid and crystals have a metallic lustre.

13. (d) D

Explanation: It shows binary fission in Amoeba.

14. (c) (ii) and (iv)

Explanation: Carbon compounds are usually poor conductors of heat and electricity. Carbon compounds are covalent compounds that have been formed by the sharing of electrons. They do not have strong forces of attraction between their molecules. They have weak interactions between their molecules. This leads to low melting points and boiling points.

15. (a) Non-luminous flame

Explanation: Alcohol produces a non-luminous flame. Since it burns with a clear flame and gives out a lot of heat, it is used as a fuel. The parent hydrocarbon of alcohol is alkane (which has single C-C bonds).

16. (b) (ii) and (iv)

Explanation: Sublimation of dry ice and evaporation of water both are endothermic processes. These processes pull heat (energy) from their surroundings to change from one state to another. Hence both these processes produce cooling rather than heating. Dry ice absorbs heat from the environment to convert into gas. This feature

makes it a good refrigerant. Processes of dilution of sulphuric acid and condensation of water vapours produce a large amount of heat. That is why these are exothermic processes.

17. (d) A is false but R is true.

Explanation: Baking soda, being alkaline, neutralises the acidity in the stomach and removes it.

18. (c) A is true but R is false.

Explanation: Ohm's law states that the electric current flowing through a metallic wire is directly proportional to the potential difference across its two ends. The expression is written as:

$$V = IR$$

Here R (resistance of the wire) is constant value then only the statement will be valid.

$$V \propto I \text{ only if } \frac{V}{I} = \text{constant}$$

19. (d) A is false but R is true.

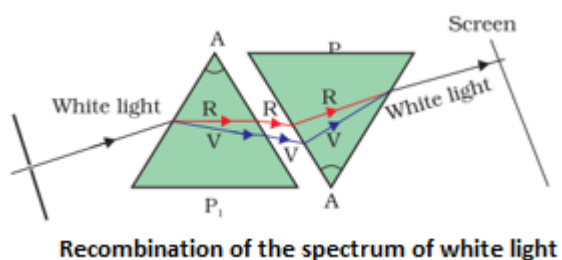
Explanation: Bile helps in the emulsification of fats whereas lipases are the enzymes which hydrolyze fats and oils.

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

Explanation: When a piece of copper metal is added to dilute sulphuric acid, the solution turns blue. It is because copper reacts with dilute sulphuric acid to form blue copper (II) sulphate solution.

Section B

21. For this experiment, one prism is placed near another prism so that one prism is in erect position that is base placed downwards and another one is in inverted position (apex downwards) as shown in the diagram below. When ray of white light enters the first prism, dispersion of light takes place into a 7 colour band and When lights of different colours pass through the second prism, they recombine to make a ray of white light.



OR

Had it become solid, its focal length would have been fixed. We would not have been able to focus objects lying at different distances. In short, accommodation of eye would have been reduced to zero.

22. Decomposers release their enzymes into dead and decaying plants and animal remains and absorb the simple inorganic substances.
23. Convex mirror is preferred as rearview mirror in vehicles because it always forms virtual erect and diminished image. It also covers the wider field of view.

24. During smoking, the cigarette fumes make the walls of alveoli very thin which causes rupturing of alveoli. This reduces the surface area for gaseous exchange in lungs. To make up for the reduced gaseous exchange, the heart has to pump more blood. This over burdening of the heart may cause heart failure. Carcinogenic substance in the smoke can also lead to lung cancer.
25. The acid behavior of acid is due to the presence of hydrogen ions. The acids will not show its acidic behavior in the absence of water, this is because the acids produce hydrogen ions only in the presence of water.
26. Noble gases have stable electronic configuration. Atoms of these elements cannot lose or gain or share electrons with other atoms. As a result, noble gases exist as monatomic molecules, i.e. they exist as free atoms, eg., He, Ne, Ar, Kr, Xe and Rn.

Section C

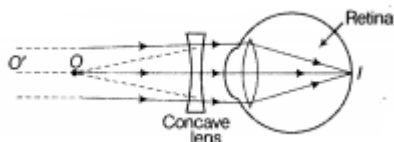
27. C displaces B from its oxide, therefore, C is more reactive than B. There is no reaction when C is treated with oxide of A or C does not displace A from its oxide. So, A is more reactive than C. Thus, the reactivity order is $B < C < A$.
28. If all the waste we generate is biodegradable, it will still can have an impact on the environment. Biodegradable wastes pollute the environment only when the amount is large, which takes a long time to get decomposed into harmless substances. Also open decomposition of biodegradable waste leads to formation of methane gas, which is the green house gas. Accumulation of biodegradable waste also leads to breeding of houseflies & mosquitoes which are the vectors of diseases. Thus, the impact on the environment will depend upon the system of collecting, transporting and disposal of biodegradable waste.
29. The virtual image formed by a concave mirror is always magnified whereas the virtual image formed by a convex mirror is diminished.

OR

Real Image	Virtual Image
1. It is formed by the actual meeting of reflected (or refracted) ray.	1. It is formed when reflected (or refracted) rays appear to meet when produced backward
2. It can be obtained on the screen.	2. It cannot be obtained on the screen.
3. It is always inverted.	3. It is always erect.
4. It is formed by concave mirror or convex lens.	4. It is formed by concave, convex and plane mirror (or concave and convex lens.)

30. Destarching occurs when part of a plant is "deprived of starch, as by translocation". It is also the process of eliminating starch reserves in a plant for experiments concerning photosynthesis. This is done by leaving the plant in a dark place for a long period of time.
- 31.
- Near sightedness (myopia) defect arises either because of :
 - decrease in focal length of eye lens.
 - elongation of the eye ball
 - To correct this defect of vision, he must use a concave lens of suitable focal length. The concave lens of suitable focal length will bring the image back to

the retina as shown in the given figure.



iii.

Given, $v = -100 \text{ cm}$, $u = \infty$

Using lens formula,

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Rightarrow \frac{1}{-100} - \frac{1}{\infty} = \frac{1}{f}$$

$$f = -100 \text{ cm} = -1 \text{ m.}$$

\therefore Power of lens,

$$P = \frac{1}{f(m)} = \frac{1}{-1} = -1\text{D.}$$

32.

Part	Function
A- Anther	Formation of pollen grains and storing it till pollination starts.
B- style	Connecting stigma to ovary. Where pollen grains stuck to stigma, grows it's pollen tube to facilitate the movement of 2 male gametes.
C- Ovary	Contains ovule which develop into seeds after fertilization of male and female gamete, while ovary forms the fruit.

OR

Sexually transmitted disease caused due to

1. Bacterial infection is gonorrhoea, and
2. Viral infection is AIDS (Acquired Immune Deficiency syndrome). These disease can be prevented by responsible sexual behaviour such as use of condom during intercourse, etc.

33.

- i. When the coil is kept vertically in North-South plane and the current is flowing in the anti-clockwise direction through the loop, then the magnetic field is in the East-West direction.
- ii. When the coil is kept vertically in East-West plane and current through the coil is in the anti-clockwise direction, then the magnetic field is in the South-North direction.
- iii. In this case, the direction of the field for the observer positioned below the coil is in the downward direction.

Section D

34.

- i. The p in pH stands for "**potenz**" which means **power** in German. pH is a number which indicates the acidic or basic nature of a solution.
- ii. Water will turn universal indicator solution green as its pH value is 7.

- iii. As the pH value of solution A is 3.0, i.e. acidic in nature hence, it turns litmus solution from blue to red and phenolphthalein indicator in basic medium change its color to pink.

OR

In the manufacture of sodium hydroxide (Chlor-alkali process), hydrogen gas and chlorine gas are formed as by-products. The chemical equation for the reaction is as follows:-

$2NaCl(aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2(g) + H_2(g)$ Gas 'X', which is formed as by-product and which also reacts with lime water (calcium hydroxide) to form calcium oxy-chloride is thus, chlorine. Gas X is not hydrogen. Calcium oxy-chloride is used as a bleaching agent in the chemical industry. The chemical equation for the formation of calcium oxy-chloride is as follows:-

$Ca(OH)_2(s) + Cl_2(g) \rightarrow CaOCl_2(s) + H_2O(l)$ Therefore, gas 'X' is **chlorine gas** (Cl₂) and 'Y' is **calcium oxy-chloride** (bleaching powder).

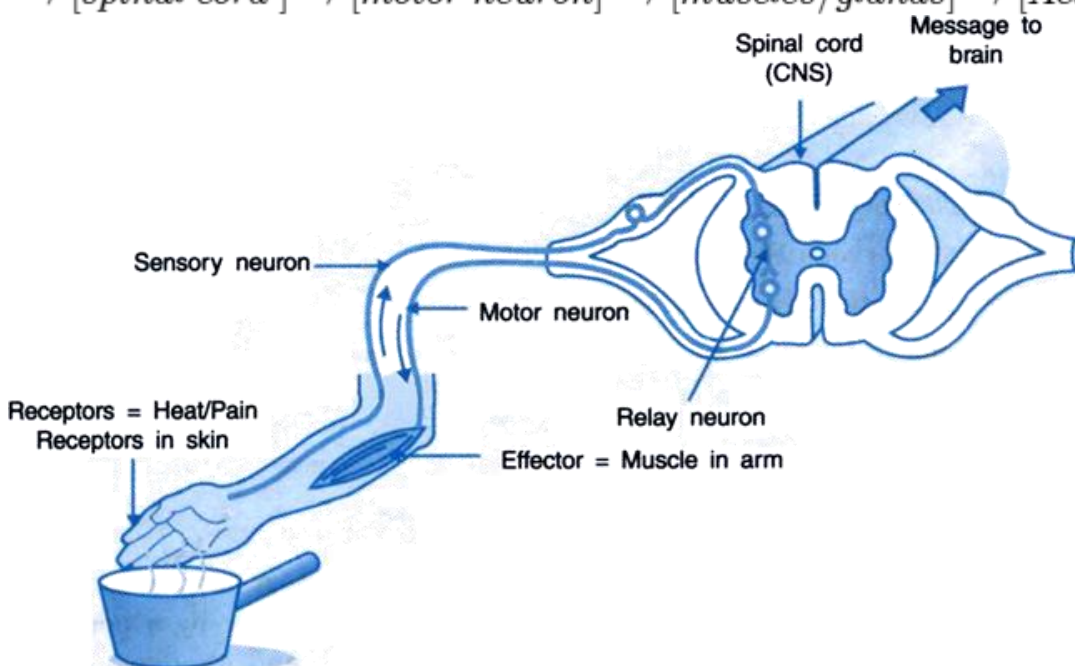
35. **Reflex action** is a rapid (unconscious), automatic and involuntary response of effectors, i.e. muscles and glands, to a stimulus, which is monitored through the spinal cord. It is a simple form of behavior in which the same stimulus produces the same response every time, e.g.

- i. If we unknowingly touch a hot plate, we immediately move our hand away from it.
- ii. Moving our foot away on stepping something sharp.

Other examples are knee jerk, coughing, yawning, sneezing, etc.

The pathway taken by nerve impulse in a reflex action (called the reflex arc) is given as follows:

[Stimulus] → [Receptor/organ] → [sensory neuron] → [spinal cord] → [motor neuron] → [muscles/glands] → [Action/response]



Reflex arcs have evolved in animals because the thinking process of the brain was

not fast enough during the early stages of evolution. However, even after complex neuron networks have come into existence, reflex arc continues to be more efficient for quick responses.

OR

- i. The plant hormone **auxin** is responsible for the bending of the stem towards the light.
- ii. The auxin hormone is present at the tip of the stem of the growing plant.
- iii. Auxin prefers to stay in shade away from light so when sunlight falls on the stem from one side, it gets concentrated on the opposite side. Due to more auxin, the shady side of the stem grows to be longer than the side of the stem which is facing the light and makes the stem bend towards the light.
- iv. The movement of a plant part towards light is called positive phototropism. The stem of the growing bends towards the light so it is called positive phototropism.
- v. The roots of a plant move away from light so they show negative phototropism.

36. The activity to demonstrate that a current-carrying conductor experiences a force perpendicular to its length and the external magnetic field can be explained as follows:

Activity: To show the effect of magnetic field on a current-carrying conductor
Materials Required: For this, we need to take a small aluminum rod, a horseshoe magnet, battery, plug key, wires, and a stand.

- i. Suspend an aluminum rod horizontally from the stand and two wires at the ends of it are tied. The wires are connected to a Rheostat, battery and a key so that a circuit is completed,
- ii. Place a horseshoe magnet in such a manner that the aluminum rod is between the poles of a magnet.

Assume that the above the aluminum rod is South pole of the magnet and below, the north pole of the magnet. Insert the plug key and current is supplied to the rod.

Observation: the aluminum rod is deflected towards the left direction

On changing the direction of the current, the rod is deflection in the right direction.

Hence, it demonstrates that a current-carrying conductor experiences a force perpendicular to its length and the external magnetic field

The direction of the magnetic field can find out with the help of Fleming's left-hand rule. Let current is moving in an anticlockwise direction, then the direction of the magnetic field will be in clockwise direction i.e. at the top of the loop whereas vice-versa in case of the clockwise direction of the current.

Section E

37.

- i. $Rr \times rr$
- ii. $Rr \times rr$

OR

The crossing between two heterozygous smooth seeded (Rr) plants would give phenotypic ratio of 3 smooth seeded plant: 1 wrinkled seeded plant. If plants obtained were 1000, then the number of smooth and wrinkled plants will be closed to 750 and 250 respectively.

38.

- i. The law implies that heat produced in a resistor is
 - a. directly proportional to the square of current for a given resistance,
 - b. directly proportional to resistance for a given current, and
 - c. directly proportional to the time for which the current flows through the resistor.
- ii. Firstly, we calculate the current flowing through it, using the relation $I = \frac{V}{R}$. Then we apply the formula $H = I^2Rt$ to calculate the heating effect.
- iii. Heat produced, $H = VIt$

OR

The resistivity of nichrome is more than that of copper so its resistance is also high. Therefore, a large amount of heat is produced in the nichrome wire for the same current as compared to that of copper wire.

39.

- i.

PQ	\longrightarrow	$P + Q$
35 g		$20\text{g} + ?$

According to law of conservation of mass,
 Mass of PQ = Mass of P + Mass of Q
 \therefore Mass of Q = (35 - 20)g = 15 g
- ii. 2 moles of mercury (II) oxide produce 2 moles of mercury and one mole of oxygen gas.
 $2\text{HgO}_{(s)} \longrightarrow 2\text{Hg}_{(l)} + \text{O}_{2(g)}$
- iii. The law of conservation of mass is satisfied by a balanced chemical equation.

OR

12 and 6