CBSE Class 10 Science Sample Paper Solution

Section A

1. What are oxidation and reduction reactions? **[1]**

Answer 1: Oxidation is a type of chemical reaction where there is a gain of oxygen or loss of hydrogen while reduction involved loss of oxygen or gain of hydrogen.

2. What happens when an acid reacts with a metal? **[1]**

Answer 2: When an acid reacts with a metal, hydrogen gas is usually released and a salt compound is formed.

Section B

3. Write the equation for the chemical reaction: Hydrogen + Chlorine → Hydrogen chloride. State whether it is a balanced equation or not?
[2]

Answer 3:

$$H_2 + Cl_2 \rightarrow 2HCl$$

The 2 in front of HCl indicates that the equation is balanced.

OR

What are covalent Bonds? Name an element which forms such type of bond with itself and other elements?

Answer: Bonds that are formed by the sharing of electrons between two atoms are known as covalent bonds. Carbon can form covalent bonds with itself and other elements like hydrogen, nitrogen, oxygen and others.

4. State a reason why rainwater is a good conductor of electricity while distilled water is a bad conductor of electricity? **[2]**

Answer 4: Due to the presence of dissolved salts and ios rainwater is a good conductor of electricity whereas distilled water does not contain ions.

OR

Name one characteristic of metals that allow it to be easily flattened into thin sheets. Give an example of such metals.

Answer: Malleability is one physical property of metals that allow it to be shaped into thin sheets. Gold and Silver are some examples of metals having high malleability.

5. Discuss the importance of Darwin's theory of evolution and Mendel's Experiment? **[2]**

Answer 5: Darwin's theory which covers the topic of evolution explains how life on earth evolves from simple to more complex forms while Mendel's experiment talks about how certain traits are inherited from one generation to the next.

Section C

6. List three general characteristics of ionic compounds. **[3]**

Answer 6: The three characteristics are;

- They are hard but brittle and tend to break easily when pressure is applied.
- They have high boiling and melting points.
- Ionic compounds when in molten state conduct electricity as a result of free moving ions.

OR

State three reasons why DNA copying is important in the process of reproduction.

Answer: The reasons are;

- DNA copying makes sure that certain characteristics of the parents are transferred to their offspring.
- DNA copying is necessary for variations.
- DNA copying leads to the creation of an additional cellular apparatus.

7. a. Define electric current and describe how it is transferred from one point to another.

b. Also, name the SI unit and device for measuring electric current. **[3]**

Answer 7: a. The flow of electric charge across a certain surface or a circuit is known as electric current. It is carried or transferred by electrons.

b. The SI unit is ampere and the device used for measuring current is an ammeter.

8. State the functions of the following; **[3]**
   a. Neurons b. Receptors c. Vertebral column

Answer 8:

a. Neurons carry information via electrical impulses from one part of the body to another.

b. Receptors are located in our sense organs and help in detecting information like smell, taste etc.

C. Vertebral column also known as backbone protects the spinal cord.

9. State Dobereiner's Law of Triads? Given two limitations of Dobereiner's classification? **[3]**

Answer 9: Dobereiner's Law of Triad states that when three elements are put together or arranged in the order of increasing atomic masses in a triad, the weight of the middle element is taken as the arithmetic mean of the atomic masses for the other two elements. The two limitations of his law are;

- Not all existing or known elements could be grouped in the form of triads.
- Some of the groups like the nitrogen family did not obey Dobereiner's classification.

10. Explain the strategies used by plants for excretion. **[3]**

Answer 10: Some of the strategies used by plants for excretion are;

- They can get rid of excess water by transpiration.
- By losing some parts such as leaves which are considered as dead cells.
- Waste products are stored as resins and gums.
- Oxygen and Carbon dioxide which are sometimes considered as waste are released via photosynthesis.

11. State three properties of magnetic field lines. **[3]**

Answer 11: The three properties of magnetic field lines are;

- Magnetic field lines always start from the north pole and end on the south pole.
- It is a vector quantity and two magnetic field lines never intersect each other.
- Magnetic field lines always form closed loops.

12. Name three energy sources that are renewable along with suitable reasons for your choice. **[3]**

Answer 12: The three renewable sources of energy are;

- Biomass energy from organic matter and waste products. Wood is one form of biomass energy which is easily renewable.

- Solar Energy. The sun is said to have a long life span and thus offers an unlimited supply of solar energy.
- Wind Energy. Air is always present around us and is continuously moving from place to place. The power of the moving wind can be captured and converted into energy.

13. Find the focal length of a spherical mirror when its radius of curvature is;
    a. 30cm **[3]**

Answer13: When the radius of curvature = 30cm.

Taking the formula

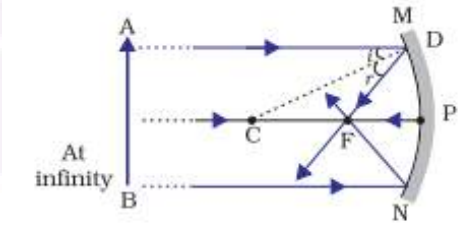
$$f = \frac{R}{2}$$

$$f = \frac{30}{2}$$

f = 15 cm.

OR

Draw a diagram for the formation of an image by a concave mirror when the object is placed at infinity.



Answer:

14. State three ways in which non-biodegradable substances are dangerous to the environment.

Answer 14: The three ways are;

- They are the main source of pollution and contamination.

- Causes bio magnifications in the soil and aquatic ecosystem.
- Death of animals.

15. Explain the term Power of Accommodation of the eye.

Answer 15: Usually the ciliary muscles in the eye either contract or expand resulting in the modification of the curvature which in turn leads to changes in the focal length of the eye. In short, the ability of the eye lens to adjust its focal length is known as accommodation.

Section D

16. Explain the terms rusting and corrosion. Give three ways to prevent corrosion or rusting. **[5]**

Answer 16: When materials deteriorate due to the action of chemical, electrochemical or other reactions it is known as corrosion whereas rusting is a chemical process which leads to the formation of red or orange coating on the surface of metals when exposed to water or air for a long time.

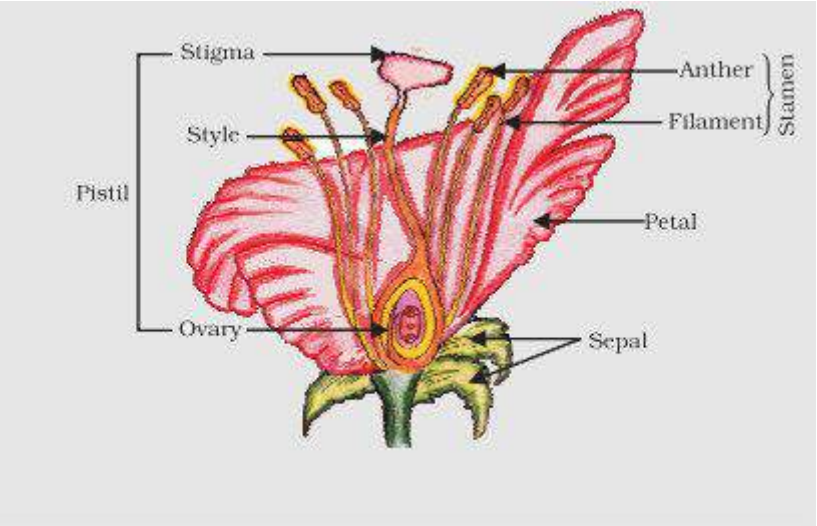
Some of the ways to prevent rusting and corrosion are;

- Galvanisation which is a method of coating iron or other metals with a thin layer of zinc.
- Anodising or making alloys helps in changing the properties of metal thus leading to better resistance to rust and corrosion.
- Rusting can also be prevented by oiling, greasing, painting, chrome plating.

OR

Draw a diagram representing the longitudinal section of a flower.

Answer:



17. Briefly describe the process of tissue culture and state its importance. **[5]**

Answer 17: In the process of tissue culture, new plants can be grown by separating the cells or tissues of a plant. It is usually done from the tip of the plant.

- The cells are kept in an artificial medium to facilitate cell division which also leads to the formation of callus.
- The callus is kept in another medium where growth hormones are added.
- The plant is then put inside the soil and develop into mature plants.

One of the main important uses of tissue culture is that it helps in growing several plants at a time from one single plant. It is used in the growth of ornamental plants.

18. A concave lens has a focal length of 10 cm. At what distance should

the object from the lens be placed so that it forms an image at 5 cm

from the lens?

Answer 18: A concave lens always forms a virtual, erect image on the same side of the object.

Image-distance v = -5 cm

Focal length f = -10 cm

Object-distance u = ?

As per the formula;

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

We get,

$$\frac{1}{u} = \frac{1}{v} - \frac{1}{f}$$

$$\frac{1}{u} = \frac{1}{-5} - \frac{1}{(-10)}$$

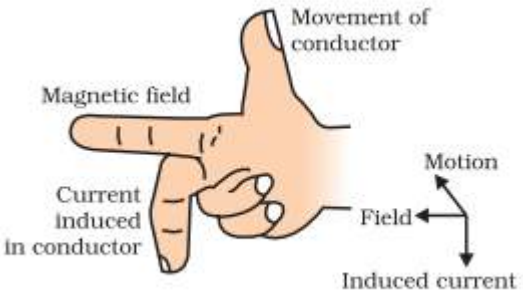
$$\frac{1}{u} = -\frac{1}{5} + \frac{1}{10}$$

Therefore u = -10 cm

The distance of the object will be = 10 cm.

19. State Fleming's left-hand rule and describe what the rule is used for. Also, represent it in a diagram. **[5]**

Answer 19: If we describe Fleming's left-hand rule it states that if we extend our thumb, the first finger and the middle finger on our left hand in a mutually perpendicular manner, the thumb points towards the direction of the force or motion, the middle finger gives the direction of magnetic field while the third finger shows the flow of the current. This rule is mostly used in determining the direction of the force on a current carrying conductor placed in a magnetic field.



20. What do you mean by trophic level? Give an example food chain describing the different trophic levels that are present in it. **[5]**

Answer 20: In simple terms, the trophic level is said to be the position of the

organism in the food chain. Here in this functional state, there is a sequential transfer of food and energy from one level to another. There are five trophic levels in an ecosystem. Here is an example to describe the levels.

- Green plants - Level one - producers.
- Insects - Level two - Primary consumers or Herbivores.
- Lizard - Level three - Secondary consumers
- Eagle - Level Four - Tertiary consumers - Carnivores.
- Decomposers

21. In your own words state the reasons for the need to manage our resources. **[5]**

Answer 21: Some of the main reasons are;

- Increase in human population and demand.
- Resources are finite and sometimes non-replenishable.
- Resources last for a longer period of time.
- Prevention of natural calamities.
- Better quality of life.

Section E

22. Examine a person having a myopic defect in his/her vision and is not able to see objects beyond 2 m clearly. Suggest the type of corrective lens that can be used to correct the vision? **[2]**

Answer 22: The person with this defect will be short-sighted. This defect can be corrected by using a concave lens of suitable power. The lens will help in the formation of the image on the retina giving a clear vision of the object.

OR

23. Observe a plant and explain in simple terms how the process of transportation of materials occur in plants. **[2]**

Answers 23: Raw materials present in soil are transferred from the roots. Normally, materials transported through tissues known as xylem and phloem which connect different parts of the plant.

24. You are given two solutions, X and Y where the pH of solution Y is 4 and the pH of solution Y is 9. Name the solution having a higher concentration of hydrogen ion. Also, state whether X and Y are basic or acidic.
[2]

Answer 24: Solution X contains a higher concentration of hydrogen ion. Since the pH of a neutral solution is taken to be 7 (universal indicator) X is acidic while Y is basic as the pH level is higher than 7.

OR

What happens when metal is burned in air? Give an example.

Answer: When metals are burnt in the air they usually combine with oxygen to form a compound of metal oxides. For example, when copper is burnt in the presence of oxygen it forms copper oxide generally black in colour.

25. We use soaps in our day to day life. Can you describe the mechanism of the cleaning action of soaps? **[2]**

Answer 25: Soap is a chemical product which consists of two main groups known as hydrophobic and hydrophilic groups which are present in its molecules. When we take soap and mix it with water then these two groups come into play and leads to what is known as Micelle formation. This further leads to leather formation resulting in dirt particles mixing with water which ultimately results in the removal of the dirt particles.

26. Take a broken down electric iron and open it to reveal different parts. Here, one thing you will notice is that the coil of the iron is made of an alloy. Can you give reasons as to why an alloy is used? **[2]**

Answer 26: An alloy is used in the coil of electric irons because an alloy usually has a higher resistivity than pure metal and are able to restrict the flow of electric current while generating heat. The alloys also have higher melting points.

OR

Have a look at the elements in the periodic table under the third period and classify them as metals and non-metals.

Answer: The elements in the third period are Na, Mg, Al, Si, P, S, Cl and Ar. Out of these Na, Mg and Al belong to the category of metals. Element Si is a metalloid. Similarly, P, S, Cl are classified as non-metals. The element Ar belongs to the category of inert gas.

27. Grab a spoon and use it as a mirror to view your face on the curved surface at a distance beyond the focal point. Observe the image formed and explain the changes. **[2]**

Answer 27: The image formed is inverted. This is because the curved part of the spoon generally represents a curved or concave mirror where the light rays are reflected in a different manner. Since we are standing beyond the focal point the image appears inverted.