

**Mizoram Board
Class X Science
Sample Paper 1 – Solution**

1. (ii) Excess carbohydrate in animals is stored in the form of glycogen which serves as an energy reserve.
2. (ii) Gustatory receptors are specialized nerve cells found in tongue.
3. (ii) With the help of tissue culture a new organism can be grown with the help of a single cell in a nutritive medium.
4. (iii) Some farmers wanted to select for arrested flower development, and have bred broccoli.
5. (iii) The ozone blanket is composed of a high concentration of ozone about 18-26 km above in the stratosphere.
6. (i) Fluorine is most non-metallic among F, Cl, Br and At. This is because metallic character decreases across a period and increases down a group.
7. (i) Alkaline potassium permanganate is used for oxidising alcohols to acids.
8. (iii) Electrolytic refining means refining by electrolysis. Metals like copper, zinc, tin, lead, chromium, nickel, silver and gold are refined electrolytically.
9. (iii) Antacids are bases; they do not contain any acids.
10. (iii) Silver is less reactive than lead, so there will be no displacement reaction.
11. (ii) According to the rules to trace the image, if the ray of light proceeds parallel to the principal axis then, after reflection, it passes through the principal focus
12. (ii) Cataract is a defect which occurs due to formation of an opaque or cloudy membrane over eye lens which can be cured only by surgery.
13. (i) The unit of electric power or electrical energy consumed in our houses is kWh.
14. (i) Use the right-hand rule. Point your thumb down. Your fingers curl toward the south when you look on the east side of the wire.

- 15.** Transmitting electricity is more efficient and economical than transporting coal or petroleum over same distance.
- 16.** Commutator rings of the coil helps to reverse the direction of current flowing through the coil after every half rotation of the coil.
- 17.** The name given to aqueous solution of sodium chloride is brine.
- 18.** Calcium floats on water because the bubbles of hydrogen gas formed by the reaction of calcium with water stick to the surface of metal.
- 19.** Plastic items are isolated from the garbage and sent for recycling where they are melted and remolded into various plastic items.
- 20.** Variation refers to the number of changes that appear among the same members of species and their offspring as a result of genetic recombination.
- 21.** In males vas deferens is blocked so that the transfer of sperms can be prevented.
- 22.** On heating, saturated hydrocarbons give a clean flame, whereas unsaturated hydrocarbons give a yellow flame with lots of black smoke
- 23.** The element is in second group. Thus, its valency is 2.
Oxygen has a valency of -2 in its oxides. Thus, the formula of element Z oxide is ZO.

Or

The continuous discovery of new elements and their compounds led to confusions. It became difficult to study, remember and recall the properties of all the elements. Thus, the need to classify and place them in certain groups was felt.

- 24.** Fuels such as coal and petroleum have some amount of nitrogen and sulphur in them. Their combustion results in the formation of oxides of sulphur and nitrogen which are major pollutants in the environment.
- 25.** Natural resources are misused by people for their own selfish goals and motives. For example, these goals can be in the form of requirement of land that causes irrational cutting of trees or need of raw material which results in destruction of biodiversity to get only specific products.

- 26.** The main difference between fission and fragmentation is that in fission, a unicellular organism breaks up to form two daughter organisms whereas in fragmentation, a multicellular organism breaks up into various fragments and each fragment develops into a complete organism.
- 27.** Feather provided insulation to dinosaurs in cold weather. Later in the evolutionary process, feathers were used for flight in birds. Because dinosaurs were reptiles, it means that birds are closely related to reptiles.
- 28.** The energy consumed by an electric circuit to flow current through it is referred as electrical energy. This energy is provided by the battery to every electric charge. The work required to keep the charge Q in motion by the battery of voltage V is

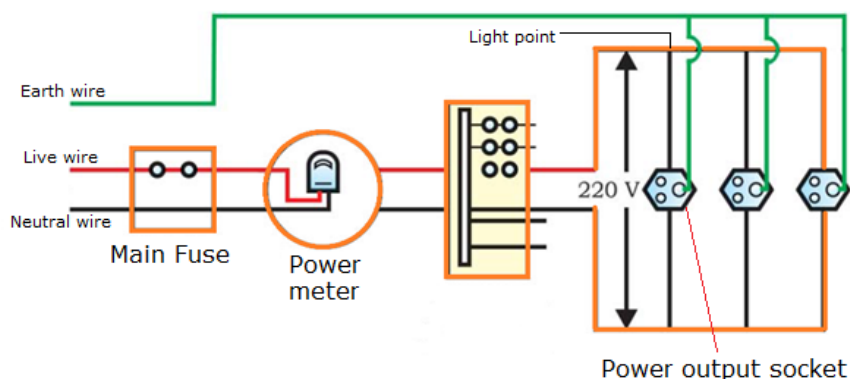
$$W = VQ$$
 From the definition of electric current,

$$Q = It$$
 Therefore, $W = VIt$
- According to Ohm's law, $V = IR$
 Therefore, $W = (IR) It$
 Or, $W = I^2Rt$
- Thus, the current flowing through the resistor R for time t is I , the electrical energy consumed to is W which is converted into heat energy.
- 29.** The refractive index of second medium with respect to first medium is defined as the ratio of the sine of angle of incidence in the first medium to the sine of the angle of refraction in the second medium.

Refractive index of a medium is always greater than 1 (it cannot be less than 1) because the speed of light in any medium is always less than that in vacuum.

30.

(a) Domestic wiring circuit:



(b) The on/off switch of the mains is connected to the live wire.

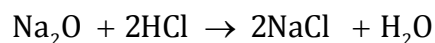
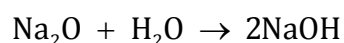
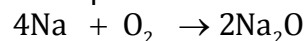
31.

- (a) Test the three solutions with blue litmus paper; one solution will change blue litmus red. This solution is acidic.
- (b) Test the remaining two solutions with the red litmus paper [which changed in activity (a)]; one solution will change it again to blue. This solution is basic.
- (c) So, the third solution is distilled water.

Or

It is a metal.

Example:



32. Biomagnification is the increasing concentration of a substance, such as a toxic chemical, in the tissues of organisms at successively higher levels in a food chain.

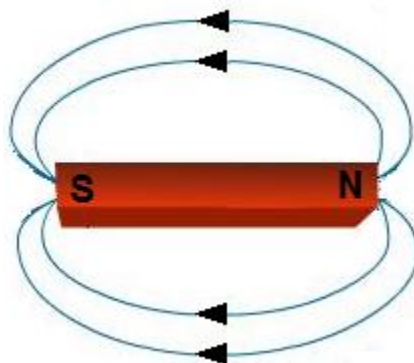
In the food chain,

Grass ----> Grasshopper ----> Frog ----> Snake ----> Peacock

Peacock occurs at the highest trophic level (on the extreme right); therefore, it will have the maximum concentration of harmful chemicals in its body.

33.

- (a) The space around a magnet in which the force of attraction and repulsion due to the magnet can be detected is called the magnetic field. The direction of the magnetic field is taken to be the direction in which a North Pole of the compass needle moves inside it.
- (b) Magnetic field lines around a magnet:



(c) Properties of magnetic field lines:

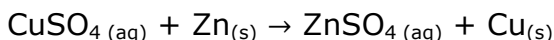
- (i) Field lines originate from the North Pole and end at the South Pole.
- (ii) Magnetic field lines come closer to one another near the poles of a magnet, but they are widely separated at other places.
- (iii) Field lines do not intersect each other.

34.

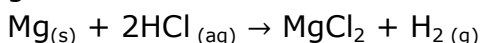
- (a) When we enter a darkened room from bright sunlight, we are unable to see at first. This is because the size of the pupil is small. When we enter the dark room, the pupil expands and more light enters the eye enabling us to see.
- (b) The iris controls the size of the pupil. So, when our eye encounters bright light, the iris contracts the pupil and protects the retina from damage.
- (c) A person is wearing spectacles of power +1.5 D. So, the lens has a positive focal length which indicates that he is wearing a convex lens. Hence, he is suffering from hypermetropia or long-sightedness. For a person wearing spectacles of power –1.5 D, the lens has a negative focal length which indicates that he is wearing a concave lens. Hence, he is suffering from myopia or short-sightedness.

35.

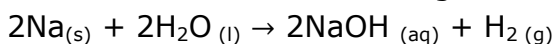
- (a) Zinc reacts with copper sulphate to give zinc sulphate and copper metal.



- (b) Magnesium reacts with HCl to give magnesium chloride and hydrogen gas.



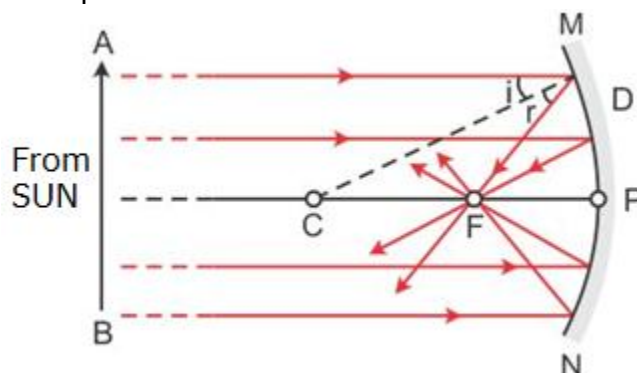
- (c) Sodium reacts with water to give sodium hydroxide and hydrogen gas.



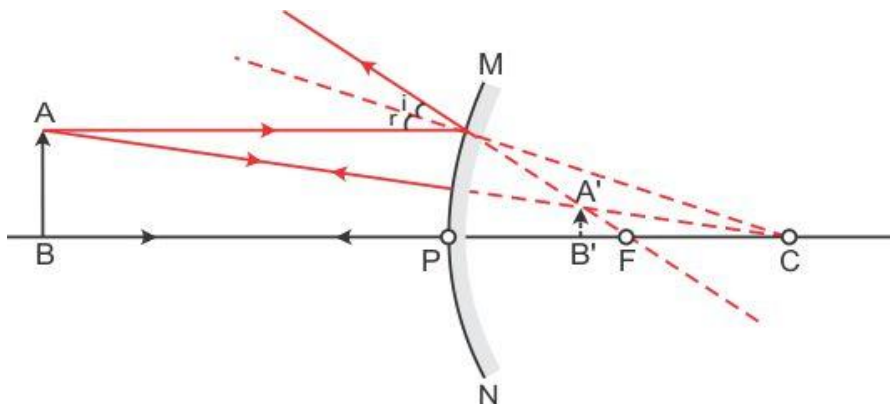
36. Mendel's experiment can be studied in the following ways:

- (i) Mendel first crossed pure-bred tall pea plants with pure-bred short pea plants and found that tall pea plants were produced in the F_1 generation.
- (ii) Mendel crossed the tall pea plants of the F_1 generation and found that tall plants and dwarf plants are in the ratio 3:1. Mendel observed that the dwarf trait of the pea plant which had disappeared in the F_1 generation progeny reappeared in the F_2 generation. He concluded by saying that traits are inherited independently.

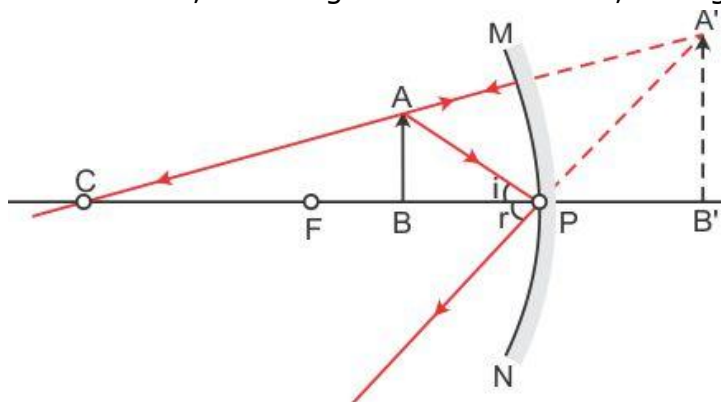
- 37.** The mirror used in a solar furnace is a concave mirror. Image formed by the concave mirror when placed inside a solar furnace:



The mirror used as a rear-view mirror is a convex mirror. Image formed by the convex mirror:



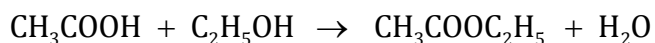
A concave mirror can form a magnified and virtual image. A convex mirror cannot form an enlarged image. When the object is placed between the pole and the focus of the mirror, the image formed is virtual, enlarged and erect.



38.

(a) Compound A with molecular formula $C_2H_4O_2$ is ethanoic acid, also called acetic acid. Its structural formula is CH_3COOH . A dilute solution of acetic acid called vinegar is used as a preservative of pickles.

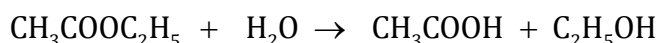
(b) Compound A reacts with ethanol to form compound B which is an ester and has a pleasant smell. The reaction is called esterification reaction.



Ethanoic acid

Ethyl ethanoate

(c) Compound A can be obtained from ethyl ethanoate by reacting with water in the presence of dilute hydrochloric acid acting as a catalyst.



Ethyl ethanoate

Ethanoic acid

(d) Process is ester hydrolysis.

(e) Carbon dioxide is evolved with effervescence when compound A reacts with washing soda.

39.

(a) Separation of oxygenated and deoxygenated blood allows a highly efficient supply of oxygen to the body. This is especially important in birds and mammals which have high energy needs and constantly use energy to maintain their body.

(b) The lungs contain millions of alveoli which provide a surface for the exchange of gases. An extensive network of blood vessels is present in the wall of the alveoli. By lifting our ribs and flattening the diaphragm, the chest cavity becomes spacious. Air is sucked into the lungs and alveoli. The oxygen from the breath diffuses into the blood and carbon dioxide from the blood (brought from all over the body) diffuses out to the air.

Trachea has rings of cartilage around it. These rings of cartilage prevent the trachea from collapsing when we breathe out.