

Self Assessment Paper

SECTION A

1. The two elements X and Y will show same chemical properties because they have same number of valence electrons in group. They form positively charged ions by losing one electron. $\frac{1}{2} + \frac{1}{2}$

2. Because producers (plants) have the ability to trap solar energy to make their own food with the help of chlorophyll.

[CBSE Marking Scheme, 2016] 1

3. The colour of litmus in a solution of sodium carbonate is blue. 1

4. Baking soda. 1

5. Pollination allows pollen grains that produce male germ cell to reach the carpel which contain the female germ cell, egg. Thus, fertilization which involves fusion of male and female germ cells can only occur only after pollination.

[CBSE Marking Scheme, 2016] 1

6. (d) Decomposition of calcium carbonate to form quick lime and carbon dioxide. The reactions which require energy in the form of heat, light or electricity to break reactants are called endothermic reactions. 1

OR

(b) All metal oxides react with water to give salt and acid.

Metal oxides are basic in nature. They form salts and water when react with acids except some amphoteric oxides like zinc oxide and aluminium oxide, thus, metal oxides are not salts. Therefore, all metal oxides react with water to give salt and acid is not correct. 1

7. (a) Here, angle of incidence $i = 60^\circ$
Angle of refraction $= r = 45^\circ$

Refractive index of the medium B relative to medium A

$$\begin{aligned} &= n_{BA} \frac{\sin i}{\sin r} = \frac{\sin 60^\circ}{\sin 45^\circ} \\ &= \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{\sqrt{2}} \end{aligned}$$

1

OR

(a) Greater than unity

Since, light rays in medium B go towards normal, so it has greater refractive index and lesser velocity of light with respect to medium A. So refractive index of medium B with respect to medium A is greater than unity. 1

8. (d) The image is erect in a plane mirror and also in a convex mirror, for all positions of the object. 1

9. (a) When a light ray passing through focus will fall on convex lens then, the emergent ray of light will become parallel to the principal axis. So, Figure A is correct. 1

OR

(b) The distance of the sun is infinite as compared to the radius of curvature of concave mirror, so, light rays from sun incident parallel all the rays converge at the principal focus. So, the focal length is 15 cm. In case of a concave mirror, the size of image and object will be same if the object is placed at $2f$. Hence, in this case object must be placed at $2f$ or $2 \times 15 = 30$ cm. 1

10. (c) Let the original value of current is I ampere. The new value of current

$$I' = I + 100\%I = 2I.$$

Now, the new power

$$P' = I'^2R = 4I \cdot R = 4P.$$

So, the change in power

$$= P' - P = 3P$$

Therefore, the change in power in terms of percentage is 300%.

Hence, the increase in power dissipated will be 300% 1

11. (d) The power dissipated by an electric bulb is given as $P = VI$.

In this case,

$$\text{Power } P = 100 \text{ W}$$

and Voltage $V = 220 \text{ V}$.

$$R = \frac{V^2}{P} = \frac{220 \times 220}{100}$$

$$= 484 \Omega$$

When the supplied voltage is 110 V, the power

consumed will be $P = \frac{V^2}{R} = \frac{110 \times 110}{484}$.

Hence, the power consumed when operated at 110 V is 25 W. 1

OR

- (a) Unit of electric power is volt-ampere. 1

12. (c) producing induced current in a coil due to relative motion between a magnet and the coil 1

13. (d) All of the above. 1

The eco-friendly habits that we should adopt in our day-to-day life.

- (i) Switch off the light when not in use.
 (ii) Walk to school or use bicycle.
 (iii) Always carry cotton bags instead of using plastic bags

OR

- (d) Disposable plastic plates should not be used because they are made of non-biodegradable materials. Under certain conditions, the non-biodegradable substances can persist for longer time and can also harm the various components of ecosystem. 1

14. (a) Isomers are defined as those compounds that possess same molecular formula but different structural arrangement. Butane has the molecular formulae C_4H_{10} . Therefore, the structural isomers of butane will be n-butane and iso-butane 1

15. (c) There is no atmosphere in outer space for scattering, so sky appears dark. 1

16. (c) **Explanation** : Puberty in boys is regulated by male sex hormone called testosterone, which are secreted by testes. In puberty, secondary sexual characters like growth of hair on face, chest, broadening of shoulders and deepening of voice occurs.

17. (a) (i) Bulb A and B do not glow but bulb C glows.

- (b) Glucose and alcohol solutions do not conduct electricity as they do not have ions. Dil. HCl contains ions so the flow of ions is responsible for the flow of current.

- (c) (i) In a dilute aqueous solution of hydrochloric acid, $H_3O^+ + Cl^-$ ions are present.

- (d) (i) After replacement, bulb glows in B as NaOH solution contains ions (Na^+ and OH^- ions).

- (e) Glucose and alcohol do not produce H^+ ions, when dissolved in water, even though they contain hydrogen. When acid is dissolved in water, produce H^+ ion. 1+1+1+1+1

18. (a) (ii) Alveoli

- (b) (iii) R (Trachea)

- (c) (i) It is not the secondary organ for respiration.

- (d) (i) Trachea is divided into two smaller tubes called bronchi.

- (e) (i) Alveoli contain an extensive network of blood vessels which exchange gases. They increase surface area of absorption of gases. 1+1+1+1

19. (a) (i) A-Seminal vesicle, B-Prostate gland

- (b) (iii) Testosterone

- (c) (iv) Controls gamete formation and develops sexual characteristics in human males.

- (d) (i) C-Sperms, D- semen and urine.

- (e) (iv) Sperms contain one of the two types of sex chromosomes *i.e.*, X chromosomes and Y chromosomes while egg contains one type of sex chromosomes *i.e.*, X chromosome. 1+1+1+1

20. (a) (i) When key is closed, a momentary deflection is shown by the galvanometer and when the key is opened, a momentary deflection is shown by the galvanometer but in the opposite direction.

- (b) When key is closed or opened, the current in the coil I changes, therefore the magnetic field linked with coil II changes and hence a current is induced in it.

- (c) (i) Electromagnetic induction. It is the process by which a changing magnetic field in a conductor induces current in another conductor.

- (d) Primary coil — coil I

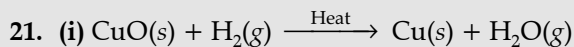
Secondary coil — coil II 1

- (e) (i) **Fleming's Right Hand Rule** : Stretch the first three fingers of the right hand mutually perpendicular to each other such that the forefinger gives the direction

of magnetic field and the thumb points in the direction of the motion of a conductor then, the middle finger will give the direction of the induced current.

1+1+1+1

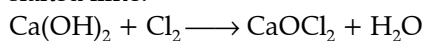
SECTION B



(ii) Redox reaction.

[CBSE Marking Scheme, 2015] 1+1

22. Bleaching powder is calcium oxychloride. It is prepared by the action of chlorine on dry slaked lime. $\frac{1}{2} + \frac{1}{2}$



Bleaching
power

Uses :

- (i) Used for bleaching cotton and linen in the textile industry and wood pulp in paper industry etc.
- (iii) It is used for disinfecting the drinking water. $\frac{1}{2} + \frac{1}{2}$

23. (i) Sodium $\frac{1}{2}$

(ii) Iodine $\frac{1}{2}$

(iii) Gallium or cesium $\frac{1}{2}$

(iv) Lead or mercury. $\frac{1}{2}$

OR

Metals in increasing order of reactivity - Copper, iron, zinc and magnesium

- (i) Colour of the solution changes from blue to green
- (ii) Reddish brown deposits on iron filings. 2

[CBSE Marking scheme, 2018]

Commonly Made Error

- Usually students get confused with the order of reactivity of metals.

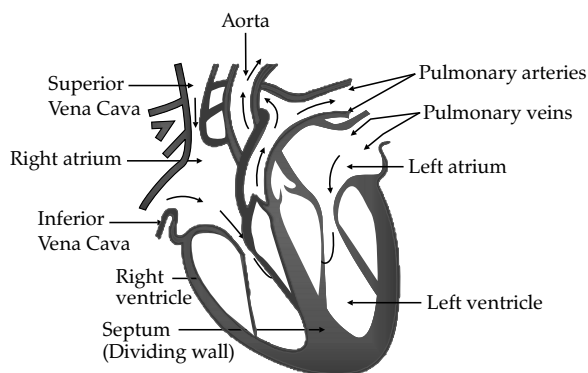
Answering Tip

- Learn and practice the reactivity series of metals. Keenly observe the practicals done. Learn the concept on how the more reactive metals replace the less reactive metals.

24. (i) As ventricle has to pump blood into various organs. Therefore it has wall thicker than that of atria.

(ii) Since the blood emerges from the heart under high pressure. 2

OR



2

25. By suspending magnetised bar and identifying its north and south poles.

By finding the polarity of electromagnet using the property-like poles repel each other. 2

26. Electrical Resistance, $R = \frac{V}{I}$ $\frac{1}{2}$

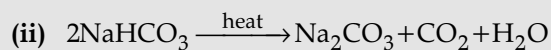
The resistance of a conductor is said to be one ohm if the potential difference applied across its ends is 1 volt and a current of 1 A flows through it. Its SI unit is ohm (Ω) 1

$$1 \text{ ohm} = \frac{1 \text{ volt}}{1 \text{ ampere}} \quad \frac{1}{2}$$

[CBSE Marking Scheme, 2014]

SECTION C

27. (i) Sodium bicarbonate / Sodium hydrogen carbonate / baking soda and its formula is NaHCO_3



(iii) It is used in fire extinguisher and for baking.

(Any one) 1 + 1 + 1

[CBSE Marking Scheme, 2020]

Commonly Made Error

- Students often write incorrect chemical formula. Many of them forget to write the balanced chemical equation as asked in question.

Answering Tip

- Learn the concept of salts with examples and use. Practice writing the balanced chemical equation.

OR

- (a) The cake will have a bitter taste because of the formation of Na_2CO_3 /sodium carbonate while baking/heating.
 (b) By adding tartaric acid
 (c) The liberated CO_2 gas.

[CBSE Marking Scheme, 2018] 1 + 1 + 1

Commonly Made Error

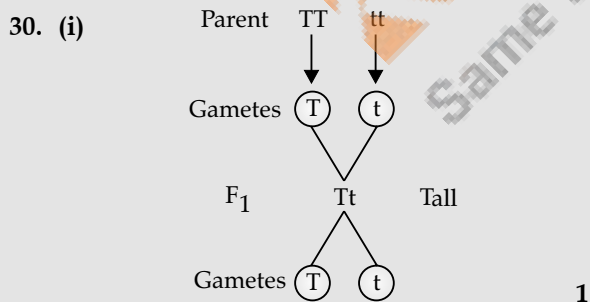
- Usually students get confused with baking powder and baking soda.

Answering Tip

- Baking soda is sodium hydrogen carbonate from which baking powder is prepared.

28. (i) Non-metals are electron acceptors, they cannot supply electrons so as to convert H^+ ion to $\text{H}_2(\text{g})$.
 (ii) Like metals, hydrogen can lose an electron to form positive H^+ ion.
 (iii) Aluminium is covered with a strong protective layer of oxide which protects the metal from further corrosion. **1+1+1**

29. (i) **Arteries** : No valves / thick walled / carry oxygenated blood / carry blood away from heart.
 (ii) **Veins** : Presence of valves / thin walled / carry deoxygenated blood / carry blood towards heart.
 (iii) **Capillaries** : Very fine / mixed blood / found in tissues / sites for material exchange. **1+1+1**
 [CBSE Marking Scheme, 2019]



The dwarf traits of the plants are not expressed due to the presence of the dominant tall trait.

Tall : Dwarf = 3 : 1 ratio **1**

- (ii) In the F_2 generation, both the tall and dwarf traits are present in the ratio of 3 : 1. This showed that the traits for tallness and

dwarfness are present in the F_1 generation, but the dwarfness, being the recessive trait, does not express itself in the presence of tallness, the dominant trait. **1**

[CBSE Marking Scheme, 2016]

Commonly Made Error

- Most students make error in explaining this concept.

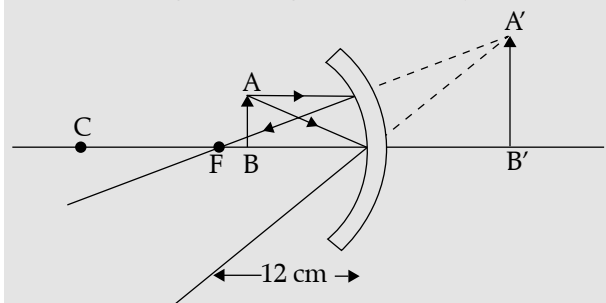
Answering Tip

- Practice cross with the help of different characteristic features in three stages:
 (a) Parents
 (b) F_1 generation
 (c) F_2 generation

31. (a) Large jar filled with water, oxygen, food and aquatic plants and animals.
 (b) Oxygen/oxygen pump.
 (c) Fish food.
 (d) Aquatic plants/Producers provide O_2 during photosynthesis.
 (e) Aquatic animals/Consumers release CO_2 for the process of photosynthesis.
 (f) Decomposers are also important for natural cleaning of the aquarium.

[CBSE Marking Scheme, 2020] $\frac{1}{2} \times 6$

32. (i) Range of distance should be 0 cm to < 12 cm. $\frac{1}{2}$
 (ii) The image will larger than the object. $\frac{1}{2}$

**1**

(0.5 mark to be deducted if no arrows marked or wrongly marked arrows)

- (iii) Image will be at 24 cm in front of the mirror or the image is formed at C

[CBSE Marking Scheme, 2020] 1+1+1

OR

$$R_a = \frac{L}{A} \quad \frac{1}{2}$$

$$R_b = \rho \left(\frac{3L}{A/3} \right) = 9 \frac{\rho L}{A} = 9 R_a \quad \frac{1}{2}$$

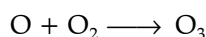
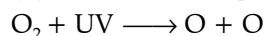
$$R_c = \rho \frac{L/3}{3A} = \frac{1}{9} \frac{\rho L}{A} = \frac{1}{9} R_a \quad \frac{1}{2}$$

$$\text{Hence } R_b > R_a > R_c \quad \frac{1}{2}$$

$\rho_a = \rho_b = \rho_c$ because all the three conductors are of same material.

[CBSE Marking Scheme, 2018] 1

33. In Stratosphere, O_2 gas molecules absorbed UV-C light emitted by sun and splitted into oxygen atoms. These oxygen atoms react with other oxygen molecules to produce ozone.



Chlorofluorocarbons (CFCs) cause depletion of ozone. CFCs are broken up by UV radiations and release chlorine atoms, which destroy the ozone. 1

SECTION D

34. (i) **Valency** : The combining power or the combining capacity of an atom is called its valency.
- (ii) **Atomic size** : Atomic size or atomic radius is the distance between the centre of the nucleus and the outermost shell of an isolated atom.
- (b) On moving from left to right in the periodic table, valency increases up to 4 and then decreases.

The electrons present in the last shell determine the valency of a particular element.

If the number of valence electrons is less than or equal to 4, valency = number of valence electrons

If the number of valence electrons is more than 4, valency = 8 – number of valence electrons

Atomic size decreases along a period. This is because on moving across a period, the number of valence shells remains the same and the electrons increase by one unit. As a result, the nuclear charge increases and thus, the atomic radius decreases. 1 + 1 + $\frac{1}{2}$ + $\frac{1}{2}$

OR

| Sr. No. | Characteristics | A | B |
|---------|------------------------------------|---------------|---------------|
| (i) | Number of electrons in their atoms | 12 | 13 |
| (ii) | Size of their atoms | Bigger | Smaller |
| (iii) | Their tendencies to lose electrons | More | Less |
| (iv) | The formula of their oxides | AO | B_2O_3 |
| (v) | Their metallic character | More metallic | Less metallic |
| (vi) | The formula of their chlorides | ACl_2 | BCl_3 |

[CBSE Marking Scheme, 2016] $6 \times \frac{1}{2} = 3$

35. (a) **Pollination** : Process of transfer of pollen grains from the anther to the stigma of the flower. 1

Two types : Self-pollination and Cross pollination $\frac{1}{2} + \frac{1}{2}$

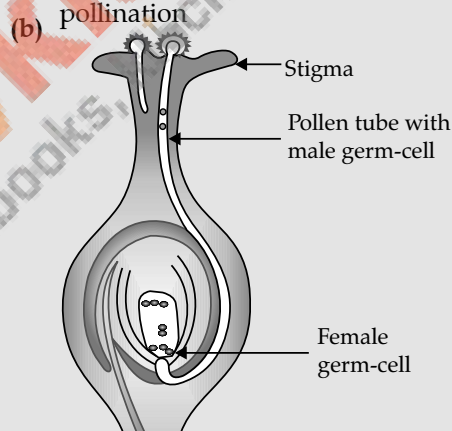


Diagram 1 $\frac{1}{2}$
Three labellings $\frac{1}{2} \times 3$

[CBSE Marking Scheme, 2017]

36. (a) (i) Place a strong source of white light at the focus of converging lens.
- (ii) Allow the light beam to pass through a transparent glass tank containing clear water. In that clear water dissolve 200g of sodium thiosulphate in about 2 L of clean water in the tank and add 1 to 2 mL of conc. H_2SO_4 acid.
- (iii) Allow the beam of light to pass through a circular hole made in a cardboard. Obtain a sharp image of circular hole on screen by using converging lens. 3

- (b) At sunrise or sunset light travels long distance through thick layers of atmosphere. Blue and other lower wavelength get scattered and only red light reaches earth. 2

[CBSE Marking Scheme, 2015]

OR

Tyndall effect : When a beam of light is passed through a colloidal solution, placed in a dark room, the path of beam becomes illuminated when observed through a microscope placed perpendicular to the path of light. This effect is called Tyndall effect. 1 + 1 + ½ + ½

OR

Cause of Tyndall effect : The size of the colloidal particle is relatively larger than the

solute particle of a true solution. The colloidal particles first absorb energy from the incident light and then scatter a part of this energy from their surfaces. Thus, Tyndall effect is due to scattering of light by the colloidal particles and the colloidal particles are seen to be moving as points of light moving against a dark background.

Some daily phenomena based on Tyndall effect are as follows :

- (i) When a fine beam of sunlight enters a smoke filled room through a small hole, the smoke particles become visible due to the scattering of light.
- (ii) When sunlight passes through a canopy of a dense forest, the tiny water droplets in the mist scatter light and become visible. 5

□□□

Kopykitab
Same textbooks, klack away