

Self Assessment Paper

SECTION A

1. Cord is made up of copper wire whereas heating element is made up of alloy.

[CBSE Marking Scheme, 2019] 1

2. It burns completely / burns without smoke / high calorific value.

[CBSE Marking Scheme, 2019] 1

OR

Hot spots are place within the mantle where rocks melt to generate magma. 1

3. (a) Refining of metal is the process of purification of the metal obtained after reduction.

(b) Correct option : (i)

Explanation : Metals like Cu, Zn, Ag and Au are refined by electrolytic refining.

(c) Correct option : (a)

Explanation : Ions of zinc are positively charged, thus while electrolytic refining of zinc, zinc is deposited at cathode (negatively charged pole).

(d) In electrolytic refining of copper, **anode** is impure copper while **cathode** is a strip of pure copper. 1+1+1+1

4. (a) It is the male reproductive system of humans.

(b) The part label as 8 is urethra. It is a common passage for both sperms and urine.

(c) The part label as 7 is vas deferens. Blocking of vas deferens prevents passage of sperms. Hence, there is no fertilization thus it prevents pregnancy.

(d) Puberty 1+1+1+1

5. Correct option : (a)

Explanation : In the presence of sunlight, the heavy amount of energy of light decomposes AgCl to silver (Ag^+) and chloride (Cl^-) ions. The silver flakes are truly black which when fully spread over white silver chloride looks grey. 1

6. Correct option : (a)

Explanation : Gastric juice is acidic. Thus, pH value of gastric juice is less than 7. 1

OR

Correct option : (a)

Explanation : Many gaps for the undiscovered elements were left in the periodic table by Mendeleev. For instance, the elements scandium (Sc), gallium (Ga), and germanium (Ge) were not known at Mendeleev's time, but he had predicted their existence in advance of their discovery. 1

7. Correct option : (d)

Explanation : Nephrons are the structural and functional filtration unit of kidney that serve in filtration, reabsorption and secretion. Ureters are small muscular tubes that extend from the kidney and carry urine into the urinary bladder. The urethra is a canal that carries urine from bladder and expels it out of body. 1

8. Correct option : (b)

Explanation : In a neuron, conversion of electrical signal to a chemical signal occurs at axonal end. When an electrical signal reaches the axonal end of a neuron, it releases a chemical substance. This chemical diffuses towards the dendritic end of next neuron where it generates an electrical impulse or signal. Hence, the electrical signal is converted

into a chemical signal at the axonal end. Since these chemicals are absent at the dendrite end of the neuron, the electrical signal, cannot be converted into chemical signal. 1

9. **Correct option :** (a)

Explanation : Convex mirror is used as rear-view mirror in vehicles. It forms virtual, erect, and diminished images of the objects.

Magnification produced by a rear-view mirror fitted in vehicles is less than one. 1

10. **Correct option :** (c)

Explanation : The relaxation or contraction of ciliary muscles changes the curvature of the eye lens. The change in curvature of the eye lens changes the focal length of the eyes. Hence, the change in focal length of an eye lens is caused by the action of ciliary muscles. 1

11. **Correct option :** (b)

Explanation : Red colour scatters the least so that it travels the farthest. During sunset or sunrise, light has to travel a longer distance to reach us. Hence, only red light reaches to us and the sky appears reddish. 1

12. **Correct option :** (c)

Explanation : We know that power is defined as rate of doing work. A bulb consumes electric energy and produces heat and light. Now, bulb with more power rating will produce more heat and light or we can say that power rating of bulb is directly proportional to the brightness produced by bulb. Therefore, brightness of bulb B with power rating 100W will be more than the brightness of bulb A having power rating as 40 W and C of 60 W. 1

13. **Correct option :** (a)

Explanation : Pancreas secretes insulin which helps to regulate blood sugar levels in the body.

Insulin helps the cells absorb glucose, reducing blood sugar and providing the cells with glucose for energy. When blood sugar levels are too low, the pancreas releases glucagon. Glucagon instructs the liver to release stored glucose, which causes blood sugar to rise 1

OR

Correct option : (c)

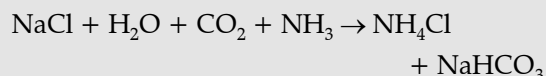
Explanation : Puberty in boys is regulated by male sex hormone called testosterone, which are secreted by testes. In puberty, secondary sexual characters like growth of hair on face, chest, broadening of shoulders and deepening of voice occurs. 1

14. **Correct option :** (a)

Explanation : In vacuum, speed of light is independent of wavelength. Hence, no dispersion takes place in vacuum. Thus, vacuum is a non-dispersive medium in which all colours travel with the same speed.

SECTION B

15. NaHCO_3 (Sodium Hydrogen Carbonate/
Sodium bicarbonate)



Uses :

(i) For making baking powder

(ii) As ingredient of antacid.

(iii) Soda-acid fire extinguishers (Any two)

Note : As no salt can have $\text{pH} = 14$, give full credit for any attempt of the candidates.

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

Commonly Made Error

- Students usually get confused with the formula and preparation of sodium bicarbonate.

Answering Tip

- Learn the chemical formulae and practice all the preparation reactions.

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. 1 + 1 + 1

[CBSE Marking Scheme, 2018]

Commonly Made Error

- Students usually get confused with baking powder and baking soda.

Answering Tip

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

16. The compounds that are formed due to sharing of electrons between two atoms / compounds having covalent bonds. 1

Ionic compounds are formed due to transfer of electrons from one atom to another / compounds having ionic bonds/compounds having attraction between oppositely charged ions. 1

Properties of covalent compounds :

- (i) They are poor conductors of electricity. $\frac{1}{2}$
 (ii) They have low melting and boiling point. $\frac{1}{2}$

(or any other)

[CBSE Marking Scheme, 2017]

17. Electronic Configuration of 'P' : 2, 8, 7
 Group number : 17
 Period number : 3rd Period
 Electronic Configuration of 'Q' : 2, 8, 8, 1
 Group number : 1
 Period number : 4th Period **1 + 1 + 1**
 [CBSE Marking Scheme, 2017]

18. (a) The hormone which regulates carbohydrates, protein and fat metabolism in our body is thyroxine. **1**
 (b) Thyroxine hormone is secreted by thyroid gland. **1**
 (c) Iodised salt in diet is important because it contains iodine, which is essential for the synthesis of thyroxine hormone by the thyroid gland. In case of iodine deficiency in our diet, there would be less production of thyroxine hormone, which may result into a disease called goitre. **1**

19.

→ Vegetative propagation is propagating (or growing) plants from their vegetative parts like stem, leaves, roots etc. is known as vegetative propagation.

Advantages :-

- 1) Plants produced by vegetative propagation flower & have fruits much earlier than plants produced by seeds.
- 2) It is easy, fast method and can be used for propagation of plants which don't produce seeds.

Disadvantages :-

- 1) Since plants are genetically very similar & almost identical, no new variations can be generated.
- 2) Plants can still suffer from various plant diseases.

[Topper's Answer, 2017]

Detailed Answer :

Vegetative propagation is a mode of asexual reproduction in which new plants are formed from vegetative parts of the plants like root, stem, leaf and buds. e.g. eyes of potato. **1**

Advantages :

- (i) Offsprings are genetically identical and therefore useful traits can be preserved. **1**
 (ii) It is a rapid and economical method. $\frac{1}{2}$

Disadvantages :

- (i) New characters cannot be introduced. $\frac{1}{2}$
 (ii) The disease of the parent plant gets transferred to the offsprings.

OR

Ans 11 :- → Reproduction is an important characteristic of living beings because :-

- 1) It promotes continuity of life.
- 2) It promotes stability of species.
- 3) It includes creation of variations that are the basis of evolution.
- 4) It regulates population.

[Topper's Answer, 2017]

Detailed Answer :

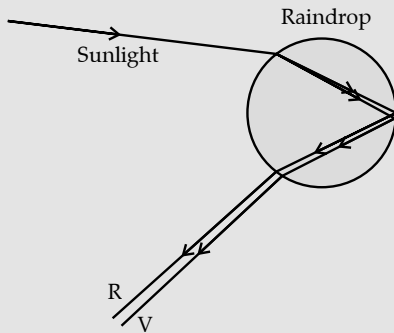
Reproduction is an important characteristic of living beings because :

- (i) It promotes continuity of life.
- (ii) It promotes stability of species.
- (iii) It includes creation of variations that are the basis of evolution.

1 + 1 + 1

20. Rainbow is a natural spectrum appearing in the sky after a rain shower, caused by dispersion of sunlight by tiny water droplets present in the atmosphere.

Formation of rainbow :



[CBSE Marking Scheme, 2019] 1 + 2

21. $R_a = \frac{\rho L}{A}$ $\frac{1}{2}$

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

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

Hence $R_b > R_a > R_c$ $\frac{1}{2}$
 $\rho_a = \rho_b = \rho_c$ because all the three conductors are of same material. 1

[CBSE Marking Scheme, 2019]

22. (i) No, because a charged particle at rest does not interact with magnetic field. 1
 (ii) No, because the force is zero if current and field are in the same direction. 1
 (iii) Yes, because the force is maximum when current and magnetic field are perpendicular. 1

[CBSE Marking Scheme, 2018]

23. (a) Because they are non - biodegradable. 1
 (b) (i) Carrying tiffin and water in steel containers.
 (ii) Encourage the use of ink pens (ball pens are made up plastic) / or any other. (Any two) $\frac{1}{2} + \frac{1}{2}$
 (c) By spreading awareness in the form of Nukkad Natak, Speeches in Morning Assembly, Class discussion, Display Boards etc. (Any two) $\frac{1}{2} + \frac{1}{2}$

[CBSE Marking Scheme, 2018]

OR

Managing resources to meet current basic human needs, while preserving the resources for the needs of future generations and maintaining the quality of the environment. 1

Importance :

- (a) To maintain the quality of the environment. 1
- (b) To ensure the continuity of the resources 1

Reuse : Because process of recycling uses some energy and takes some time. 1

[CBSE Marking Scheme, 2018]

24. → (a) 1) By making them understand the need and important of water.
 2) By awaring them about water saving methods like - watering plants in evening or roof top rainwater harvesting.
 3) By making them aware of less water using habits.
) 1) Increasing vegetation → Increased vegetation allows percolation of water from the rain into the ground to increase water table level. We should use handpumps & wells judiciously.

[Topper's Answer, 2017] 3

Section 'C'

25. (i) Correct definition.
 (ii) Rusting.
 (iii) Silver - black, copper - green.
 (iv) Destruction of car bodies, bridges, railing, etc
 (Any two)
 (v) Painting, alloying, greasing etc. (Any two)
 [CBSE Marking Scheme, 2016] 5

Detailed Answer :

- (i) Corrosion is a process in which metals are deteriorated by action of air, moisture, chemicals etc. 1
 (ii) Corrosion of iron is called rusting. 1
 (iii) Silver turns black as it reacts with H_2S present in air and form a layer of Ag_2S . 1
 (iv) Corrosion of iron is a serious problem because it leads to wastage of tonnes of iron every year and lot of money is spent to repair or replace it. 1
 (v) The iron articles should be painted to prevent it from corrosion. 1

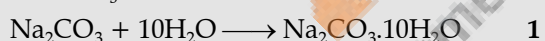
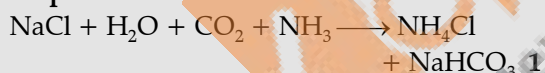
OR

$Na_2CO_3 \cdot 10H_2O$: Sodium carbonate decahydrate.

Na_2CO_3 : Anhydrous sodium carbonate.

$10H_2O$: Water of crystallization which impacts shape and colour to the crystals. $\frac{1}{2} + \frac{1}{2}$ 1

Preparation :



Uses :

- (i) Used in glass, soap and paper industries.
 (ii) Used in the manufacture of borax.
 (iii) Used as a cleansing agent for domestic purpose. (Any two) 1
 [CBSE Marking Scheme, 2012]

26. (i) Soap molecules have two ends— one end is the hydrocarbon chain which is water repellent, whereas the other end is the ionic part which is water soluble end. When soap is dissolved in water it forms a group of many molecules, known as micelle. 1
 (ii) These micelles are formed because their hydrocarbon chains come together and the polar ends are projected outwards. 1
 (iii) Micelle formation in ethanol will not occur because the hydrocarbon chain end of the soap will dissolve in ethanol. 1

- (iv) Soaps in the form of micelle are able to clean dirty clothes having oily spots, as the oily dirt is collected in the centre of the micelle, which forms an emulsion in water and on rinsing, the water washes away the micelles with dirt attached to them. 2
 [CBSE Marking Scheme, 2012]

27. (i) **Receptor** : Specialised tips of some nerve cells, which receive information from the surroundings.

Location - Sense organs

Gustatory receptor - detect taste

Olfactory receptor - detect smell

- (ii) The information acquired at the end of the dendritic tip of a nerve cell, sets off a chemical reaction that creates an electrical impulse, which travels to the cell body, then along the axon to its end releases some chemicals, across the synapses. 1 + 1 + 1 + 2
 [CBSE Marking Scheme, 2012]

OR

Unisexual Flower : Papaya/Water-melon

(any one) $\frac{1}{2}$

Bisexual Flower : Hibiscus/Rose/ any other

(any one) $\frac{1}{2}$

Self pollination : The pollen grains are transferred from the anther to the stigma of the same flower or to the flower of the same plant. 1

Cross pollination : The pollen grains are transferred from the anther to the stigma of a flower of a different plant. 1

After pollen lands on a suitable stigma, a pollen tube grows out of pollen grain and travels through the style to reach the ovary. $\frac{1}{2}$
 The male germ cell fuses with the female germ cell to form a zygote. $\frac{1}{2}$

Zygote divides several times to form an embryo within the ovule. $\frac{1}{2}$

The ovule develops tough coat and gradually gets converted into a seed. $\frac{1}{2}$

[CBSE Marking Scheme, 2017]

28. (a) Mendel conducted a Monohybrid cross/ (crossed pure tall pea plants with pure dwarf pea plants). He observed only tall pea plants in the F_1 generation, but on self-crossing the F_1 progeny, both tall and dwarf pea plants were observed in F_2 generation in the ratio 3 : 1. Appearance of tall character in F_1 and F_2 generations shows tallness to be a dominant character. But absence of dwarf character in F_1 and its reappearance in F_2 confirms that dwarfness is recessive character. $2\frac{1}{2}$

- (b) Mendel conducted a dihybrid cross and observed that though he started with two types of parents, he obtained four types of individuals in F_2 . The appearance of new recombination in F_2 generations along with parental type characters showed that traits are inherited independently of each other.

[CBSE Marking Scheme, 2017] 2½

Detailed Answer :

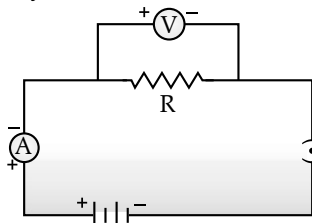
- (a) Mendel conducted experiment on garden pea plant, selecting seven visible contrasting characters. He selected and crossed homozygous tall pea plant having the genotype TT with a homozygous dwarf pea plant having the genotype tt . F_1 generation consisted only of tall plants having genotype Tt.

The expressed allele T for tallness is dominant over the unexpressed allele t for dwarfness. Hence, the trait of tallness is dominant while dwarfness or shortness is the recessive characteristics. Thus, Mendel's experiment showed that traits may be dominant or recessive.

- (b) Mendel carried out dihybrid crosses by crossing two pea plants differing in contrasting traits of two characters.

For example he crossed a pea plant having yellow coloured and round seed with another pea plant bearing green coloured and wrinkled seed. In the F_2 generation, he got the pea plants with two parental and two recombinant phenotypes as yellow round and green wrinkled (parental) and yellow wrinkled and green round (recombinant). This indicated that traits separated from their original parental combinations and got inherited independently. 5

29. (a)



The formula states that the current passing through a conductor is directly proportional to the potential difference across its ends, provided the physical conditions like temperature, density, etc. remain unchanged. This is Ohm's law.

$$I \propto V \text{ or } I = \frac{V}{R}$$

$$V = IR.$$

R is called resistance of the conductor.

- (b) As $V = 1.05 \text{ V}$
 $I = 0.15 \text{ A}$
 $V = IR$
 $1.05 = 0.15 \times R$
 $R = \frac{1.05}{0.15} = 7 \Omega$ 3 + 2

OR

- (i) (a) In (I) current is constant while in (II) current is variable.
 (b) In (I) current is in positive state while in (II) current is in both states.
 (ii) I — Direct current
 II — Alternating current
 (iii) I — From battery
 II — From power supply in our houses
 (iv) Because current type is alternating current wherein it shows 50 times in positive and 50 times in negative direction alternatively in one second that's why frequency is 50 Hz.

2 + 1 + 1 + 1

30. (a) (i) Listing of any two (out of four) rays and stating their path after reflection from a concave mirror. 1 + 1

- (ii) Ray diagram :

Using these two rays for the ray diagram when the object is in between the pole and the focus of the mirror. 1

- (b) Given, $u = -20 \text{ cm}$, $m = -3$

$$m = \frac{-v}{u} \quad \frac{1}{2}$$

$$\therefore -3 = -\left(\frac{v}{-20}\right) \quad \frac{1}{2}$$

$$v = -3 \times 20 = -60 \text{ cm} \quad \frac{1}{2}$$

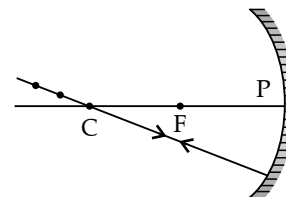
Distance between the object and the screen is $40 \text{ cm} = -60 \text{ cm} - (-20 \text{ cm}) = -40 \text{ cm}$ ½

[CBSE Marking Scheme, 2017]

Detailed Answer :

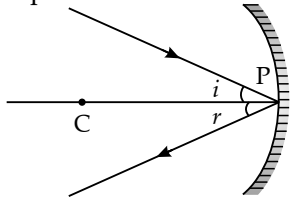
- (a) Two light rays whose paths of reflection are known :

- (i) The incident ray passes through the centre of curvature : In this case, light after reflecting from the concave mirror moves back in the same path. This happens because light is incident perpendicular on the mirror surface.

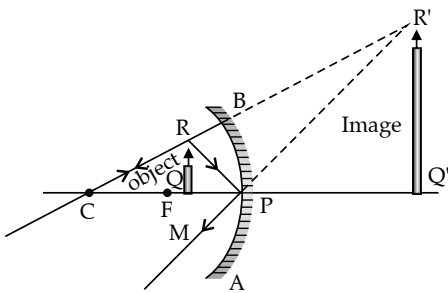


Solutions

- (ii) **The ray incident obliquely to the principal axis :** In this case, the incident ray will be reflected back by the reflecting surface of the concave mirror obliquely and making equal angles with the principal axis.



Let an object is placed between the focus and pole of the concave mirror. Then using above two rays, image of the candle can be located as shown below :



The image is formed behind the mirror. The image is virtual, erect and magnified. 1 + 1 + 1

- (b) Given, $m = -3$, $u = -20$ cm, $v = ?$

As we know,

$$m = -\frac{v}{u}$$

$$-3 = -\left(\frac{v}{-20}\right)$$

$$v = -60 \text{ cm}$$

The screen is placed in front of the mirror at a distance of 60 cm from the pole of the mirror. Thus, the screen is placed 40 cm away from the object. 2

Commonly Made Error

- Students often fail to draw a well-labelled ray diagram.

Answering Tip

- Practice drawing the ray diagram carefully.

□□□