

Goa Board
Class X Science
Term 1
Sample Paper – 1 Solution

Time: 3 hrs**Total Marks: 90**

SECTION A

1. **Ans.** The condition produced due to oxidation of fats and oils present in foods by virtue of which foods develop unpleasant smell and taste is called rancidity.
2. **Ans.** Potential difference of 1 volt means that one joule of work is done to move a charge of one coulomb from one point to another.
3. **Ans.** When we keep plant cells in a hypotonic solution, they absorb water from the surroundings and become more turgid.
4. **Ans.** In a physical change, there is only change of state of substance and no new substance is formed. Thus, melting of wax is a physical change because solid wax changes to liquid wax and no new substance is formed.
In a chemical change, a new substance is formed. Thus, the burning of wax is a chemical change because wax (made of hydrocarbons) burns to produce carbon dioxide and water vapour, i.e. new products are formed.

5. **Ans.** Let the resistance of the combination of R_2 , R_3 and R_4 be x , then

$$\frac{1}{x} = \frac{1}{R_2 + R_3} + \frac{1}{R_4} = \frac{1}{6} + \frac{1}{3} = \frac{1}{2}$$

$$\therefore x = 2 \Omega$$

Hence, the equivalent resistance of the circuit =

$$R = R_1 + x + R_5$$

$$R = 3 + 2 + 3$$

$$\therefore R = 8 \Omega$$

6. Ans.

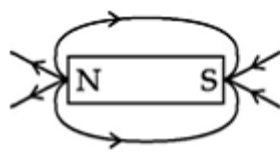


Fig. (1)

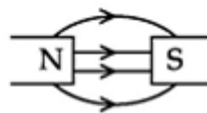


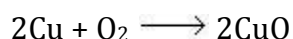
Fig. (2)

7. Ans.

Xylem	Phloem
(i) It helps in the transportation of food.	(i) It helps in the transportation of water and minerals.
(ii) It shows bidirectional movement.	(ii) It shows unidirectional movement.
(iii) It requires energy in the form of ATP for movement of substances.	(iii) It uses diffusion for movement of substances.

8. Ans.

(a) When copper metal is heated in air, it gets oxidised to form copper oxide.

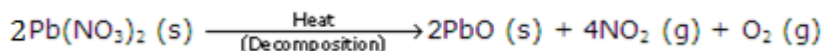
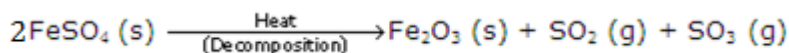


It is an oxidation reaction because copper is oxidised to copper oxide.

(b) When hydrogen gas is passed over heated copper oxide, black copper oxide is reduced and brown copper metal is obtained.

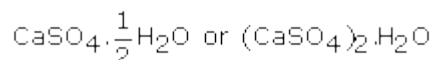


9. Ans.



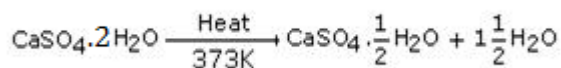
10. Ans.

(i) The chemical name of 'Plaster of Paris' is calcium sulphate hemihydrate.



(ii) It is prepared by heating gypsum to a temperature of 100°C (373 K) in a kiln.

(iii) Chemical equation:



11.Ans.

- (i) Solution A: Test the solution with blue litmus paper. There will be no change in the colour of blue litmus paper.
- (ii) Solution B: Test the solution with blue litmus paper. The colour of blue litmus paper will change to red.
- (iii) Solution C: Test the solution with a piece of red litmus paper (formed in step ii). The colour of red litmus paper will change back to blue.
Again test solution A with a piece of red litmus paper, there will be no change in colour.
Hence, solution A (distilled water) is neutral because it does not bring out any change in the colour of litmus paper. Solution B is acidic because it turns blue litmus paper red. Solution C is basic because it turns red litmus paper blue.

12.Ans.

- (i) Ionic compounds have high melting points because there is a strong electrostatic force of attraction between the oppositely charged ions of ionic compounds. Hence, a large amount of energy is required to break this strong bonding force between ions.
- (ii) Ionic compounds are very hard solids due to the strong force of attraction between the oppositely charged +ve and -ve ions.
- (iii) Ionic compounds dissolve in water because water has a high dielectric constant due to which it weakens the attraction between the ions.

13.Ans.

- (i) If the bulb B_3 gets fused, then the other two bulbs will continue glowing with the same brightness.
- (ii) When the bulbs are in parallel, wattage will be added (4.5 W) and the ammeter reading would be $45/45 = 1.0$ ampere.
- (iii) Because the ammeter reading is 1.0 ampere, the resistance of the combination is

$$\frac{4.5 \text{ V}}{1.0 \text{ A}} = 4.5 \Omega$$

14.Ans.

- (i) Potential energy
- (ii) Potential energy (of stored water) into electrical energy
- (iii) (a) People are sensitive to the environment.
(b) They have compassion for animals and are proactive and responsible.

15.Ans.

- (a) Same wattage is connected in series:
 - 1. Current and voltage are same.
 - 2. Nothing is different.
- (b) Same wattage is connected in parallel:
 - 1. Current and voltage are same.
 - 2. Nothing is different.
- (c) Different wattage is connected in series:
 - 1. Current is same.
 - 2. Voltage is different.
- (d) Different wattage is connected in parallel:
 - 1. Voltage is same.
 - 2. Current is different.

16.Ans.

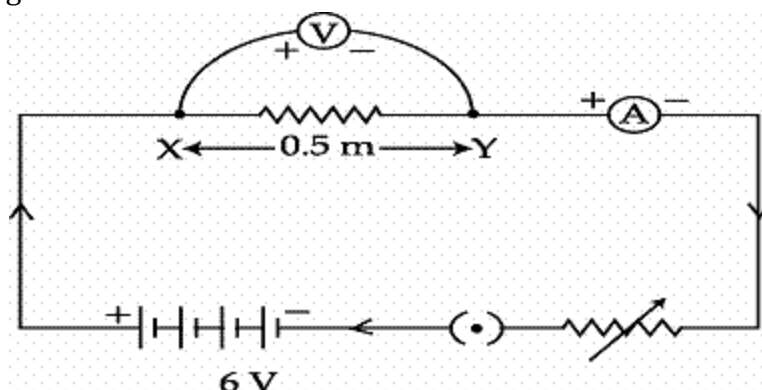
- (a) On increasing the current flowing through the coil, the field will increase.
- (b) On reversing the direction of current through the coil, the direction of the field will reverse.
- (c) On increasing the number of turns in the coil, the field will increase.

17.Ans.

- (a) The glottis is covered by a small cartilaginous flap of skin called the epiglottis which prevents the entry of food particles into the wind pipe while swallowing.
- (b) The lung alveoli are richly supplied with blood capillaries for the exchange of gases. From the thin walls of alveoli, oxygen diffuses into blood and is supplied to the tissues, while carbon dioxide is absorbed by blood from the tissues and is carried to the alveoli of the lungs for exhalation.
- (c) The walls of the trachea are supported by C-shaped cartilage rings which allow the trachea to collapse in the presence of less air in it.

18.Ans.

(a) Circuit Diagram



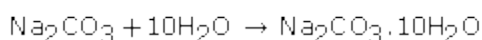
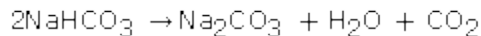
(b) Ohm's law: The potential difference V across the ends of a given metallic wire in an electric circuit is directly proportional to the current flowing through it provided its temperature remains the same.

19.Ans.

(a) The chemical name of washing soda is sodium carbonate decahydrate.

Its formula is $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$.

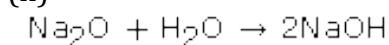
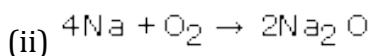
It is obtained by heating baking soda and then recrystallisation.



(b) Distilled water is a pure form of water and is devoid of any ionic species. Therefore, it does not conduct electricity. Rain water, being an impure form of water, contains many ionic species such as acids, and therefore, it conducts electricity.

20.Ans.

(i) Metal-sodium

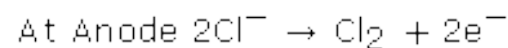
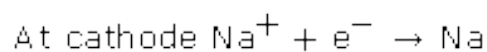


(iii) Electrolysis of molten sodium chloride (NaCl) is the process.

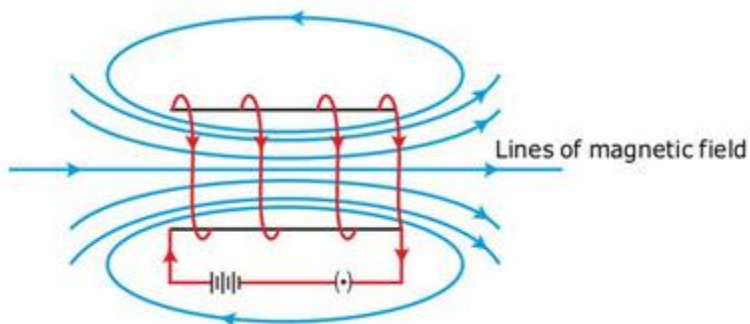
At cathode (–vely charged electrode) \rightarrow Na is deposited.

At Anode (+vely charged electrode) \rightarrow Cl_2 is liberated.

i.e. we can write:



21.Ans. A coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder is called a solenoid.



The field lines inside the solenoid are in the form of parallel straight lines. This indicates that the magnetic field is the same at all the points inside the solenoid.

USE: A strong magnetic field produced inside a solenoid can be used to magnetise a piece of magnetic material, such as soft iron, when placed inside the coil.

22.Ans.

(a)

- (i) Right-hand thumb rule: Imagine that you are holding a current-carrying straight conductor in your right hand such that the thumb points towards the direction of the current, then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field.
- (ii) Fleming's left-hand rule: Stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular. If the first finger points in the direction of the magnetic field and the second finger in the direction of the current, then the thumb will point in the direction of motion or the force acting on the conductor.
- (iii) Fleming's right-hand rule: Stretch the thumb, forefinger and middle finger of your right hand so that they are perpendicular to each other. If the forefinger indicates the direction of the magnetic field and the thumb shows the direction of motion of the conductor, then the middle finger will show the direction of induced current.

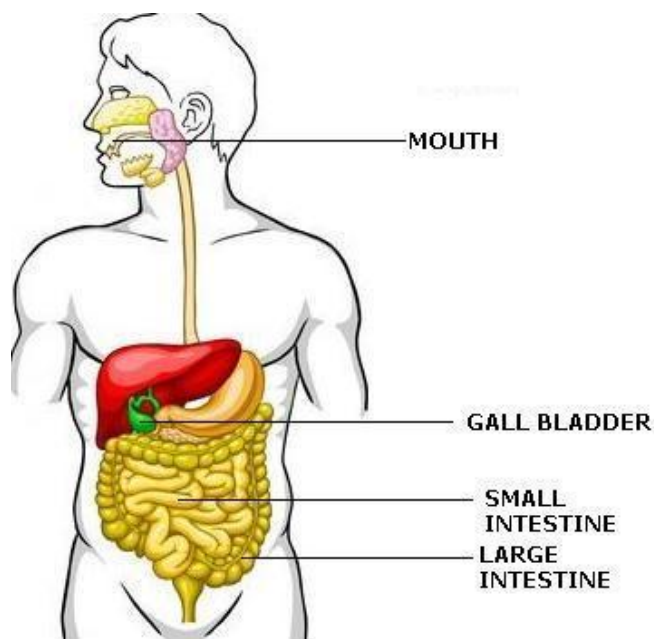
(b) Two safety measures commonly used in domestic electric circuits and appliances are

- (i) Provision of electric fuse
- (ii) Earthing of metal bodies of electrical appliances

23.Ans.

(a) Diagram of the human alimentary canal:

- (i) Part in which starch digestion starts: Mouth
- (ii) Part in which bile is stored: Gall bladder
- (iii) Part in which nutrients are absorbed: Small intestine
- (iv) Part in which water is absorbed: Large intestine



(b) Role of hydrochloric acid in the stomach: It kills bacteria in the stomach and also provides an acidic medium for the action of pepsin.

(c)

- (i) Gastric sphincter: It controls the release of food from the stomach to the small intestine.
- (ii) Anal sphincter: It controls the release of undigested waste from the rectum through the anus.

24.Ans.

(a) The steps which take place in chloroplasts during photosynthesis are

- (i) Absorption of sunlight energy by chlorophyll.
- (ii) Conversion of light energy into chemical energy and the splitting of water into hydrogen and oxygen by light energy.
- (iii) Reduction of carbon dioxide by hydrogen to form carbohydrate (glucose) by utilising chemical energy.

(b) The opening and closing of stomata is controlled by guard cells. When water flows into the guard cells, they swell, become curved and cause the stomata to open. When the guard cells lose water, they shrink, become straight and close the stomata.

(c) Carbon dioxide is made available to plants when stomata are open.

SECTION B

25.Ans. A (i) and (ii)

26.Ans. D. Dilute hydrochloric acid

27.Ans. B. Litmus paper

28.Ans. B. Both (ii) and (iii). The positions of the voltmeter and ammeter should be exchanged.

29.Ans. B. Student II only. Because $V \propto I$ when V is zero, I is zero. So, student II's graph is correct.

30.Ans. C. 1.0 A in both circuits. In both the circuits, equivalent resistance is 4.5 ohm.
So, $I = V/R = 4.5/4.5 = 1.0$ A

31.Ans. B. The voltmeter and the resistor are connected in parallel.

32.Ans. C. A healthy destarched potted plant.

33.Ans. C. 3 represents chloroplast which is located in guard cells represented by 2. While 4 is stomatal pore and 1 is epidermis.

34.Ans. A well-stained leaf peel preparation would show epidermal cells, stomata and guard cells, each with one nucleus and many chloroplasts.

35.Ans. Iron displaces copper from copper sulphate. Hence, a reddish brown Cu deposit can be observed on iron nails when these are kept in an aqueous solution of CuSO_4 .

36.Ans.

(i) Slope of the I-V graph gives the reciprocal of the resistance.

$$R = V/I$$

$$\text{Hence, } 1/R = I/V = 0.4/4.0 = 0.1$$

$$\text{So, } R = 1/0.1 = 10 \, \Omega$$

(ii) When voltage is increased, the current also increases as $V \propto I$. So, R remains constant, i.e. the slope does not change.