10th Science Oswaal Sample Paper 02(CBSE 2020)

SECTION-01

1. How does valency of an element vary across a period ? 1

OR

Write two reasons responsible for late discovery of noble gases.

2. Name the type of particles which acts as a prism in the formation of rainbow in the sky ? 1
3. Which is a stronger acid, with pH = 5 or with pH = 2 ? 1
4. Give reason for the statement–Since the ovary releases one egg every month, the uterus also prepares itself every month by making its lining thick and spongy. 1
5. Name the method by which Spirogyra reproduces under favourable conditions. Is this method sexual or asexual ? 1

OR

In a germinating seed, which parts are known as future shoot and future root ? 1

6. Define angle of incidence and angle of refraction. 1
7. Name the type of particles which acts as a prism in the formation of rainbow in the sky. 1
8. Through which of the two wires, the electric current will flow more easily : (i) a thick wire or (ii) a thin wire of the same material, and of the same length when connected to the same source ? 1
9. In the double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate ?

(a) Lead sulphate (insoluble) (b) Lead acetate
(c) Ammonium nitrate (d) Potassium sulphate 1

10. Which of the following statements are usually correct for carbon compounds ? These

(i) are good conductors of electricity
(ii) are poor conductors of electricity
(iii) have strong forces of attraction between their molecules
(iv) do not have strong forces of attraction between their molecules

(a) (i) and (iii) (b) (ii) and (iii)
(c) (i) and (iv) (d) (ii) and (iv) 1

OR

A molecule of ammonia (NH_3) has

(a) only single bonds (b) only double bonds
(c) only triple bonds (d) two double bonds and one single bond 1

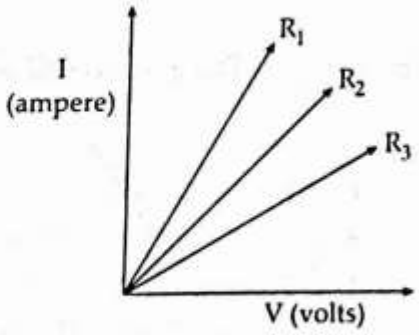
11. In an electrical circuit two resistors of 2 Ω and 4 Ω, respectively are connected in series to a 6 V battery. The heat dissipated by the 4 Ω resistor in 5 s will be :

(a) 5 J. (b) 10 J.
(c) 20 J. (d) 30 J.

12. A student carries out an experiment and plots the V-I graph of three samples of nichrome wire with resistances R_1, R_2 and R_3 respectively. Which of the following is true ?

(a) $R_1 = R_2 = R_3$ (b) $R_1 > R_2 > R_3$

(c) $R_3 > R_2 > R_1$ (d) $R_2 > R_3 > R_1$



13. Commercial electric motors do not use

(a) an electro-magnet to rotate the armature.

(b) effectively large number of turns of conducting wire in the current carrying coil.

(c) a permanent magnet to rotate the armature.

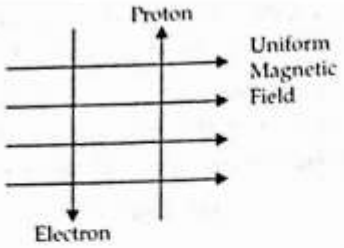
(d) a soft iron core on which the coil is wound. 1

OR

A uniform magnetic field exists in the plane of paper pointing from left to right as shown in Figure. In the field an electron and a proton move as shown. The electron and the proton experience :

(a) forces both pointing into the plane of paper.

(b) forces both pointing out of the plane of paper.



(c) forces pointing into the plane of paper and out of the plane of paper, respectively.

(d) forces pointing opposite and along the direction of the uniform magnetic field, respectively. 1

Directions : For question numbers 14 and 16, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below :

(a) Both A and R are true and R is correct explanation of the assertion.

(b) Both A and R are true but R is not the correct explanation of the assertion.

(c) A is true but R is false.

(d) A is false but R is true

14. **Assertion (A) :** Rainbow formation in the sky takes place during rainfall.
Reason (R) : Rainbow formation is due to dispersion of light and internal reflection. 1

15. **Assertion (A) :** Bending a wire does not affect electrical resistance.
Reason (R) : Resistance of wire is proportional to resistivity of material. 1

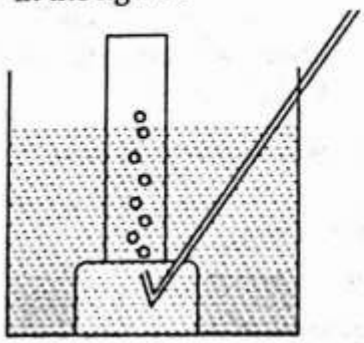
16. **Assertion (A) :** Metals are sonorous.
Reason (R) : They are generally brittle in the solid state; they break into pieces when hammered. 1

OR

Assertion (A) : Ionic compounds are solid and hard.
Reason (R) : They have strong force of attraction between positive and negative ions.

Directions : Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four sub-parts.

17. A metal is treated with dilute sulphuric acid. The gas evolved is collected by the method shown in the figure :



(a) Identify the gas.
(i) Hydrogen gas (ii) Carbon dioxide gas
(iii) Nitrogen gas (iv) Sulphur dioxide gas

(b) Which of the following statement is correct about the gas ?
(i) It is soluble in water. (ii) It is heavier than air.
(iii) It is insoluble water. (iv) Both (ii) and (iii)

(c) How will you test for the gas evolved ?
(i) Bring a glowing splint near test tube, it will reignite.
(ii) Bring moist litmus paper is placed in a test tube of this gas, it turns red.
(iii) Bring a burning splint near the opening of a test tube containing this gas, a popping sound occurs.
(iv) Using universal litmus solution

(d) If the metal used above is zinc then the chemical equation for the evolution of gas is :
(i) $Zn(s) + H_2SO_4(dil) \rightarrow ZnSO_4(aq) + H_2(g)\uparrow$
(ii) $2Zn(s) + H_2SO_4(dil) \rightarrow 2ZnSO_4(aq) + H_2(g)\uparrow$
(iii) $Zn(s) + 2H_2SO_4(dil) \rightarrow ZnSO_4(aq) + 2H_2(g)\uparrow$
(iv) $2Zn(s) + 2H_2SO_4(dil) \rightarrow 2ZnSO_4(aq) + 2H_2(g)\uparrow$

(e) An industrial use of the gas evolved is:
(i) In paints and varnishes
(ii) In making of gold jewellery
(iii) To join railway tracks or cracked machine parts
(iv) As fuel in rockets

1+1+1+1

18. Read the passage and answer the following questions ?

Some experiments were carried out using *Croton* sp. plants to understand the process of photosynthesis. It was observed that the leaves of the plant exposed to light for longer duration accumulated more starch. However, due to presence of pre-formed starch in the leaves, it was difficult to find the net productivity on a fixed exposure to light source. Therefore, it was necessary to obtain starch free leaves in the plant before starting the experiment.

(a) Which of the following would help obtain starch free leaves in the plant ?
(i) Expose the leaves to blue light for 48 hours before starting the experiment.
(ii) Keep the plant in dark for about 48 hours before starting the experiment.
(iii) Remove starch from the leaves by exosmosis, 48 hours before starting the experiment.
(iv) Keep the leaves to red light for 48 hours before starting the experiment.

(b) After a period of illumination, the leaves were boiled in alcohol to make them colourless. Which of the following could be used to test the end product stored in the leaves ?
(i) Cobalt chloride paper (ii) Litmus paper
(iii) Iodine solution (iv) Copper sulfate solution

(c) Some of the starch free leaves were coated with wax on both the surfaces. The plant was maintained under normal environmental conditions. At the end of the experiment, the wax coated leaves are likely to show _____.

(i) Accumulation of more water.

(ii) Wilting of the wax coated leaves.

(iii) Increase in sucrose accumulation.

(iv) Decrease in number of chloroplasts

(d) During the morning hours, using a fine blade, an incision was made to the leaves such that the phloem tissue was cut open. Analysis of the liquid oozing out was found to contain high amount of :

(i) Xylose (ii) Ribose

(iii) Sucrose (iv) Galactose

(e) Why plants coated with vaseline or wax do not remain healthy for a long time? Give any two reasons. 4

19. The following diagram displays a chemical reaction. Observe carefully and answer any four questions.

(a) The type of chemical reaction that will take place is

(i) Photochemical decomposition (iii) Reduction reaction

(ii) Displacement reaction (iv) Combination reaction

(b) What happens to the silver chloride?

(i) Silver chloride changes to grey in colour. (iii) Silver chloride solidifies.

(ii) Silver chloride changes to white in colour (iv) None of these

(c) Write the chemical equation of the reaction involved.

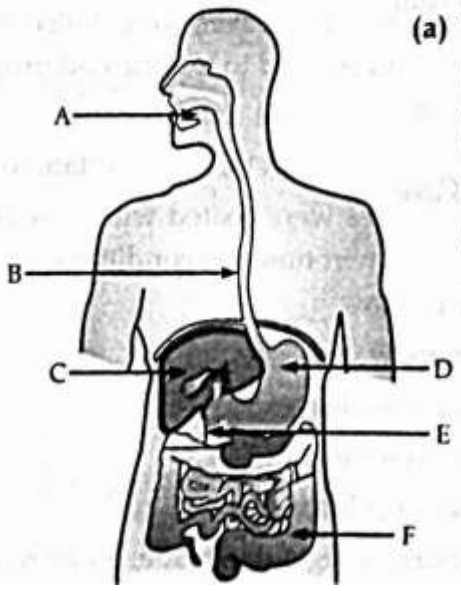
(d) One of the commercial use of this salt is

(i) In paints and varnishes (ii) In black and white photography

(iii) In heating devices (iv) As fuel in rockets

(e) Why do silver articles become black after sometime when exposed to air ? 4

20. The given diagram is of human digestive system. Study the diagram and answer any four



(a) Which of these correctly represent the labels B, C, D and E?

(i) B- Oesophagus, C- Liver, D- Stomach, E- pancreas

(ii) B- Pancreas, C- Oesophagus, D- Liver, E- Stomach

(iii) B- Stomach, C- Pancreas, D- Oesophagus, E- Liver

(iv) B- Liver, C- Stomach, D- Pancreas, E- Oesophagus

(b) The secretion that is released by label C is :

(i) Bile (ii) Pepsin

(iii) Saliva (iv) Gastric juice

(c) How it helps in fat digestion ?

(d) The digestion of food starts in

(i) A (ii) D

(iii) E (iv) F

(e) In case of diarrhea, which major process does not takes place normally in region F?

(i) Absorption of food (ii) Absorption of water

(iii) Secretion of hormones (iv) Removal of waste material

SECTION-B

21. A student added few pieces of aluminium metal to two test tubes A and B containing aqueous solutions of iron sulphate and copper sulphate. In the second part of her experiment, she added iron metal to another test tubes C and D containing aqueous solutions of aluminium sulphate and copper sulphate. In which test tube or test tubes will she observe colour change ? On the basis of this experiment, state which one is the most reactive metal and why. 2

OR

Arrange the metals iron, magnesium, zinc and copper in the increasing order of their reactivity. What will be the two made by the student when iron filings are added to sulphate solution ? 2

22. How do guard cells regulate opening and closing of stomatal pores ? 2

23. The refractive indices of glass and water with respect to air are $\frac{3}{2}$ and $\frac{4}{3}$ respectively. If speed of light in glass is 2×10^8 m/s, find the speed of light in water. 2

24. List two properties of the images formed by convex mirrors. Draw ray diagram in support of your answer. 2

OR

Why spectrum is formed when white light is passed through a glass prism ? 2

25. State the factors on which at a given temperature the resistance of a cylindrical conductor depends. State the SI unit of resistivity. 2

26. Why must we conserve our forest ? List two factors responsible for causing deforestation. 2

SECTION-C

27. (i) Write two observations when lead nitrate is heated in a test tube ?

(ii) Name the type of reaction ?

(iii) Write a balanced chemical equation to represent the above reaction ? 3

28. Name any two elements of group one and write their electronic configurations ? What similarity do you observe in their electronic configurations ? Write the formula of oxide for any of the above said element. 3

OR

An element 'X' has mass number 35 and number of neutrons 18. Write atomic number and electronic configuration of 'X'. Also write group number, period number and valency of 'X'. 3

29. What is carpel ? Write the function of its various parts. 3

30. In human beings, the statistical probability of getting either a male or a female child is 50%. Give reasons and explain with the help of a diagram ? 3

31. An object of height 5 cm is placed perpendicular to the principal axis of a concave lens of length 10 cm. If the distance of the object from the optical centre of the lens is 20 cm, determine the position, nature and size of the image formed using the lens formula.

32. Name, state and explain with an example the rule used to determine the direction of force experienced by a current carrying conductor placed in a uniform magnetic field ? 3

33. (i) Create a terrestrial food chain depicting four trophic levels.

(ii) Why do we not find food chains of more than four trophic levels in nature ? 3

34. Write balanced chemical equations for the following statements :

(i) Bleaching powder is kept open in air.

(ii) Blue crystals of copper sulphate are heated.

(iii) Chlorine gas is passed through dry slaked lime.

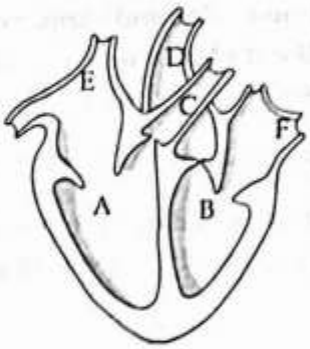
(iv) Carbon dioxide gas is passed through lime water.

(v) NaOH solution is heated with zinc granules. 5

OR

Write the chemical name of $Na_2CO_3.10H_2O$ and Na_2CO_3 ? Write the significance of $10H_2O$? Mention the term used for water molecules attached with a salt ? With the help of a chemical equation, explain the method of preparation of both $Na_2CO_3.10H_2O$ and Na_2CO_3 ? Also, list two uses of $Na_2CO_3.10H_2O$. 5

35. (i) Identify any two parts from the given diagram which carry oxygenated and deoxygenated blood ?



(ii) Explain the process of double circulation with the help of a flow chart ? 5

36. (i) What is meant by potential difference ? State its SI unit.

(ii) Name a device that helps to maintain a potential difference across a conductor ?

(iii) Calculate : (a) the highest, (b) the lowest resistance that can be obtained by the combination of four coils of resistances 4Ω, 8Ω, 12Ω and 24Ω ? 5

OR

(a) Two identical resistors each of resistance 10 ohm are connected in : (i) Series, (ii) Parallel. in turn to a battery of 6V. Calculate the ratio of power consumed by the combination of resistor in the two cases.

(b) List two factors on which the resistance of a conductor depends ?

(c) Write a difference between an ammeter and voltmeter ? 5