



CBSE

Class X Science Sample Paper 4

TIME: 3 hrs

M.M.= 80

General Instructions:

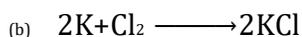
- The question paper comprises five sections – A, B, C, D and E. You are to attempt all the sections.
- All questions are compulsory.
- Internal choice is given in sections B, C, D and E.
- Question numbers 1 and 2 in Section A are one mark questions. They are to be answered in one word or in one sentence.
- Question numbers 3 to 5 in Section B are two marks questions. These are to be answered in about 30 words each.
- Question numbers 6 to 15 in Section C are three marks questions. These are to be answered in about 50 words each.
- Question numbers 16 to 21 in Section D are five marks questions. These are to be answered in about 70 words each.
- Question numbers 22 to 27 in Section E are based on practical skills. Each question is a two marks question. These are to be answered in brief.

Section A

1. Which plant hormone promotes dormancy of seeds? (1)
2. Name the energy of water which is used in hydroelectric power plants. (1)

Section B

3. Which of the following is a combination reaction and which is a displacement reaction? (2)



OR

Why do we consider a neutralisation reaction to be an example of double displacement?

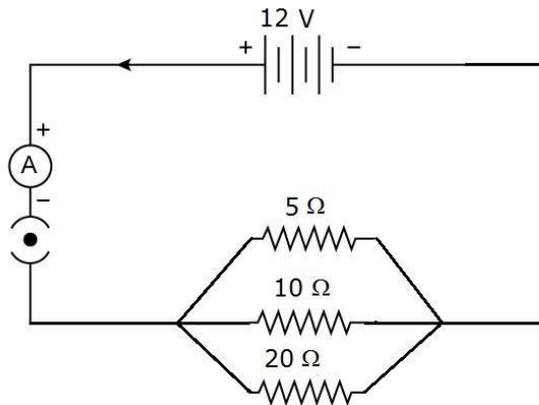
4. If you take five mice and remove their tails by surgery, will the tailless mice have tailless progeny? Give reason for your answer. (2)
5. The speed of light in air is 3×10^8 m/s and the speed of light in water is 2.26×10^8 m/s. Calculate the refractive index of water. (2)

Section C

6. (3)
- (a) Draw a schematic labelled diagram of a domestic wiring circuit which includes
- (i) A main fuse
 - (ii) A power meter
 - (iii) One light point
 - (iv) A power output socket
- (b) Why is copper wire not suitable for use as a fuse wire?
7. What do you call the secretion of the stomach? How does the wall of the stomach protect itself from the action of highly acidic HCl? (3)
8. Identify different types of the following reactions. (3)
- (i) $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{NaNO}_3(\text{aq})$
- (ii) $\text{CaO}(\text{s}) + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2(\text{aq})$
- (iii) $\text{KClO}_3(\text{s}) \longrightarrow 2\text{KCl}(\text{s}) + 3\text{O}_2(\text{g})$
9. $\text{Cu} + \text{AgNO}_3 \rightarrow \text{CuNO}_3 + \text{Ag}$
 $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$
 $\text{Zn} + \text{FeSO}_4 \rightarrow \text{ZnSO}_4 + \text{Fe}$
From the above information arrange the given metals in the increasing order of reactivity. Give reason for your choice. (3)
- OR
- What is thermite reaction? How is it used to join the railway tracks or cracked machine parts? Explain with the help of an example.
10. A blue-flowered plant denoted by BB is crossbred with a white-flowered plant denoted by bb. (3)
- (a) State the colour of the flowers you would expect in the F_1 generation plants.
- (b) What must be the percentage of white-flowered plants in the F_2 generation if flowers of F_1 plants are self-pollinated?

(c) State the expected ratio of the genotypes BB and Bb in the F₂ progeny.

11. In the circuit given below, three resistors of 5 Ω , 10 Ω and 20 Ω , respectively, are connected across a battery of 12 V. (3)



Calculate:

- Current through the 5 Ω and 20 Ω resistors
- Total current in the circuit if another resistor of 15 Ω is connected
- Compare the resistance of the three resistors connected in series

OR

An electrical appliance is rated 220 V–1kW. What is the resistance of the appliance?
If three such appliances run simultaneously for 6 hours, what is the energy consumed?
Calculate the cost of running these appliances if the per unit cost is Rs5.20.

12. What do you mean by ozone depletion? Mention the cause of ozone depletion in brief. (3)

OR

What is biological magnification? Will the levels of this magnification be different at different levels of the ecosystem? Where will the magnification be maximum?

13. Farmers use a large number of pesticides and fertilisers in their fields to increase crop production and to enhance their profits. By doing so they are causing damage to the soil as well as to the environment. Do you agree with this statement? Why should we avoid eating fruits and vegetables without washing them properly? What values do you get from this? (3)

14. Answer the following: (3)

- What is the advantage of having two eyes instead of one?
- Explain the function of the iris.
- What is the difference in the defect of a person wearing spectacles of +1 D to a person wearing spectacles of –1 D?

15. Answer the following: (3)

- a. What change will you observe in the colour of red litmus paper when it is dipped into a solution of sodium sulphate? Give reason to explain your observation.
- b. A bottle filled with concentrated sulphuric acid up to the brim is left open in the atmosphere by mistake. Will there be any change in the level of liquid? Explain your answer with reason. **Section D**

16. (a) Define magnetic field lines and write their characteristics. (5)
 (b) State the direction of magnetic field lines with a neat labelled diagram.
 (c) Is the magnetic field same all around a bar magnet? Explain with reasons.

17. A quiz contest was being held in the school for chemistry students. The quiz-master said (5)

An element has the electronic configuration 2, 8, 2.

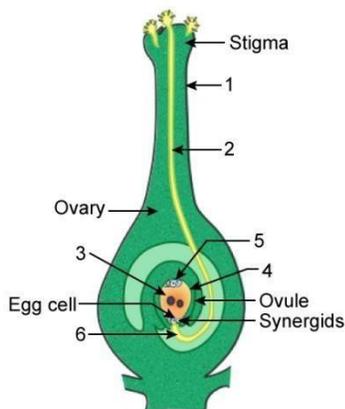
- What is the atomic number of this element?
- Is it a metal, non-metal or metalloid?
- Which of the elements Mg, O, P or Ar shows similarity with this element?
- We use a compound of this element in our food. Identify that compound.
- A compound of this element causes hardness of water. Identify that compound.

OR

- State the Modern Periodic Law. How have the elements been arranged in the modern periodic table? Why is it considered that the position of hydrogen in the periodic table is anomalous?
- An element X (2, 8, 2) combines separately with NO_3^- and $(\text{PO}_4)^{3-}$ radicals. Write the formulae of the compounds so formed. To which group of the periodic table does the element 'X' belong? Will it form covalent or ionic compounds with these radicals? How?

18. Briefly explain Darwin's theory of evolution. (5) OR

Study this diagrammatic representation of the process of fertilisation, and answer the questions which follow: (5)



- Name the parts labelled 1, 2, 3, 4, 5 and 6.
- What happens to the ovary and the ovule after fertilization?

- (c) What is the function of the synergids?
 (d) What part does the stigma play in the process of fertilization?

19. An organic compound 'C' (molecular formula $C_2H_4O_2$) reacts with sodium metal to form a compound 'R' and evolves a gas which burns with a pop sound. Compound 'C' on treatment with alcohol 'A' in the presence of an acid forms a sweet-smelling compound 'S' (molecular formula $C_3H_6O_2$). Addition of NaOH to 'C' also gives 'R' and water. 'S' on treatment with NaOH solution gives back 'R' and 'A'. Identify 'C', 'R', 'A' and 'S', and write the reaction involved. (5)

20.

- (a) What will happen to your throat when you sleep with your mouth open, especially when your nasal passages are plugged as a result of cold? (2)
 (b) Why does a person who breathes rapidly and deeply for several seconds experience a short period of time in which respiration does not occur before normal breathing resumes? (3)

21. With a neat labelled diagram, enlist the new sign convention for spherical mirrors. (5)

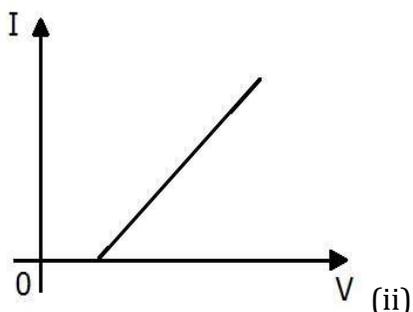
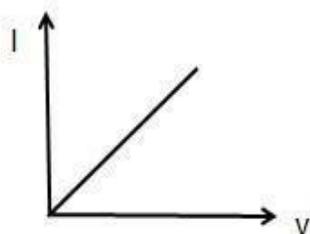
OR

- (a) Which gas is filled in an electric bulb and why?
 (b) What do you mean by resistance of a conductor? On what factors do the resistance of a conductor depend and how? Write the SI unit of resistance.
 (c) State Ohm's law.

Section E

24. What change will you observe in the colour of red litmus paper when it is dipped into a solution of sodium carbonate? Give reason to explain your observation. (2)

25. Identify and explain with reason which of the following graphs (i) and (ii) is a correct representation of Ohm's law. (2)



(i)

26.

(a) Why is the proportion of CO_2 more in exhaled air? (2)

(b) Why is the proportion of nitrogen gas same in inhaled as well as exhaled air?

27. From a bunch of mirrors and lenses of different kinds, how will you choose one concave mirror and one convex lens? (2)

OR

Radhika is provided with water, glass and carbon disulphide. She is asked to choose the substance through which light will travel the fastest. Which substance must she choose? Give reason for your answer. Consider the refractive indices of water, glass and carbon disulphide as 1.33, 1.53 and 1.63, respectively.